

BP-18 Rate Proceeding

Initial Proposal

Power Revenue Requirement Study

BP-18-E-BPA-02

November 2016



POWER REVENUE REQUIREMENT STUDY

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COMMONLY USED ACRONYMS AND SHORT FORMS

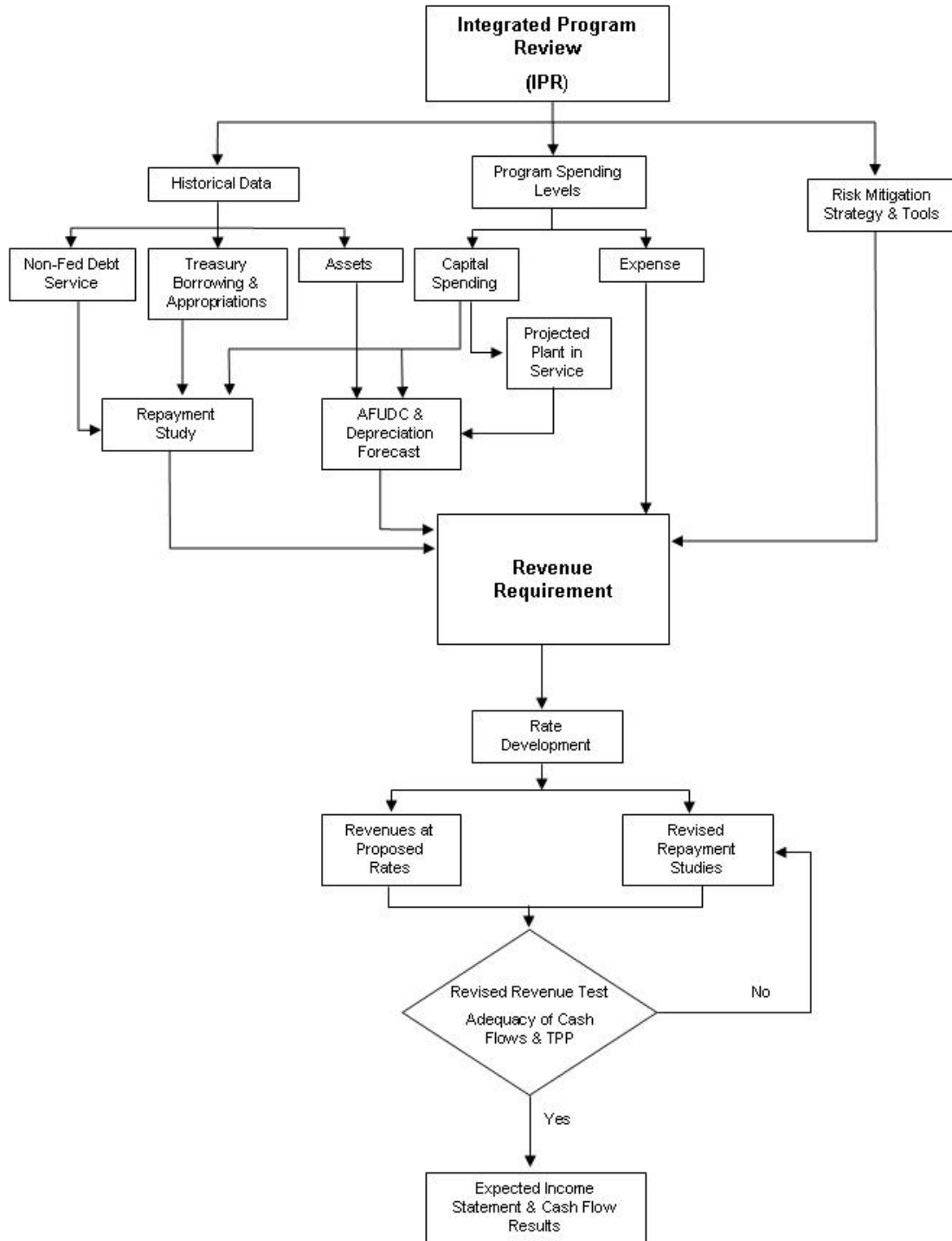
ACNR	Accumulated Calibrated Net Revenue
ACS	Ancillary and Control Area Services
AF	Advance Funding
aMW	average megawatt(s)
ANR	Accumulated Net Revenues
ASC	Average System Cost
BAA	Balancing Authority Area
BiOp	Biological Opinion
BPA	Bonneville Power Administration
Btu	British thermal unit
CDQ	Contract Demand Quantity
CGS	Columbia Generating Station
CHWM	Contract High Water Mark
CNR	Calibrated Net Revenue
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)
DD	Dividend Distribution
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
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	National Marine Fisheries Service (NMFS) Federal Columbia River
Power System (FCRPS) Biological Opinion (BiOp)	
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.
OS	Oversupply
OY	operating year (August through July)
PDCI	Pacific DC Intertie
Peak	Peak Reliability (assessment/charge)
PF	Priority Firm Power
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
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)
RCD	Regional Cooperation Debt
RD	Regional Dialogue
REC	Renewable Energy Certificate
Reclamation	U.S. Bureau of Reclamation
RDC	Reserves Distribution Clause
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 **1. INTRODUCTION**

2

3 **1.1 Purpose of Study**

4 The purpose of the Power Revenue Requirement Study (Study) is to establish the revenues from
5 wholesale power rates and other power sales and services that are necessary to recover, in
6 accordance with sound business principles, the Federal Columbia River Power System (FCRPS)
7 costs associated with the production, acquisition, marketing, and conservation of electric power.

8 The revenue requirement developed in this Study includes recovery of the Federal investment in
9 hydro generation, fish and wildlife, and conservation costs; Federal agencies’ operations and
10 maintenance (O&M) expenses allocated to power; capitalized contract expenses associated with
11 non-Federal power suppliers, such as Energy Northwest (EN); other power purchase expenses,
12 such as short-term power purchases; power marketing expenses; cost of transmission services
13 necessary for the sale and delivery of FCRPS power; and all other generation-related costs
14 incurred by the Administrator pursuant to law.

15

16 The cost evaluation period, as defined by the Federal Energy Regulatory Commission
17 (Commission), is the period extending from the last year for which historical information is
18 available through the proposed rate period. The cost evaluation period for this rate filing
19 includes fiscal year (FY) 2017 and the proposed rate period, FY 2018–2019. This Study is based
20 on generation revenue requirements that include the results of generation repayment studies.

21 This Study does not include the revenue requirement or a cost recovery demonstration for
22 Bonneville Power Administration’s (BPA) transmission function. *See* Transmission Revenue
23 Requirement Study, BP-18-E-BPA-09.

1 This Study outlines the policies, forecasts, assumptions, and calculations used to determine the
2 generation revenue requirement. The Power Revenue Requirement Study Documentation,
3 BP-18-E-BPA-02A, contains key technical assumptions and calculations, the results of the
4 generation repayment studies, and further explanation of the repayment program and its outputs.

5
6 The revenue requirement for this Study is developed using a cost accounting analysis comprised
7 of three parts. First, repayment studies for the generation function are prepared to determine the
8 schedule of amortization payments and to project annual interest expense for bonds and
9 appropriations that fund the Federal investment in hydro generating resources, fish and wildlife
10 recovery, conservation, and other generation assets. Repayment studies are conducted for each
11 year of the rate period and extend over the 50-year repayment period. Second, generation
12 operating expenses and Minimum Required Net Revenues (MRNR) are projected for each year
13 of the rate period. Third, annual Planned Net Revenues for Risk (PNRR) are determined after
14 taking into account risks, BPA's cost recovery goals, and other risk mitigation measures, as
15 described in the Power and Transmission Risk Study, BP-18-E-BPA-05. From these three steps,
16 the revenue requirement is set at the revenue level necessary to fulfill cost recovery requirements
17 and objectives. This process is depicted in Figure 1. Once the revenue requirement is
18 completed, the costs identified in it are passed to the rate development process, where they are
19 allocated to the appropriate cost pools and used to develop rates in the Power Rates Study (PRS),
20 BP-18-E-BPA-01.

21
22 Consistent with Department of Energy (DOE) Order RA 6120.2 and the standards on review of
23 BPA's rates applied by the Commission, BPA must demonstrate the adequacy of both current

1 and proposed rates. BPA conducts a current revenue test to determine whether revenues
2 projected from current rates meet cost recovery requirements for the rate period and the
3 repayment period. If the current revenue test indicates that cost recovery and risk mitigation
4 requirements are met, current rates could be extended through the proposed rate approval period.
5 The current revenue test, described in section 3.2 of this Study, demonstrates that revenues from
6 current rates will not recover the generation revenue requirement for the rate period.

7
8 The revised revenue test, which is performed after calculation of the proposed power rates,
9 determines whether projected revenues from proposed rates meet cost recovery requirements and
10 objectives for the rate test and repayment periods. The revised revenue test, described in
11 section 3.3 of this Study, demonstrates that revenues from the proposed power rates will recover
12 generation costs in the rate period and over the ensuing 50-year repayment period. In addition,
13 revenues from the proposed rates, together with risk mitigation tools, are sufficient to meet
14 BPA's 95 percent Treasury Payment Probability (TPP) standard that all U.S. Treasury payments
15 will be paid on time and in full, as discussed in the Power and Transmission Risk Study, BP-18-
16 E-BPA-05.

17
18 Table 1 summarizes the revised revenue test and shows projected net revenues from proposed
19 power rates for FY 2018–2019. These net revenues are the lowest level necessary to achieve
20 BPA's cost recovery objectives, when combined with other risk mitigation tools, given hydro
21 condition uncertainty, market price volatility, and other risks.

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

3 4 **1.2 Legal Requirements**

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

9 10 **1.2.1 Governing Authorities**

11 BPA’s revenue requirements are governed primarily by four legislative acts: the Bonneville
12 Project Act of 1937, Pub.L. No. 75-329, 50 Stat. 731; the Flood Control Act of 1944, Pub.L.
13 No. 78-534, 58 Stat. 890, amended 1977; the Federal Columbia River Transmission System Act
14 (Transmission System Act) of 1974, Pub.L. No. 93-454, 88 Stat. 1376; and the Pacific Northwest
15 Electric Power Planning and Conservation Act (Northwest Power Act), Pub.L. No. 96-501,
16 94 Stat. 2697. The Omnibus Consolidated Rescissions and Appropriations Act of 1996, Pub.L.
17 No. 104-134, 110 Stat. 1321, also guides the development of BPA’s revenue requirements.
18 DOE Order “Power Marketing Administration Financial Reporting,” RA 6120.2, issued by the
19 Secretary of Energy, provides guidance to Federal power marketing administrations regarding
20 repayment of the Federal investment. In addition, policies issued by the Commission provide
21 guidance on separate accounting for transmission system costs. *See, e.g., Bonneville Power*
22 *Admin.*, 25 FERC ¶ 61,140 (1983).

1 **1.2.1.1 Legal Requirements Governing BPA’s Revenue Requirement**

2 BPA’s rates must be set to ensure that revenues are sufficient to recover costs. This requirement
3 was first set forth in section 7 of the Bonneville Project Act, 16 U.S.C. § 832f (as amended
4 1977), which provides that:

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

10
11 This cost recovery principle was repeated for Army reservoir projects in section 5 of the Flood
12 Control Act of 1944, 16 U.S.C. § 825s. In 1974, section 9 of the Transmission System Act,
13 16 U.S.C. § 838g, expanded the cost recovery principle so that BPA’s rates also would be set to
14 recover:

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

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

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

15
16 Section 7(a)(2) of the Northwest Power Act, 16 U.S.C. § 839e(a)(2), provides that the
17 Commission shall issue a confirmation and approval of BPA's rates upon a finding that the rates

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

21 (B) are based upon the Administrator's total system costs; and
22
23

1 (C) insofar as transmission rates are concerned, equitably allocate the costs of
2 the Federal transmission system between Federal and non-Federal power
3 utilizing such system.
4

5 Development of the revenue requirement is a critical component of meeting the statutory cost
6 recovery principles relevant to BPA. The costs associated with the FCRPS and associated
7 services and expenses, as well as other costs incurred by the Administrator in furtherance of
8 BPA's mission, are included in this Study.
9

10 **1.2.1.2 The BPA Appropriations Refinancing Act**

11 BPA's power rates for the FY 2018–2019 rate period will reflect the requirements of the
12 Refinancing Act, 16 U.S.C. § 8381, part of the Omnibus Consolidated Rescissions and
13 Appropriations Act of 1996, Pub.L. No. 104-134, 110 Stat. 1321, enacted in April 1996. The
14 Refinancing Act required that unpaid principal on BPA appropriations (“old capital
15 investments”) at the end of FY 1996 be reset at the present value of the principal and annual
16 interest payments BPA would make to the U.S. Treasury for these obligations absent the
17 Refinancing Act, plus \$100 million. 16 U.S.C. § 8381(b). The Refinancing Act also specified
18 that the new principal amounts of the old capital investments be assigned new interest rates from
19 the Treasury yield curve prevailing at the time of the refinancing transaction. 16 U.S.C.
20 § 8381(a)(6)(A).
21

22 The Refinancing Act restricted prepayment of the new principal for old capital investments to
23 \$100 million during the first five years after the effective date of the financing. 16 U.S.C.

1 § 8381(e). The Refinancing Act also specifies that repayment dates on new principal amounts
2 may not be earlier than the repayment dates for old capital investments. 16 U.S.C. § 8381(d).
3 The Refinancing Act further directs the Administrator to offer to provide assurance in new or
4 existing contracts for power, transmission, and related services that the Federal Government will
5 not increase the repayment obligations in the future. 16 U.S.C. § 8381(i).

7 **1.2.1.3 Allocation of FCRPS Costs**

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

12
13 For projects that provide power generation to the FCRPS, this allocation has generally been
14 accomplished pursuant to statutory direction. For example, section 7 of the Bonneville Project
15 Act, 16 U.S.C. § 832f, requires that BPA's rates be based on, *inter alia*, "an allocation of costs
16 made by the [Secretary of Energy,]" and, insofar as costs of the Bonneville Project are
17 concerned:

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

22 *Id.*

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

6
7 In general, an attempt is made to allocate the cost of each feature of a multipurpose dam to the
8 purpose it serves. For example, the costs of powerhouses, penstocks, and other specific
9 power-related facilities have been allocated to the generation function, whereas the costs of
10 navigation locks have been allocated to navigation. More problematic are the joint-use costs that
11 remain unallocated after the costs identifiable to single purposes have been allocated. The
12 joint-use formulas approximate the relative benefits provided by each function, and costs are
13 allocated accordingly.

14
15 Thus, costs assigned to the power production functions include specific cost items whose sole
16 purpose is power production and the “power production share” of joint costs assigned to more
17 than one purpose. Both types of costs are included in BPA’s generation revenue requirement.

18 19 **1.2.1.4 Section 4(h)(10)(C) Credit**

20 The Northwest Power Act provides:

21 The Administrator shall use the Bonneville Power Administration fund and the
22 authorities available to the Administrator under this Act and other laws
23 administered by the Administrator to protect, mitigate, and enhance fish and

1 wildlife to the extent affected by the development and operation of any
2 hydroelectric project of the Columbia River and its tributaries

3 16 U.S.C. § 839b(h)(10)(A).
4

5 BPA is not obligated to reimburse the U.S. Treasury for the non-power portion of these fish
6 and wildlife costs. Such non-power costs are instead allocated to the various project purposes
7 by the BPA Administrator, in consultation with the Corps and Reclamation, pursuant to
8 section 4(h)(10)(C) of the Northwest Power Act. 16 U.S.C. § 839b(h)(10)(C). This allocation
9 to various project purposes implements the principle that electric power consumers bear no
10 greater share of the costs of fish and wildlife mitigation than the power portion of the project.
11

12 The legislative history of section 4(h)(10)(C) illustrates how the expenditures by the
13 Administrator for protection, mitigation, and enhancement of fish and wildlife at individual
14 Federal projects in excess of the portion allocable to electric consumers are to be treated as a
15 credit for electric consumers. H.R. Rep. No. 976, 96th Cong., 2d Sess., pt. 2 at 45 (1980),
16 *reprinted in* 1980 U.S.C.C.A.N. 5989, 6011. This principle is satisfied by treating expenditures
17 on behalf of non-power purposes as other project costs. BPA receives a credit against its cash
18 transfers to the U.S. Treasury for expenditures attributable to non-power purposes. BPA's initial
19 funding of all the costs for fish and wildlife has the advantage of avoiding the need for funding
20 the non-power portion of these costs through the annual appropriations process.
21
22
23

1 **1.2.1.5 Colville Settlement Act Credits**

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

7
8 The Settlement Agreement obligates BPA to make annual payments to the Colville Tribes.
9 Payments have been tied to BPA’s average prices and the amount of annual generation from
10 Grand Coulee Dam. Under the Refinancing Act, part of the Omnibus Consolidated Rescissions
11 and Appropriations Act of 1996, P.L. No. 104-134, 110 Stat. 1321, BPA receives annual credits
12 from the U.S. Treasury against payments due the U.S. Treasury in order to defray a portion of
13 the costs of making payments to the Colville Tribes. The annual payments to the Colville Tribes
14 are forecast to be \$22.6 million in FY 2018 and \$22.9 million in FY 2019. The credits for the
15 FY 2018–2019 rate period are \$4.6 million in each fiscal year.

16
17 **1.2.2 Repayment Requirements and Policies**

18 **1.2.2.1 Separate Repayment Studies**

19 Section 10 of the Transmission System Act, 16 U.S.C. § 838h, and section 7(a)(2)(C) of the
20 Northwest Power Act, 16 U.S.C. § 839e(a)(2)(C), provide that the recovery of the costs of the
21 Federal transmission system shall be equitably allocated between Federal and non-Federal power
22 utilizing such system. In 1982, the Commission first directed BPA to provide accounting and
23 repayment statements for its transmission system separate and apart from the accounting and

1 repayment statements for the Federal generation system. *Bonneville Power Admin.*, 20 FERC
2 ¶ 61,142 (1982). The Commission required BPA to establish books of account for the Federal
3 Columbia River Transmission System (FCRTS) separate from its generation books of account;
4 explained that the FCRTS shall be comprised of all investments, including administrative and
5 management costs, related to the transmission of electric power; and directed BPA to develop
6 repayment studies for its transmission function separate from those for its generation function.
7 Such studies must set forth the date of each investment, the repayment date, and the amount
8 repaid from transmission revenues. *Bonneville Power Admin.*, 26 FERC ¶ 61,096 (1984).

9
10 The Commission approved BPA’s methodology for separate repayment studies in 1984.
11 *Bonneville Power Admin.*, 28 FERC ¶ 61,325 (1984). Thus, BPA has prepared separate
12 repayment studies for its transmission and generation functions since 1984. This standard has
13 enabled BPA to set power and transmission rates separately with minimal change in repayment
14 policy and the process for developing each revenue requirement. This Study incorporates only
15 the repayment study for the generation function for FY 2018–2019.

16 17 **1.2.2.2 Repayment Schedules**

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

1 There have been a number of changes in BPA's repayment policy over the years concurrent with
2 expansion of the Federal system and changing conditions. In general, current repayment criteria
3 were approved by the Secretary of the Interior on April 3, 1963. These criteria were refined and
4 submitted to the Secretary and the Federal Power Commission in support of BPA's rate filing in
5 September 1965.

6
7 The repayment policy was presented to Congress for its consideration for the authorization of the
8 Grand Coulee Dam Third Powerhouse in June 1966. The underlying theory of repayment was
9 discussed in the House of Representatives' Report related to authorization of this project,
10 H.R. Rep. No. 89-1409, 2d Sess., at 9-10 (1966). As stated in that report:

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

17
18 This approach to repayment scheduling has the effect of averaging the
19 year-to-year variations in costs and revenues over the repayment period. This
20 results in a uniform cost per unit of power sold, and permits the maintenance of
21 stable rates for extended periods. It also facilitates the orderly marketing of
22 power and permits Bonneville Power Administration customers, which include

1 both electric utilities and electroprocess industries, to plan for the future with
2 assurance.

3
4 The Secretary of the Interior issued a statement of power policy on September 30, 1970, setting
5 forth general principles that reaffirmed the repayment policy as previously developed. The most
6 pertinent of these principles were set forth in the Department of the Interior Manual, Part 730,
7 Chapter 1:

8 A. Hydroelectric power, although not a primary objective, will be proposed to
9 Congress and supported for inclusion in multiple-purpose Federal projects
10 when . . . it is capable of repaying its share of the Federal investment,
11 including operation and maintenance costs and interest, in accordance with
12 the law.

13 B. Electric power generated at Federal projects will be marketed at the lowest
14 rates consistent with sound financial management. Rates for the sale of
15 Federal electric power will be reviewed periodically to assure their
16 sufficiency to repay operating and maintenance costs and the capital
17 investment within 50 years with interest that more accurately reflects the
18 cost of money.

19
20 To achieve a greater degree of uniformity in repayment policy for all Federal power marketing
21 administrations, the Deputy Assistant Secretary of the Department of the Interior (DOI) issued a
22 memo on August 2, 1972, outlining (1) a uniform definition of the start of the repayment period
23 for a particular project; (2) the method for including future replacement costs in repayment

1 studies; and (3) a provision that the investment or obligation bearing the highest interest rate
2 shall be amortized first, to the extent possible, while ensuring that BPA still complies with the
3 prescribed repayment period established for each increment of investment.

4
5 A further clarification of the repayment policy was outlined in a joint memo of January 7, 1974,
6 from the Assistant Secretary for Reclamation and Assistant Secretary for Energy and Minerals.
7 This memo states that in addition to meeting the overall objective of repaying the Federal
8 investment and obligations within the prescribed repayment periods, revenues shall be adequate,
9 except in unusual circumstances, to repay annually all costs for O&M, purchased power, and
10 interest.

11
12 On March 22, 1976, the DOI issued Chapter 4 of Part 730 of the DOI Manual to codify financial
13 reporting requirements for the Federal power marketing agencies. It describes standard policies
14 and procedures for preparing system repayment studies.

15
16 BPA and other Federal power marketing agencies were transferred to the newly established
17 Department of Energy on October 1, 1977. DOE Organization Act, 42 U.S.C. § 7101 *et seq.*
18 (1994). The DOE adopted the policies set forth in Part 730 of the DOI Manual by issuing
19 Interim Management Directive No. 1701 on September 28, 1977, which subsequently was
20 replaced by RA 6120.2, issued on September 20, 1979, and amended on October 1, 1983.

21
22 The repayment policy outlined in DOE Order RA 6120.2, paragraph 12, provides that BPA's
23 total revenues from all sources must be sufficient to:

- 1 (1) Pay all annual costs of operating and maintaining the Federal power system;
- 2 (2) Pay the cost of obtaining power through purchase and exchange agreements,
3 the cost for transmission services, and other costs during the year in which
4 such costs are incurred;
- 5 (3) Pay interest each year on the unamortized portion of the commercial power
6 investment financed with appropriated funds at the interest rates established
7 for each generating project and for each annual increment of such investment
8 in the BPA transmission system, except that recovery of annual interest
9 expense may be deferred in unusual circumstances for short periods of time;
- 10 (4) Pay when due the interest and amortization portion on outstanding bonds
11 sold to the U.S. Treasury;
- 12 (5) Repay:
 - 13 • each dollar of power investments and obligations in the FCRPS
14 generating projects within 50 years after the projects become
15 revenue-producing (50 years has been deemed a “reasonable period” as
16 intended by Congress, except for the Yakima-Chandler Project, which
17 has a legislated amortization period of 66 years);
 - 18 • each annual increment of transmission financed by Federal investments
19 and obligations within the average service life of such transmission
20 facilities (currently 40 years) or within a maximum of 50 years,
21 whichever is less (BPA has interpreted RA 6120.2 to require repayment
22 of bonds sold to finance conservation to be within the average service

1 lives of these projects, currently estimated to be five years, and for fish
2 and wildlife facilities to be 15 years);

- 3 • the federally financed amount of each replacement within its service life
4 up to a maximum of 50 years; and

5 (6) As required by Pub.L. No. 89-448, repay the portion of construction costs at
6 Federal reclamation projects that is beyond the repayment ability of the
7 irrigators, and which is assigned for repayment from commercial power
8 revenues, within the same overall period available to the irrigation water
9 users for making their payments on construction costs.

10
11 The typical repayment period for appropriated capital investments for generation is 50 years
12 from the year in which the plant is placed in service. Appropriated transmission investments
13 have due dates set at no more than 45 years. The Refinancing Act (see section 1.2.1.2) overrides
14 provisions in DOE Order RA 6120.2 related to determining interest during construction and
15 assigning interest rates to Federal investments financed by appropriations. The Refinancing Act
16 also contains provisions on repayment periods (due dates) for the refinanced investments.

17
18 Other sections within DOE Order RA 6120.2 require that any outstanding deferred interest
19 payments must be repaid before any planned amortization payments are made. Also, repayments
20 are to be made by amortizing those Federal investments and obligations bearing the highest
21 interest rate first, to the extent possible, while ensuring that BPA still completes repayment of
22 each increment of Federal investment and obligation within its prescribed repayment period.

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

- 7 (1) the irrigation costs are to be paid from "net revenues" of the power
8 system, with net revenues defined as those revenues over and above the
9 amount needed to cover power costs and previously authorized irrigation
10 payments;
- 11 (2) the construction of new Federal irrigation projects will be scheduled
12 or deferred, if necessary, so that the repayment of the irrigation costs from
13 power revenues will not require an increase in the BPA power rate level;
14 and
- 15 (3) the total amount of irrigation costs to be repaid from power revenues
16 shall not average more than \$30 million per year in any period of
17 20 consecutive years.

1 **2. DEVELOPMENT OF THE GENERATION REVENUE REQUIREMENT**

2
3 **2.1 Spending Level Development**

4 The development of program spending levels occurs outside the rate process. For the FY 2018–
5 2019 rate period, it began in June 2016, when BPA hosted the 2016 Integrated Program Review
6 (IPR) and Capital Investment Review (CIR) workshops. These workshops provided customers
7 and constituents an opportunity to examine, understand, and comment on BPA’s cost projections
8 and capital investments for BPA’s power and transmission functions.

9
10 BPA began the 2016 IPR discussion with the release of the IPR initial report and an opening
11 workshop on June 16 containing an overview of Power Services, Transmission Services, and
12 Corporate proposed spending levels for FY 2017–2019 (the cost evaluation period). The initial
13 report and workshop discussed proposed expense spending levels, particularly for the FY 2018–
14 2019 rate period; the drivers, goals, and risks associated with the proposed expense spending
15 levels; and comparisons to previous IPR costs. The initial report also included capital cost
16 projections for FY 2018–2019.

17
18 BPA held five days of workshops in June 2016 to discuss the projected capital spending and
19 program spending levels of many program areas, including the Columbia Generating Station
20 (CGS); Corps; Reclamation; BPA’s energy efficiency, transmission, and fish and wildlife
21 programs; and BPA’s Information Technology program. While debt management actions are
22 outside the scope of the IPR, workshops were held to enhance participants’ understanding of the
23 implications of past debt management decisions, proposed capital spending, and potential debt

1 management tools. After considering the comments received, BPA released a final IPR
2 close-out report in October 2016.

3
4 This Study incorporates the spending levels identified in the 2016 IPR final close-out report,
5 which can be found on BPA’s public Web site: Finance & Rates—Financial Public Processes—
6 Integrated Program Review.

8 **2.2 Capital Funding**

9 The forecast of BPA’s capital investments for FY 2018–2019 used in setting the BP-18 power
10 rates was produced in the IPR/CIR process. The following section describes the forecasts
11 developed in the CIR, recognizing that the timing of some planned capital spending may be
12 stretched into the following rate period. FCRPS capital investments include Corps, Reclamation,
13 and BPA capital investments and third-party resource investments for which debt is secured by
14 BPA (capitalized contracts). Projections of current FCRPS capital outlays total \$757 million for
15 the FY 2018–2019 rate period. These investments include:

- 16 • improvements and maintenance needed to increase reliability, safety, and
17 performance at the CGS nuclear plant;
- 18 • improvements and maintenance needed to improve reliability of the
19 Federal hydro system;
- 20 • investment in fish and wildlife mitigation measures;
- 21 • investment in conservation activities; and
- 22 • investment in capital equipment.

1 This Study projects that no capital investments will be funded from current revenues.

3 **2.2.1 Bonds Issued to the U.S. Treasury**

4 Bonds issued to the U.S. Treasury are the source of capital that will be used to finance BPA's
5 FY 2018–2019 capital program and Corps and Reclamation investments that BPA has agreed to
6 direct-fund under section 2406 of Pub.L. No. 102-486, 16 U.S.C. § 839d-1. These expenditures
7 include a total capital projection of \$622.9 million, which is comprised of BPA Fish and Wildlife
8 direct program investments (\$95 million), BPA capital equipment (\$21.9 million), and
9 generating resource investments of the Corps and Reclamation (\$506 million) during FY 2018–
10 2019. *See* Table 3.

11
12 Interest rates on bonds issued by BPA to the U.S. Treasury are set at market interest rates
13 comparable to interest rates on securities issued by other agencies of the U.S. Government.
14 Interest rates on bonds projected to be issued are included in Chapter 6 of the Power Revenue
15 Requirement Study Documentation, BP-18-E-BPA-02A.

17 **2.2.2 Federal Appropriations**

18 In general, the Study reflects that all Corps and Reclamation capital investments in the FCRPS
19 will be financed by Federal appropriations unless they are direct-funded by BPA. This Study
20 includes projected appropriated investments totaling \$134 million during the rate period for
21 Corps fish and wildlife mitigation and recovery measures through the Columbia River Fish
22 Mitigation (CRFM) project. No other appropriations-financed investments are forecast for the

1 rate period. Capital investments funded by this source do not become BPA’s obligation to repay
2 until they are placed in service.

3
4 The interest rate forecast for appropriated capital investments expected to be placed in service is
5 found in Chapter 6 of the Power Revenue Requirement Study Documentation, BP-18-E-
6 BPA-02A. Each new capital investment is assigned a rate from the U.S. Treasury yield curve
7 prevailing in the month prior to the beginning of the fiscal year in which the new investment is
8 placed in service.

9
10 To determine interest during construction for new capital investments for a given fiscal year, the
11 prevailing U.S. Treasury one-year rate for each fiscal year of construction is applied to the sum
12 of the cumulative expenditures made and interest during construction that has accrued prior to
13 the end of the fiscal year. *See* Power Revenue Requirement Study Documentation, BP-18-E-
14 BPA-02A, Ch. 6.

16 **2.2.3 Third-Party Debt**

17 Third-party debt differs from U.S. Treasury debt in that entities other than BPA or the
18 U.S. Treasury issue the debt. BPA’s promise to make payments serves as security for bonds or
19 other debt that the third party issues, resulting in wider market access and potentially more
20 favorable interest rates for the seller. Examples of acquisitions financed in this way include the
21 Energy Northwest, Inc. (EN) WNP-1, WNP-3, and CGS nuclear power projects and the Lewis
22 County Public Utility District Hydroelectric Project (Cowlitz Falls).

1 This Study includes an expense adjustment called the Regional Cooperation Debt (RCD) Effect
2 that represents the estimated net revenue requirement effect if BPA and EN were to refinance
3 WNP-1 and WNP-3 debt that is due in 2018 and instead repay higher interest rate Federal
4 appropriations. This transaction is uncertain and thus is not included as a modeling assumption
5 in the rate case. Instead, BPA has estimated the effect that this transaction would have on
6 capital-related costs and included that effect as an undistributed reduction. *See* Power Revenue
7 Requirement Study Documentation, BP-18-E-BPA-02A, Tables 3H and 3I.

8 9 **2.2.4 Prepayment Program**

10 The prepayment program involves customers prepaying future power bills by purchasing blocks
11 of revenue credits that would be applied to billings through FY 2028, when the current Regional
12 Dialogue contracts expire. Four customers chose to participate in the program, prepaying
13 revenues of \$340 million.

14 15 **2.3 Debt Optimization Program**

16 After base power rates were filed for the FY 2002–2006 rate period, BPA instituted a Debt
17 Optimization Program (DOP) with EN as a means of replenishing Treasury borrowing authority.
18 Debt Optimization (DO) involves extending EN debt that has come due and using the cash flows
19 that would have gone to pay the EN debt to repay an equivalent amount of Federal debt.

20
21 BPA ended the DO program in 2009, and thus no forecasts of DO actions are included in the
22 proposed rates. This Study includes the debt service on EN debt optimization transactions
23 completed through FY 2009.

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.

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

6
7 Bonds are issued primarily to finance BPA's Fish and Wildlife Program, and Corps and
8 Reclamation investments that are direct-funded by BPA. These bonds are repaid within the
9 terms and conditions of each bond issued to the U.S. Treasury. Bonds to finance fish and
10 wildlife capital investments are issued with maturities not to exceed 15 years, the same period
11 over which BPA amortizes these capital investments. Corps and Reclamation direct-funding
12 bonds are issued with maturities not to exceed 30 years, although they can be refinanced within
13 the 50-year repayment period.

14
15 Based on these parameters, the repayment study establishes a schedule of planned amortization
16 payments and resulting interest expense by determining the lowest levelized debt service stream
17 necessary to repay all generation obligations within the required repayment period.

18
19 For further discussion of the repayment program, see Power Revenue Requirement Study
20 Documentation, BP-18-E-BPA-02A, Ch. 13.

1 **2.5 Products Used by Other Studies**

2 This Study produces information that is used in other studies. The information provided to the
3 Rate Analysis Model (RAM2018) includes itemized program spending data; the allocation of net
4 interest, MRNR, and PNRR to cost pools; and the allocation of interest income between the
5 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 first table, the Income Statement, includes projections of Total Expenses, PNRR, and if necessary, an MRNR component. The second table, the Statement of Cash Flow, shows the analysis used to determine MRNR and the cash available for risk mitigation.

The Income Statement, Table 3, displays the components of the annual revenue requirement, which include 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 in the IPR, outside the rate case. 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) is added to the income statement as a result of analysis of the Statement of Cash Flow, Table 4. This analysis includes two new lines, Non-Cash Expenses and Repayment of Non-Federal Obligations, reflecting the treatment of the issuance and repayment of lines of credit by Energy Northwest. 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

1 payments. If cash flows are not adequate, MRNR is added. It serves as a net revenue target to
2 ensure adequate cash flow.

3
4 The Statement of Cash Flow (Table 4) analyzes annual cash inflow and outflow. Cash provided
5 by Operating Activities (line 9), driven by the Non-Cash Items shown in lines 4, 5, 6, and 7,
6 must be sufficient to compensate for the difference between Cash Used for Investment Activities
7 (line 16) and Cash Provided by Borrowing and Appropriations (line 25). If cash provided by
8 current operations is not sufficient, MRNR must be included in revenue requirements to
9 accommodate the shortfall, yielding at least zero Annual Increase in Cash (line 26). Any MRNR
10 amounts shown on the Statement of Cash Flow (line 2) are then incorporated in the Income
11 Statement (Table 3, line 34).

12 13 **3.2 Current Revenue Test**

14 Consistent with DOE Order RA 6120.2, the continuing adequacy of existing rates must be tested
15 annually. The current revenue test, exhibited in Tables 5 and 6, determines whether the revenue
16 expected from current rates will meet cost recovery requirements during the FY 2018–2019 rate
17 period and the ensuing repayment period. Revenue at current rates can be found in the Power
18 Rates Study (PRS) Documentation, BP-18-E-BPA-01A, Table 9.1.

19
20 The result of the current revenue test demonstrates that projected revenue from current rates is
21 inadequate to meet the cost recovery criteria of Order RA 6120.2 over the repayment period,
22 because the net position is negative. *See* Table 7, column K. If revenues from current rates were

1 adequate, current rates could be extended, although other reasons may exist for revising rates,
2 such as the implementation of a new rate design.

3 4 **3.3 Revised Revenue Test**

5 Consistent with DOE Order RA 6120.2, the adequacy of proposed rates must be demonstrated.

6 The revised revenue test determines whether the revenue projected from proposed rates will meet
7 cost recovery requirements for the rate period. The revised revenue test is conducted using the
8 forecast of revenue under proposed rates. PRS Documentation, BP-18-E-BPA-01A, Table 9.2.

9
10 For the rate period, the demonstration of the adequacy of proposed rates is shown in Tables 8
11 and 9. Table 9 tests the sufficiency of the resulting net revenues from Table 8 (line 35) for
12 making the planned annual amortization and irrigation assistance payments. The sufficiency of
13 net revenues is demonstrated by the annual increase (decrease) in cash (Table 9, line 27). The
14 annual cash flow must be at least zero to demonstrate the adequacy of the projected revenues to
15 cover all cash requirements.

16
17 The results of the revised revenue test demonstrate that proposed rates are adequate to fulfill the
18 basic cost recovery requirements for the rate period, FY 2018–2019. With the successful test of
19 proposed rates, the rate development process ends.

20 21 **3.4 Repayment Test at Proposed Rates**

22 Table 10, Generation Revenue from Proposed Rates, demonstrates whether projected revenue
23 from proposed rates is adequate to meet the cost recovery criteria of DOE Order RA 6120.2 over

1 the repayment period. The data are presented in a format consistent with the revised revenue
2 tests, Tables 8 and 9, and the separate accounting analysis that is an attachment to the filing with
3 the Commission. The focal point of these tables is the net position (column K), which is the
4 amount remaining after meeting annual expenses requiring cash for the rate period and
5 repayment of the Federal investment. Thus, if the net position is zero or greater in each of the
6 years of the rate period through the repayment period, the projected revenues demonstrate BPA's
7 ability to repay the Federal investment in the FCRPS within the allowable time. As shown in
8 column K, the resulting net position is zero or greater for each year of the rate period and in each
9 year of the repayment period.

10
11 The historical data on this table were been taken from BPA's separate accounting analysis. The
12 rate period data were developed specifically for this Study. The repayment period data are
13 presented consistent with the requirements of RA 6120.2. Typically, the test of revenue
14 sufficiency through the repayment period uses expenses from the last year of the rate period. As
15 has been done since the WP-07 rate proceeding, expenses for the CGS nuclear plant are
16 normalized because it is on a two-year refueling cycle. FY 2019 is a refueling year for CGS,
17 which increases O&M costs for the facility and increases BPA's power purchase costs to make
18 up for the loss of generation during the refueling. The projection of these outage costs in every
19 year of the repayment period would misrepresent the costs associated with the CGS refueling
20 cycle. For the purposes of this revenue test, these CGS costs for FY 2018 and FY 2019 have
21 been averaged to produce an average annual cost for the operation of CGS for the rate period.
22 Augmentation purchases are also averaged in this fashion because of the higher costs in FY 2019
23 to make up for lost CGS generation.

1 Table 11, Amortization of Generation Investments Over Repayment Period, summarizes the
2 amortization of Federal investments over the repayment period. It displays the total investment
3 costs through the cost evaluation period, forecast replacements required to maintain the system
4 through the repayment period, the cumulative dollar amount of investment placed in service,
5 scheduled amortization payments for each year of the repayment period (due and discretionary),
6 unamortized investments including replacements through the repayment period, unamortized
7 obligations as determined by a term schedule (if all obligations were paid at maturity and never
8 early), predetermined amortization payments, and the unamortized amount of irrigation
9 assistance for each year of the repayment period.

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TABLES

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

		A	B	C
		FY 2018	FY 2019	Average
1	Projected Revenues from Proposed Rates	\$ 2,892,061	\$ 2,913,059	\$ 2,902,560
2	Projected Expenses	<u>2,940,909</u>	<u>2,796,100</u>	<u>2,868,504</u>
3	Net Revenues	\$ (48,848)	\$ 116,959	\$ 34,056

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

Before Amortization Shift					
		A	B	C	D
		Bond	Appropriations	Irrigation	
	Fiscal Year	Amortization	Amortization	Assistance	Total
1	2018	\$9,000	\$126,747	\$27,234	\$162,981
2	2019	<u>156,250</u>	<u>17,940</u>	<u>56,573</u>	<u>230,763</u>
3	Total	\$165,250	\$144,687	\$83,807	\$393,744
After Amortization Shift					
		A	B	C	D
		Bond	Appropriations	Irrigation	
	Fiscal Year	Amortization	Amortization	Assistance	Total
4	2018	\$9,000	\$77,247	\$27,234	\$113,481
5	2019	<u>156,250</u>	<u>67,440</u>	<u>56,573</u>	<u>280,263</u>
6	Total	\$165,250	\$144,687	\$83,807	\$393,744

Table 3: Generation Revenue Requirement Income Statement
(\$000s)

		A	B
		2018	2019
1	OPERATING EXPENSES		
2	POWER SYSTEM GENERATION RESOURCES		
3	OPERATING GENERATION RESOURCES	702,900	771,694
4	OPERATING GENERATION SETTLEMENT PAYMENTS	22,612	22,997
5	NON-OPERATING GENERATION	1,500	1,534
6	CONTRACTED POWER PURCHASES	98,949	98,549
7	AUGMENTATION POWER PURCHASES	0	12,700
8	EXCHANGES & SETTLEMENTS	318,329	318,343
9	RENEWABLE GENERATION	38,332	39,060
10	GENERATION CONSERVATION	126,267	126,187
11	POWER NON-GENERATION OPERATIONS	95,007	96,459
12	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	210,077	207,093
13	F&W/USF&W/PLANNING COUNCIL	322,107	322,397
14	GENERAL AND ADMINISTRATIVE/SHARED SERVICES	86,352	89,291
15	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(84,534)	(85,123)
16	NON-FEDERAL DEBT SERVICE	646,360	410,394
17	DEPRECIATION	142,911	142,860
18	AMORTIZATION	88,504	89,166
19	TOTAL OPERATING EXPENSES	2,815,673	2,663,603
20			
21	INTEREST EXPENSE:		
22	INTEREST		
23	APPROPRIATED FUNDS	105,610	99,742
24	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
25	BONDS ISSUED TO U.S. TREASURY	63,663	75,058
26	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
27	NON-FEDERAL INTEREST	11,628	10,747
28	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(6,355)	(6,239)
29	INTEREST CREDIT ON CASH RESERVES	(2,991)	(3,163)
30	NET INTEREST EXPENSE	125,618	130,209
31			
32	TOTAL EXPENSES	2,941,291	2,793,812
33			
34	MINIMUM REQUIRED NET REVENUE 1/	0	68,050
35	PLANNED NET REVENUE FOR RISK	0	0
36	PLANNED NET REVENUE, TOTAL (30+31)	0	68,050
37			
38	TOTAL REVENUE REQUIREMENT	2,941,291	2,861,861
	1/ See note on Statement of Cash Flows		

**Table 4: Generation Revenue Requirement Statement of Cash Flow
(\$000s)**

		A	B
		2018	2019
1	CASH FROM OPERATING ACTIVITIES		
2	MINIMUM REQUIRED NET REVENUE 1/	0	68,050
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	11,628	10,747
5	DEPRECIATION AND AMORTIZATION	231,415	232,027
6	NON-CASH EXPENSES	0	0
7	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
8	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
9	NON-CASH REVENUES	(34,124)	(34,124)
10	CASH PROVIDED BY OPERATING ACTIVITIES	162,981	230,763
11			
12	CASH FROM INVESTMENT ACTIVITIES		
13	INVESTMENT IN:		
14	UTILITY PLANT (INCLUDING AFUDC)	(334,219)	(328,154)
15	ENERGY EFFICIENCY	0	0
16	FISH & WILDLIFE	(51,000)	(44,000)
17	CASH USED FOR INVESTMENT ACTIVITIES	(385,219)	(372,154)
18			
19	CASH FROM BORROWING AND APPROPRIATIONS:		
20	INCREASE IN BONDS ISSUED TO U.S. TREASURY	303,950	318,950
21	REPAYMENT OF BONDS ISSUED TO U.S. TREASURY	(9,000)	(156,250)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	81,269	53,204
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(126,747)	(17,940)
24	REPAYMENT OF NON-FEDERAL OBLIGATIONS	0	0
25	CUSTOMER PROCEEDS	0	0
26	PAYMENT OF IRRIGATION ASSISTANCE	(27,234)	(56,573)
27	CASH PROVIDED BY BORROWING AND APPROPRIATIONS	222,238	141,391
28			
29	ANNUAL INCREASE (DECREASE) IN CASH	0	0
30			
31	PLANNED NET REVENUE FOR RISK	0	0
32			
33	TOTAL ANNUAL INCREASE (DECREASE) IN CASH	0	0
	1/ Minimum required net revenues are added to ensure sufficient cash flow is available to repay the federal investment.		

Table 5: Generation Current Revenue Test Income Statement
(\$000s)

		A	B
		2018	2019
1	REVENUES FROM CURRENT RATES	2,801,118	2,814,273
2	OPERATING EXPENSES		
3	POWER SYSTEM GENERATION RESOURCES		
4	OPERATING GENERATION	702,900	771,694
5	OPERATING GENERATION SETTLEMENTS	22,612	22,997
6	NON-OPERATING GENERATION	1,500	1,534
7	CONTRACTED POWER PURCHASES	98,949	98,549
8	AUGMENTATION POWER PURCHASES	0	12,700
9	EXCHANGES & SETTLEMENTS	318,329	318,343
10	RENEWABLE GENERATION	38,332	39,060
11	GENERATION CONSERVATION	126,267	126,187
13	POWER NON-GENERATION OPERATIONS	95,007	96,459
14	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	210,077	207,093
15	F&W/USF&W/PLANNING COUNCIL	322,107	322,397
16	BPA INTERNAL SUPPORT	86,352	89,291
17	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(84,534)	(85,123)
18	NON-FEDERAL DEBT SERVICE	646,360	410,394
19	DEPRECIATION	142,911	142,860
20	AMORTIZATION	88,504	89,166
21	TOTAL OPERATING EXPENSES	2,815,673	2,663,603
22	INTEREST EXPENSE		
23	INTEREST		
24	APPROPRIATED FUNDS	105,610	99,742
25	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
26	BONDS ISSUED TO U.S. TREASURY	63,663	75,058
27	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
	NON-FEDERAL INTEREST	11,628	10,747
28	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(6,355)	(6,239)
29	INTEREST CREDIT ON CASH RESERVES	(2,753)	(2,493)
30	NET INTEREST EXPENSE	125,856	130,878
31	TOTAL EXPENSES	2,941,529	2,794,481
32	NET REVENUES	(140,411)	19,791

**Table 6: Generation Current Revenue Test Statement of Cash Flow
(\$000s)**

		A	B
		2018	2019
1	CASH PROVIDED BY OPERATING ACTIVITIES		
	NET REVENUES for Interest Income Calculation	(131,536)	28,046
2	NET REVENUES	(140,411)	19,791
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	11,628	10,747
5	DEPRECIATION AND AMORTIZATION	231,415	232,027
	NON-CASH EXPENSES	0	0
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	22,570	182,504
10			
11	CASH USED FOR INVESTMENT ACTIVITIES		
12	INVESTMENT IN:		
13	FEDERAL UTILITY PLANT (INCLUDING AFUDC)	(334,219)	(328,154)
14	CONSERVATION	0	0
15	FISH & WILDLIFE	(51,000)	(44,000)
16	CASH USED FOR INVESTMENT ACTIVITIES	(385,219)	(372,154)
17			
18	CASH FROM (AND USED FOR) FINANCING ACTIVITIES		
19	INCREASE IN TREASURY DEBT	303,950	318,950
21	REPAYMENT OF TREASURY DEBT	(9,000)	(156,250)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	81,269	53,204
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(126,747)	(17,940)
	REPAYMENT OF NON-FEDERAL OBLIGATIONS	0	0
	CUSTOMER PROCEEDS	0	0
24	PAYMENT OF IRRIGATION ASSISTANCE	(27,234)	(56,573)
25	CASH USED FOR FINANCING ACTIVITIES	222,238	141,391
26			
27	ANNUAL INCREASE (DECREASE) IN CASH	(140,411)	(48,258)

**Table 7: 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	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)
	(STATEMENT A)	(STATEMENT E)	(STATEMENT E)								
1	2014	85,655,930	18,971,574	52,260,235	5,723,414	7,536,544	1,164,163	5,120,338	6,283,752	5,521,807	157,944
2											604,001
3	GENERATION										
4	2015	2,588,858	1,009,924	841,782	224,188	185,925	327,038	192,292	518,581	402,532	61,066
5	2016	2,847,676	1,140,374	864,192	222,551	185,925	434,633	267,145	651,830	1,053,348	51,482
6	COST EVALUATION PERIOD										(453,000)
7	2017	2,775,436	1,119,664	1,376,180	228,502	195,072	(143,982)	195,034	16,928	109,429	51,482
8	RATE APPROVAL PERIOD										(143,982)
9	2018	2,801,118	1,198,025	1,386,234	231,415	125,856	(140,411)	197,105	22,570	86,247	27,234
10	2019	2,814,273	1,197,361	1,234,215	232,027	130,878	19,791	196,837	182,504	223,690	56,253
11	REPAYMENT PERIOD										(90,911)
12	2020	2,814,273	1,197,361	1,183,039	232,027	146,005	55,841	196,837	218,554	197,923	24,317
13	2021	2,814,273	1,197,361	1,162,870	232,027	148,799	73,216	196,837	235,929	223,989	14,747
14	2022	2,814,273	1,197,361	1,168,855	232,027	150,746	65,283	196,837	227,996	213,821	16,060
15	2023	2,814,273	1,197,361	1,166,472	232,027	148,395	70,017	196,837	232,730	220,806	12,846
16	2024	2,814,273	1,197,361	1,172,871	232,027	149,122	62,891	196,837	225,605	210,401	15,117
17	2025	2,814,273	1,197,361	1,184,207	232,027	154,303	46,375	196,837	209,088	194,403	13,543
18	2026	2,814,273	1,197,361	1,180,498	232,027	151,751	52,635	196,837	215,348	212,347	20,755
19	2027	2,814,273	1,197,361	1,176,424	232,027	156,144	52,317	196,837	215,030	205,509	6,118
20	2028	2,814,273	1,197,361	1,190,190	232,027	157,935	36,760	196,837	199,473	183,675	11,186
21	2029	2,814,273	1,197,361	913,927	232,027	148,193	232,764	196,837	485,477	475,536	4,065
22	2030	2,814,273	1,197,361	1,003,168	232,027	142,090	329,227	196,837	402,340	393,144	1,996
23	2031	2,814,273	1,197,361	947,912	232,027	134,752	302,221	196,837	464,934	448,407	10,524
24	2032	2,814,273	1,197,361	835,030	232,027	123,458	282,397	196,837	589,110	581,863	-
25	2033	2,814,273	1,197,361	803,598	232,027	115,212	466,074	196,837	628,787	616,500	4,347
26	2034	2,814,273	1,197,361	808,531	232,027	94,965	481,389	196,837	644,102	636,161	7,941
27	2035	2,814,273	1,197,361	808,550	232,027	79,621	496,714	196,837	659,427	643,725	7,761
28	2036	2,814,273	1,197,361	808,514	232,027	59,749	516,522	196,837	679,235	642,374	28,920
29	2037	2,814,273	1,197,361	807,971	232,027	39,101	537,812	196,837	700,525	676,807	15,778
30	2038	2,814,273	1,197,361	797,949	232,027	16,474	570,462	196,837	733,175	725,234	7,941
31	2039	2,814,273	1,197,361	765,716	232,027	(8,387)	627,556	196,837	790,269	768,147	14,181
32	2040	2,814,273	1,197,361	763,407	232,027	(33,187)	654,664	196,837	817,377	727,976	-
33	2041	2,814,273	1,197,361	756,474	232,027	(45,166)	673,577	196,837	836,290	816,435	617,855
34	2042	2,814,273	1,197,361	756,473	232,027	(45,166)	673,578	196,837	836,291	816,435	73,659
35	2043	2,814,273	1,197,361	756,471	232,027	(45,166)	673,580	196,837	836,293	816,435	-
36	2044	2,814,273	1,197,361	872,137	232,027	(44,663)	557,410	196,837	720,123	720,123	-
37	2045	2,814,273	1,197,361	1,216,286	232,027	(43,166)	211,764	196,837	374,477	374,477	11,579
38	2046	2,814,273	1,197,361	1,216,285	232,027	(43,166)	211,765	196,837	374,478	374,478	-
39	2047	2,814,273	1,197,361	1,216,288	232,027	(43,166)	211,763	196,837	374,476	374,476	-
40	2048	2,814,273	1,197,361	1,216,285	232,027	(43,166)	211,765	196,837	374,478	374,478	-
41	2049	2,814,273	1,197,361	1,216,286	232,027	(43,166)	211,765	196,837	374,478	374,478	-
42	2050	2,814,273	1,197,361	1,216,286	232,027	(43,166)	211,765	196,837	374,478	374,478	-
43	2051	2,814,273	1,197,361	1,216,285	232,027	(43,166)	211,766	196,837	374,479	374,479	-
44	2052	2,814,273	1,197,361	1,216,285	232,027	(43,166)	211,765	196,837	374,478	374,478	-
45	2053	2,814,273	1,197,361	1,216,285	232,027	(43,166)	211,765	196,837	374,478	374,478	-
46	2054	2,814,273	1,197,361	1,216,286	232,027	(43,166)	211,764	196,837	374,477	374,477	-
47	2055	2,814,273	1,197,361	1,216,287	232,027	(43,166)	211,764	196,837	374,477	374,477	-
48	2056	2,814,273	1,197,361	1,216,284	232,027	(43,166)	211,767	196,837	374,480	374,480	-
49	2057	2,814,273	1,197,361	1,216,284	232,027	(43,166)	211,767	196,837	374,480	374,480	-
50	2058	2,814,273	1,197,361	1,216,285	232,027	(43,166)	211,766	196,837	374,479	374,479	-
51	2059	2,814,273	1,197,361	1,216,288	232,027	(46,053)	214,649	196,837	377,362	377,362	-
52	2060	2,814,273	1,197,361	1,216,288	232,027	(46,185)	214,782	196,837	377,495	377,495	-
53	2061	2,814,273	1,197,361	1,216,287	232,027	(46,185)	214,782	196,837	377,495	377,495	-
54	2062	2,814,273	1,197,361	1,216,286	232,027	(46,185)	214,784	196,837	377,497	377,497	-
55	2063	2,814,273	1,197,361	1,216,286	232,027	(46,185)	214,784	196,837	377,497	377,497	-
56	2064	2,814,273	1,197,361	1,216,287	232,027	(46,185)	214,782	196,837	377,495	377,495	-
57	2065	2,814,273	1,197,361	1,216,285	232,027	(46,185)	214,785	196,837	377,498	377,498	-
58	2066	2,814,273	1,197,361	1,216,285	232,027	(46,185)	214,784	196,837	377,498	377,498	-
59	2067	2,814,273	1,197,361	1,216,287	232,027	(46,185)	214,783	196,837	377,496	377,496	-
60	2068	2,814,273	1,197,361	1,216,284	232,027	(46,185)	214,785	196,837	377,498	377,498	-
61	2069	2,814,273	1,197,361	1,216,285	232,027	(46,185)	214,785	196,837	377,498	377,498	-
62	GENERATION TOTALS	325,852,852	103,476,567	164,421,575	24,186,839	16,879,598	16,888,274	20,591,941	35,933,332	28,494,468	871,223
63											6,567,642
64	1/Consists of depreciation plus other non-cash expenses and other adjustments and any accounting write-offs included in expenses.										
65	2/Includes adjustments for non-cash revenues or other accrual to cash adjustments.										

Table 8: Generation Revised Revenue Test Income Statement
(\$000s)

		A	B
		2018	2019
1	REVENUES FROM PROPOSED RATES	2,892,061	2,913,059
2	OPERATING EXPENSES		
3	POWER SYSTEM GENERATION RESOURCES		
4	OPERATING GENERATION	702,900	771,694
5	OPERATING GENERATION SETTLEMENTS	22,612	22,997
6	NON-OPERATING GENERATION	1,500	1,534
7	CONTRACTED POWER PURCHASES	98,949	98,549
8	AUGMENTATION POWER PURCHASES	0	12,700
9	EXCHANGES & SETTLEMENTS	318,329	318,343
10	RENEWABLE GENERATION	38,332	39,060
11	GENERATION CONSERVATION	126,267	126,187
13	POWER NON-GENERATION OPERATIONS	95,007	96,459
14	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	210,077	207,093
15	F&W/USF&W/PLANNING COUNCIL	322,107	322,397
16	BPA INTERNAL SUPPORT	86,352	89,291
17	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(84,534)	(85,123)
18	NON-FEDERAL DEBT SERVICE	646,360	410,394
19	DEPRECIATION	142,911	142,860
20	AMORTIZATION	88,504	89,166
21	TOTAL OPERATING EXPENSES	2,815,673	2,663,603
22	INTEREST EXPENSE		
23	INTEREST		
24	APPROPRIATED FUNDS	105,610	103,281
25	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
26	BONDS ISSUED TO U.S. TREASURY	63,663	75,058
27	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
28	NON-FEDERAL INTEREST	11,628	10,747
29	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(6,355)	(6,239)
30	INTEREST CREDIT ON CASH RESERVES	(3,373)	(4,413)
31	NET INTEREST EXPENSE	125,235	132,497
32			
33	TOTAL EXPENSES	2,940,909	2,796,100
34			
35	NET REVENUES	(48,848)	116,959

**Table 9: Generation Revised Revenue Test Statement of Cash Flow
(\$000s)**

		A	B
		2018	2019
1	CASH PROVIDED BY OPERATING ACTIVITIES		
2	NET REVENUES	(48,848)	116,959
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	11,628	10,747
5	DEPRECIATION AND AMORTIZATION	231,415	232,027
	NON-CASH EXPENSES	0	0
6	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
7	NON-CASH REVENUES	(34,124)	(34,124)
8	CASH FLOW ADJUSTMENT (RESERVE)/APPLICATION	(600)	600
9	CASH PROVIDED BY OPERATING ACTIVITIES	113,534	280,272
10			
11	CASH USED FOR INVESTMENT ACTIVITIES		
12	INVESTMENT IN:		
13	FEDERAL UTILITY PLANT (INCLUDING AFUDC)	(334,219)	(328,154)
14	CONSERVATION	0	0
15	FISH & WILDLIFE	(51,000)	(44,000)
16	CASH USED FOR INVESTMENT ACTIVITIES	(385,219)	(372,154)
17			
18	CASH FROM (AND USED FOR) FINANCING ACTIVITIES		
19	INCREASE IN TREASURY DEBT	303,950	318,950
21	REPAYMENT OF TREASURY DEBT	(9,000)	(156,250)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	81,269	53,204
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(77,247)	(67,440)
	REPAYMENT OF NON-FEDERAL OBLIGATIONS	0	0
	CUSTOMER PROCEEDS	0	0
24	PAYMENT OF IRRIGATION ASSISTANCE	(27,234)	(56,573)
25	CASH USED FOR FINANCING ACTIVITIES	271,738	91,891
26			
27	ANNUAL INCREASE (DECREASE) IN CASH	52	9

Table 10: Generation Revenue from Proposed 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 2014	85,655,930	18,971,574	52,260,235	5,723,414	7,536,544	1,164,163	5,120,338	6,283,752	5,521,807	157,944	604,001
3 GENERATION											
4 2015	2,588,858	1,009,924	841,782	224,188	185,925	327,038	192,292	518,581	402,532	61,066	54,983
5 2016	2,847,676	1,140,374	864,192	222,551	185,925	434,633	267,145	651,830	1,053,348	51,482	(453,000)
6 COST EVALUATION PERIOD											
8 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
9 RATE APPROVAL PERIOD											
10		0									
11 2018	2,892,061	1,198,025	1,386,234	231,415	125,235	(48,848)	162,981	113,534	86,247	27,234	52
12 2019	2,913,059	1,197,361	1,234,215	232,027	132,497	116,959	162,713	280,272	223,690	56,573	29
13 REPAYMENT PERIOD											
15 2020	2,913,059	1,197,361	1,183,039	232,027	146,223	154,409	196,837	317,122	197,923	24,317	94,882
16 2021	2,913,059	1,197,361	1,162,870	232,027	149,017	171,785	196,837	334,498	223,989	14,747	95,762
17 2022	2,913,059	1,197,361	1,168,855	232,027	150,964	163,851	196,837	326,564	213,821	16,060	96,683
18 2023	2,913,059	1,197,361	1,166,472	232,027	148,613	168,586	196,837	331,299	220,806	12,846	97,647
19 2024	2,913,059	1,197,361	1,172,871	232,027	149,340	161,460	196,837	324,173	210,401	15,117	98,655
20 2025	2,913,059	1,197,361	1,184,207	232,027	154,521	144,933	196,837	307,656	194,403	13,543	99,711
21 2026	2,913,059	1,197,361	1,180,498	232,027	151,969	151,204	196,837	313,917	192,347	20,755	100,815
22 2027	2,913,059	1,197,361	1,176,424	232,027	156,362	150,885	196,837	313,598	205,509	6,118	101,971
23 2028	2,913,059	1,197,361	1,190,190	232,027	158,153	135,328	196,837	298,041	183,675	11,186	103,180
24 2029	2,913,059	1,197,361	913,927	232,027	148,411	421,333	196,837	584,046	475,536	4,065	104,445
25 2030	2,913,059	1,197,361	1,003,168	232,027	142,308	338,195	196,837	500,908	393,144	1,996	105,769
26 2031	2,913,059	1,197,361	947,912	232,027	134,970	400,789	196,837	563,502	448,407	10,524	104,571
27 2032	2,913,059	1,197,361	835,030	232,027	123,676	524,965	196,837	687,678	581,863	-	105,815
28 2033	2,913,059	1,197,361	803,598	232,027	115,430	646,643	196,837	742,356	616,500	4,347	106,509
29 2034	2,913,059	1,197,361	808,531	232,027	95,183	579,957	196,837	742,670	636,161	-	106,509
30 2035	2,913,059	1,197,361	808,550	232,027	79,839	595,282	196,837	643,725	643,725	7,761	106,509
31 2036	2,913,059	1,197,361	808,614	232,027	59,967	615,090	196,837	777,803	642,374	28,920	106,509
32 2037	2,913,059	1,197,361	807,971	232,027	39,319	636,381	196,837	799,094	676,807	15,778	106,509
33 2038	2,913,059	1,197,361	797,949	232,027	16,692	669,030	196,837	831,743	725,234	-	106,509
34 2039	2,913,059	1,197,361	765,716	232,027	(8,169)	726,124	196,837	888,837	768,147	14,181	106,509
35 2040	2,913,059	1,197,361	763,407	232,027	(32,969)	753,233	196,837	915,946	727,976	-	187,970
36 2041	2,913,059	1,197,361	756,474	232,027	(44,948)	772,146	196,837	934,859	728,435	-	716,423
37 2042	2,913,059	1,197,361	756,473	232,027	(44,948)	772,146	196,837	934,859	728,435	73,659	642,765
38 2043	2,913,059	1,197,361	756,471	232,027	(44,948)	772,149	196,837	934,862	728,435	-	716,426
39 2044	2,913,059	1,197,361	872,137	232,027	(44,445)	655,979	196,837	818,692	728,435	-	600,256
40 2045	2,913,059	1,197,361	1,216,286	232,027	(42,948)	310,333	196,837	473,046	218,435	11,579	243,031
41 2046	2,913,059	1,197,361	1,216,285	232,027	(42,948)	310,334	196,837	473,047	218,435	-	254,611
42 2047	2,913,059	1,197,361	1,216,288	232,027	(42,948)	310,332	196,837	473,045	218,435	-	254,609
43 2048	2,913,059	1,197,361	1,216,285	232,027	(42,948)	310,334	196,837	473,047	218,435	-	254,611
44 2049	2,913,059	1,197,361	1,216,286	232,027	(42,948)	310,333	196,837	473,046	218,435	-	254,611
45 2050	2,913,059	1,197,361	1,216,286	232,027	(42,948)	310,333	196,837	473,046	218,435	-	254,611
46 2051	2,913,059	1,197,361	1,216,285	232,027	(42,948)	310,334	196,837	473,047	218,435	-	254,612
47 2052	2,913,059	1,197,361	1,216,285	232,027	(42,948)	310,334	196,837	473,047	218,435	-	254,611
48 2053	2,913,059	1,197,361	1,216,285	232,027	(42,948)	310,334	196,837	473,047	218,435	-	254,611
49 2054	2,913,059	1,197,361	1,216,286	232,027	(42,948)	310,333	196,837	473,046	218,435	-	254,610
50 2055	2,913,059	1,197,361	1,216,287	232,027	(42,948)	310,333	196,837	473,046	218,435	-	254,610
51 2056	2,913,059	1,197,361	1,216,284	232,027	(42,948)	310,335	196,837	473,048	218,435	-	254,613
52 2057	2,913,059	1,197,361	1,216,284	232,027	(42,948)	310,335	196,837	473,048	218,435	-	254,613
53 2058	2,913,059	1,197,361	1,216,285	232,027	(42,948)	310,334	196,837	473,047	218,435	-	254,613
54 2059	2,913,059	1,197,361	1,216,288	232,027	(45,835)	313,217	196,837	475,930	221,454	-	254,477
55 2060	2,913,059	1,197,361	1,216,288	232,027	(45,967)	313,250	196,837	476,063	218,435	-	257,628
56 2061	2,913,059	1,197,361	1,216,287	232,027	(45,967)	313,350	196,837	476,063	218,435	-	257,628
57 2062	2,913,059	1,197,361	1,216,286	232,027	(45,967)	313,352	196,837	476,065	218,435	-	257,630
58 2063	2,913,059	1,197,361	1,216,286	232,027	(45,967)	313,352	196,837	476,065	218,435	-	257,630
59 2064	2,913,059	1,197,361	1,216,287	232,027	(45,967)	313,351	196,837	476,064	218,435	-	257,628
60 2065	2,913,059	1,197,361	1,216,285	232,027	(45,967)	313,353	196,837	476,066	218,435	-	257,631
61 2066	2,913,059	1,197,361	1,216,285	232,027	(45,967)	313,353	196,837	476,066	218,435	-	257,630
62 2067	2,913,059	1,197,361	1,216,287	232,027	(45,967)	313,351	196,837	476,064	218,435	-	257,629
63 2068	2,913,059	1,197,361	1,216,284	232,027	(45,967)	313,354	196,837	476,067	218,435	-	257,631
64 2069	2,913,059	1,197,361	1,216,285	232,027	(45,967)	313,353	196,837	476,066	218,435	-	257,631
66 GENERATION TOTALS	277,346,990	94,711,551	128,172,637	20,758,805	11,387,755	22,316,243	17,133,300	37,996,023	25,739,591	829,520	11,426,913

1/Consists of depreciation plus other non-cash expenses and other adjustments and any accounting write-offs included in expenses.

2/Includes adjustments for non-cash revenues or other accrual to cash adjustments.

Table 11: 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	2016	12,217,098	-	12,217,098	10,500	1,042,848	4,262,288	7,240,680	502,258	60,184	442,075
2	2017	420,022	-	12,637,120	35,150	222,323	4,424,836	7,559,426	-	50,769	391,306
3	2018	385,219	-	13,022,339	9,000	126,747	4,674,309	7,890,440	-	27,234	364,071
4	2019	372,154	-	13,394,493	156,250	17,940	4,872,273	7,971,572	-	56,573	307,499
5	2020	-	218,435	13,612,929	138,100	6,784	4,945,824	7,938,079	-	24,317	283,181
6	2021	-	218,435	13,831,364	158,000	9,158	4,997,102	7,914,666	-	14,747	268,435
7	2022	-	218,435	14,049,799	82,800	70,589	5,062,148	7,982,589	-	16,060	252,375
8	2023	-	218,435	14,268,235	152,250	5,309	5,123,024	7,875,761	-	12,846	239,529
9	2024	-	218,435	14,486,670	132,950	10,730	5,197,780	7,938,979	-	15,117	224,412
10	2025	-	218,435	14,705,106	74,950	50,895	5,290,371	7,815,974	-	13,543	210,869
11	2026	-	218,435	14,923,541	119,000	-	5,389,806	7,679,222	-	20,755	190,114
12	2027	-	218,435	15,141,976	61,000	69,133	5,478,109	7,713,759	-	6,118	183,996
13	2028	-	218,435	15,360,412	51,000	54,863	5,590,681	7,610,994	-	11,186	172,810
14	2029	-	218,435	15,578,847	56,000	328,074	5,425,042	7,511,009	-	4,065	168,745
15	2030	-	218,435	15,797,283	156,000	150,137	5,337,340	7,631,330	-	1,996	166,749
16	2031	-	218,435	16,015,718	174,000	181,273	5,200,502	7,572,413	-	10,524	156,226
17	2032	-	218,435	16,234,153	112,000	376,577	4,930,360	7,472,336	-	-	156,226
18	2033	-	218,435	16,452,589	158,000	366,351	4,624,445	7,233,937	-	4,347	151,879
19	2034	-	218,435	16,671,024	115,000	420,060	4,307,821	7,297,372	-	-	151,879
20	2035	-	218,435	16,889,460	75,000	459,829	3,991,427	7,392,594	-	7,761	144,117
21	2036	-	218,435	17,107,895	-	528,473	3,681,390	7,564,765	-	28,920	115,197
22	2037	-	218,435	17,326,330	-	556,547	3,343,279	7,625,665	-	15,778	99,419
23	2038	-	218,435	17,544,766	-	599,211	2,962,504	7,667,252	-	-	99,419
24	2039	-	218,435	17,763,201	-	636,084	2,544,855	7,702,687	-	14,181	85,238
25	2040	-	218,435	17,981,637	-	672,993	2,090,297	7,840,366	-	-	85,238
26	2041	-	218,435	18,200,072	-	701,906	1,606,827	7,906,050	-	-	85,238
27	2042	-	218,435	18,418,508	-	649,655	1,175,607	8,026,612	-	73,659	11,579
28	2043	-	218,435	18,636,943	-	745,741	648,301	7,878,569	-	-	11,579
29	2044	-	218,435	18,855,378	-	586,067	280,670	7,983,217	-	-	11,579
30	2045	-	218,435	19,073,814	-	218,435	280,670	8,068,707	-	11,579	-
31	2046	-	218,435	19,292,249	-	218,435	280,670	8,211,294	-	-	-
32	2047	-	218,435	19,510,685	-	218,435	280,670	8,319,419	-	-	-
33	2048	-	218,435	19,729,120	-	218,435	280,670	8,490,855	-	-	-
34	2049	-	218,435	19,947,555	-	218,435	280,670	8,624,290	-	-	-
35	2050	-	218,435	20,165,991	-	218,435	280,670	8,756,119	-	-	-
36	2051	-	218,435	20,384,426	-	218,435	280,670	8,865,644	-	-	-
37	2052	-	218,435	20,602,862	-	218,435	280,670	9,070,153	-	-	-
38	2053	-	218,435	20,821,297	-	218,435	280,670	9,213,002	-	-	-
39	2054	-	218,435	21,039,732	-	218,435	280,670	9,324,303	-	-	-
40	2055	-	218,435	21,258,168	-	218,435	280,670	9,397,249	-	-	-
41	2056	-	218,435	21,476,603	-	218,435	280,670	9,237,103	-	-	-
42	2057	-	218,435	21,695,039	-	218,435	280,670	9,398,527	-	-	-
43	2058	-	218,435	21,913,474	59,216	218,435	221,454	9,557,747	-	-	-
44	2059	-	218,435	22,131,909	3,018	218,435	218,435	9,624,614	-	-	-
45	2060	-	218,435	22,350,345	-	218,435	218,435	9,781,241	-	-	-
46	2061	-	218,435	22,568,780	-	218,435	218,435	9,878,226	-	-	-
47	2062	-	218,435	22,787,216	-	218,435	218,435	9,988,000	-	-	-
48	2063	-	218,435	23,005,651	-	218,435	218,435	10,102,101	-	-	-
49	2064	-	218,435	23,224,086	-	218,435	218,435	10,204,914	-	-	-
50	2065	-	218,435	23,442,522	-	218,435	218,435	10,115,838	-	-	-
51	2066	-	218,435	23,660,957	-	218,435	218,435	10,070,512	-	-	-
52	2067	-	218,435	23,879,393	-	218,435	218,435	9,918,741	-	-	-
53	2068	-	218,435	24,097,828	-	218,435	218,435	9,837,471	-	-	-
54	2069	-	218,435	24,316,263	-	218,435	218,435	9,784,267	-	-	-
55	Totals	\$13,394,493	\$10,921,770	\$999,500,852	\$2,089,184	\$15,107,182	\$123,732,166	\$457,278,654	\$502,258	\$502,258	\$5,230,980

