

BP-18 Rate Proceeding

Final Proposal

Power Revenue Requirement Study

BP-18-FS-BPA-02

July 2017



POWER REVENUE REQUIREMENT STUDY
TABLE OF CONTENTS

	Page
COMMONLY USED ACRONYMS AND SHORT FORMS	iii
1. INTRODUCTION	1
1.1 Purpose of Study	1
1.2 Legal Requirements	3
1.2.1 Governing Authorities	4
1.2.2 Repayment Requirements and Policies	10
2. DEVELOPMENT OF THE GENERATION REVENUE REQUIREMENT	17
2.1 Spending Level Development	17
2.2 Capital Funding	18
2.2.1 Bonds Issued to the U.S. Treasury	19
2.2.2 Federal Appropriations	19
2.2.3 Third-Party Debt	20
2.2.4 Prepayment Program	21
2.3 Debt Optimization Program	21
2.4 Modeling of BPA’s Repayment Obligations	21
2.5 Products Used by Other Studies	23
3. GENERATION REVENUE REQUIREMENT	25
3.1 Revenue Requirement	25
3.2 Current Revenue Test	26
3.3 Revised Revenue Test	26
3.4 Repayment Test at Proposed Rates	27

FIGURE AND TABLES

Figure 1: Generation Revenue Requirement Process ix

Table 1: Projected Net Revenues from Projected Rates31

Table 2: Planned Federal Amortization & Irrigation Assistance Payments31

Table 3: Generation Revenue Requirement Income Statement32

Table 4: Generation Revenue Requirement Statement of Cash Flow.....33

Table 5: Generation Current Revenue Test Income Statement.....34

Table 6: Generation Current Revenue Test Statement of Cash Flow35

Table 7: Generation Revenue from Current Rates – Results Through the Repayment
Period36

Table 8: Generation Revised Revenue Test Income Statement37

Table 9: Generation Revised Revenue Test Statement of Cash Flow38

Table 10: Generation Revenue from Proposed Rates – Results Through the Repayment
Period39

Table 11: Amortization of Generation Investments Over Repayment Period40

1. COMMONLY USED ACRONYMS AND SHORT FORMS

AAC	Anticipated Accumulation of Cash
ACNR	Accumulated Calibrated Net Revenue
ACS	Ancillary and Control Area Services
AF	Advance Funding
AFUDC	Allowance for Funds Used During Construction
aMW	average megawatt(s)
ANR	Accumulated Net Revenues
ASC	Average System Cost
BAA	Balancing Authority Area
BiOp	Biological Opinion
BPA	Bonneville Power Administration
Bps	basis points
Btu	British thermal unit
CIP	Capital Improvement Plan
CIR	Capital Investment Review
CDQ	Contract Demand Quantity
CGS	Columbia Generating Station
CHWM	Contract High Water Mark
CNR	Calibrated Net Revenue
COB	California-Oregon border
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
DDC	Dividend Distribution Clause
<i>dec</i>	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

EIM	Energy imbalance market
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
FOIA	Freedom Of Information Act
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
GSP	Generation System Peak
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
<i>inc</i>	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
IRPL	Incremental Rate Pressure Limiter
IS	Southern Intertie
kcfs	thousand cubic feet per second
kW	kilowatt
kWh	kilowatthour
LDD	Low Density Discount
LGIA	Large Generator Interconnection Agreement
LLH	Light Load Hour(s)
LPP	Large Project Program
LPTAC	Large Project Targeted Adjustment Charge
LTF	Long-term Form

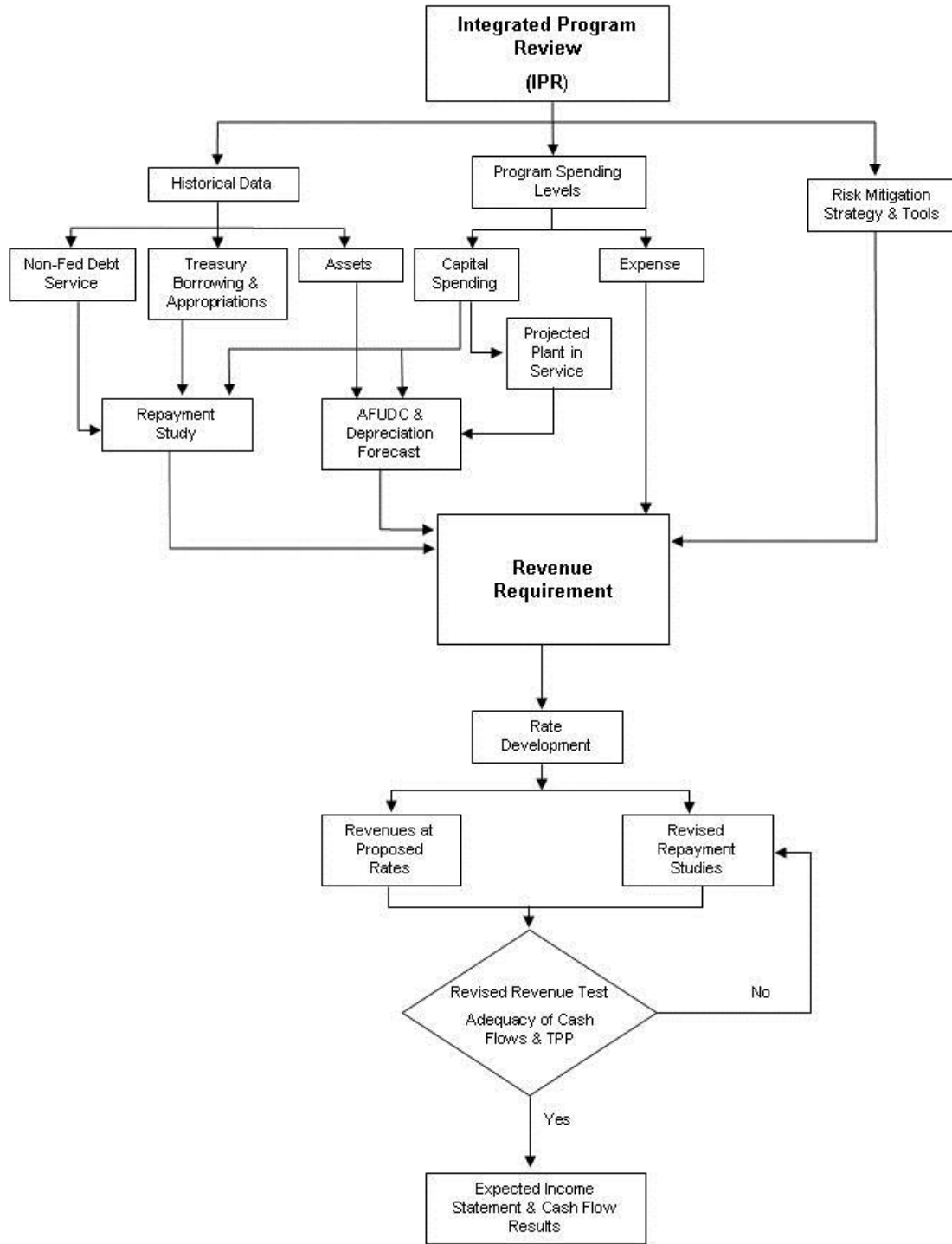
Maf	million acre-feet
Mid-C	Mid-Columbia
MMBtu	million British thermal units
MNR	Modified Net Revenue
MRNR	Minimum Required Net Revenue
MW	megawatt
MWh	megawatthour
NCP	Non-Coincidental Peak
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NFB	National Marine 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
NOB	Nevada-Oregon border
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

This page intentionally left blank.

Figure 1: Generation Revenue Requirement Process



This page intentionally left blank.

1. INTRODUCTION

1.1 Purpose of Study

The purpose of the Power Revenue Requirement Study (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; cost of transmission services necessary for the sale and delivery of FCRPS power; and all other generation-related costs incurred by the Administrator 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) 2017 and the proposed rate period, FY 2018–2019. 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 Bonneville Power Administration's (BPA) transmission function. *See* Transmission Revenue Requirement Study, BP-18-FS-BPA-09.

This Study outlines the policies, forecasts, assumptions, and calculations used to determine the generation revenue requirement. The Power Revenue Requirement Study Documentation,

1 BP-18-FS-BPA-02A, contains key technical assumptions and calculations, the results of the
2 generation repayment studies, and further explanation of the repayment program and its outputs.

3
4 The revenue requirement for this Study is developed using a cost accounting analysis comprised
5 of three parts. First, repayment studies for the generation function are prepared to determine the
6 schedule of amortization payments and to project annual interest expense for bonds and
7 appropriations that fund the Federal investment in hydro generating resources, fish and wildlife
8 recovery, conservation, and other generation assets. Repayment studies are conducted for each
9 year of the rate period and extend over the 50-year repayment period. Second, generation
10 operating expenses and Minimum Required Net Revenues (MRNR) are projected for each year
11 of the rate period. Third, annual Planned Net Revenues for Risk (PNRR) are determined after
12 taking into account risks, BPA's cost recovery goals, and other risk mitigation measures, as
13 described in the Power and Transmission Risk Study, BP-18-FS-BPA-05. From these three
14 steps, the revenue requirement is set at the revenue level necessary to fulfill cost recovery
15 requirements and objectives. This process is depicted in Figure 1. Once the revenue
16 requirement is completed, the costs identified in it are passed to the rate development process,
17 where they are allocated to the appropriate cost pools and used to develop rates in the Power
18 Rates Study (PRS), BP-18-FS-BPA-01.

19
20 Consistent with Department of Energy (DOE) Order RA 6120.2 and the standards on review of
21 BPA's rates applied by the Commission, BPA must demonstrate the adequacy of both current
22 and proposed rates. BPA conducts a current revenue test to determine whether revenues
23 projected from current rates meet cost recovery requirements for the rate period and the
24 repayment period. If the current revenue test indicates that cost recovery and risk mitigation
25 requirements are met, current rates could be extended through the proposed rate approval period.

1 The current revenue test, described in Section 3.2 of this Study, demonstrates that revenues from
2 current rates will not recover the generation revenue requirement for the rate period.

3
4 The revised revenue test, which is performed after calculation of the proposed power rates,
5 determines whether projected revenues from proposed rates meet cost recovery requirements and
6 objectives for the rate test and repayment periods. The revised revenue test, described in
7 Section 3.3 of this Study, demonstrates that revenues from the proposed power rates will recover
8 generation costs in the rate period and over the ensuing 50-year repayment period. In addition,
9 revenues from the proposed rates, together with risk mitigation tools, are sufficient to meet
10 BPA's 95 percent Treasury Payment Probability (TPP) standard that all U.S. Treasury payments
11 will be paid on time and in full, as discussed in the Power and Transmission Risk Study,
12 BP-18-FS-BPA-05.

13
14 Table 1 summarizes the revised revenue test and shows projected net revenues from proposed
15 power rates for FY 2018–2019. These net revenues are the lowest level necessary to achieve
16 BPA's cost recovery objectives, when combined with other risk mitigation tools, given hydro
17 condition uncertainty, market price volatility, and other risks. Table 2 shows planned generation
18 amortization payments to the U.S. Treasury for each year of the rate period and irrigation
19 assistance payments that are due to be paid from power revenues.

20 21 **1.2 Legal Requirements**

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

1 **1.2.1 Governing Authorities**

2 BPA’s revenue requirements are governed primarily by four legislative acts: the Bonneville
3 Project Act of 1937, Pub.L. No. 75-329, 50 Stat. 731; the Flood Control Act of 1944, Pub.L.
4 No. 78-534, 58 Stat. 890, amended 1977; the Federal Columbia River Transmission System Act
5 (Transmission System Act) of 1974, Pub.L. No. 93-454, 88 Stat. 1376; and the Pacific Northwest
6 Electric Power Planning and Conservation Act (Northwest Power Act), Pub.L. No. 96-501,
7 94 Stat. 2697 (1980). The Omnibus Consolidated Rescissions and Appropriations Act of 1996,
8 Pub.L. No. 104-134, 110 Stat. 1321, also guides the development of BPA’s revenue
9 requirements. DOE Order “Power Marketing Administration Financial Reporting,” RA 6120.2,
10 issued by the Secretary of Energy, provides guidance to Federal power marketing
11 administrations regarding repayment of the Federal investment. In addition, policies issued by
12 the Commission provide guidance on separate accounting for transmission system costs. *See,*
13 *e.g., Bonneville Power Admin., 25 FERC ¶ 61,140 (1983).*

14
15 **1.2.1.1 Legal Requirements Governing BPA’s Revenue Requirement**

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

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

24
25 This cost recovery principle was repeated for Army reservoir projects in Section 5 of the Flood
26 Control Act of 1944, 16 U.S.C. § 825s. In 1974, Section 9 of the Transmission System Act,

1 16 U.S.C. § 838g, expanded the cost recovery principle so that BPA’s rates also would be set to
2 recover:

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

10
11 The Northwest Power Act reiterates and clarifies the cost recovery principle. Section 7(a)(1) of
12 the Northwest Power Act, 16 U.S.C. § 839e(a)(1), provides:

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

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

- 3 (A) are sufficient to assure repayment of the Federal investment in the Federal
4 Columbia River Power System over a reasonable number of years after
5 first meeting the Administrator’s other costs;
- 6 (B) are based upon the Administrator’s total system costs; and
- 7 (C) insofar as transmission rates are concerned, equitably allocate the costs of
8 the Federal transmission system between Federal and non-Federal power
9 utilizing such system.

10
11 Development of the revenue requirement is a critical component of meeting the statutory cost
12 recovery principles relevant to BPA. The costs associated with the FCRPS and associated
13 services and expenses, as well as other costs incurred by the Administrator in furtherance of
14 BPA’s mission, are included in this Study.

15 16 **1.2.1.2 The BPA Appropriations Refinancing Act**

17 BPA’s power rates for the FY 2018–2019 rate period will reflect the requirements of the
18 Refinancing Act, 16 U.S.C. § 838l, part of the Omnibus Consolidated Rescissions and
19 Appropriations Act of 1996, Pub.L. No. 104-134, 110 Stat. 1321, enacted in April 1996. The
20 Refinancing Act required that unpaid principal on BPA appropriations (“old capital
21 investments”) at the end of FY 1996 be reset at the present value of the principal and annual
22 interest payments BPA would make to the U.S. Treasury for these obligations absent the
23 Refinancing Act, plus \$100 million. 16 U.S.C. § 838l(b). The Refinancing Act also specified
24 that the new principal amounts of the old capital investments be assigned new interest rates from
25 the Treasury yield curve prevailing at the time of the refinancing transaction. 16 U.S.C.
26 § 838l(a)(6)(A).

1 The Refinancing Act restricted prepayment of the new principal for old capital investments to
2 \$100 million during the first five years after the effective date of the financing. 16 U.S.C.
3 § 8381(e). The Refinancing Act also specifies that repayment dates on new principal amounts
4 may not be earlier than the repayment dates for old capital investments. 16 U.S.C. § 8381(d).
5 The Refinancing Act further directs the Administrator to offer to provide assurance in new or
6 existing contracts for power, transmission, and related services that the Federal Government will
7 not increase the repayment obligations in the future. 16 U.S.C. § 8381(i).

9 **1.2.1.3 Allocation of FCRPS Costs**

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

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

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

24 *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
24 wildlife to the extent affected by the development and operation of any
25 hydroelectric project of the Columbia River and its tributaries

26 16 U.S.C. § 839b(h)(10)(A).

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

7
8 The legislative history of Section 4(h)(10)(C) illustrates how the expenditures by the
9 Administrator for protection, mitigation, and enhancement of fish and wildlife at individual
10 Federal projects in excess of the portion allocable to electric consumers are to be treated as a
11 credit for electric consumers. H.R. Rep. No. 976, 96th Cong., 2d Sess., pt. 2 at 45 (1980),
12 *reprinted in* 1980 U.S.C.C.A.N. 5989, 6011. This principle is satisfied by treating expenditures
13 on behalf of non-power purposes as other project costs. BPA receives a credit against its cash
14 transfers to the U.S. Treasury for expenditures attributable to non-power purposes. BPA's initial
15 funding of all the costs for fish and wildlife has the advantage of avoiding the need for funding
16 the non-power portion of these costs through the annual appropriations process.

17 18 **1.2.1.5 Colville Settlement Act Credits**

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

24
25 The Settlement Agreement obligates BPA to make annual payments to the Colville Tribes.
26 Payments have been tied to BPA's average prices and the amount of annual generation from

1 Grand Coulee Dam. Under the Refinancing Act, part of the Omnibus Consolidated Rescissions
2 and Appropriations Act of 1996, P.L. No. 104-134, 110 Stat. 1321, BPA receives annual credits
3 from the U.S. Treasury against payments due the U.S. Treasury in order to defray a portion of
4 the costs of making payments to the Colville Tribes. The annual payments to the Colville Tribes
5 are forecast to be \$22.6 million in FY 2018 and \$22.9 million in FY 2019. The credits for the
6 FY 2018–2019 rate period are \$4.6 million in each fiscal year.

7 8 **1.2.2 Repayment Requirements and Policies**

9 **1.2.2.1 Separate Repayment Studies**

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

23
24 The Commission approved BPA’s methodology for separate repayment studies in 1984.
25 *Bonneville Power Admin.*, 28 FERC ¶ 61,325 (1984). Thus, BPA has prepared separate
26 repayment studies for its transmission and generation functions since 1984. This standard has

1 enabled BPA to set power and transmission rates separately with minimal change in repayment
2 policy and the process for developing each revenue requirement. This Study incorporates only
3 the repayment study for the generation function for FY 2018–2019.

4 5 **1.2.2.2 Repayment Schedules**

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

10
11 There have been a number of changes in BPA’s repayment policy over the years concurrent with
12 expansion of the Federal system and changing conditions. In general, current repayment criteria
13 were approved by the Secretary of the Interior on April 3, 1963. These criteria were refined and
14 submitted to the Secretary and the Federal Power Commission in support of BPA’s rate filing in
15 September 1965.

16
17 The repayment policy was presented to Congress for its consideration for the authorization of the
18 Grand Coulee Dam Third Powerhouse in June 1966. The underlying theory of repayment was
19 discussed in the House of Representatives’ Report related to authorization of this project,
20 H.R. Rep. No. 89-1409, 2d Sess., at 9–10 (1966). As stated in that report:

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

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

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

10 Chapter 1:

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

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

22
23 To achieve a greater degree of uniformity in repayment policy for all Federal power marketing
24 administrations, the Deputy Assistant Secretary of the Department of the Interior (DOI) issued a
25 memo on August 2, 1972, outlining (1) a uniform definition of the start of the repayment period
26 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:

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

- 1 (2) Pay the cost of obtaining power through purchase and exchange
2 agreements, the cost for transmission services, and other costs during the
3 year in which such costs are incurred;
- 4 (3) Pay interest each year on the unamortized portion of the commercial
5 power investment financed with appropriated funds at the interest rates
6 established for each generating project and for each annual increment of
7 such investment in the BPA transmission system, except that recovery of
8 annual interest expense may be deferred in unusual circumstances for
9 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
16 period” as intended by Congress, except for the Yakima-Chandler
17 Project, which has a legislated amortization period of 66 years);
 - 18 • each annual increment of transmission financed by Federal
19 investments and obligations within the average service life of such
20 transmission facilities (currently 40 years) or within a maximum of
21 50 years, whichever is less (BPA has interpreted RA 6120.2 to
22 require repayment of bonds sold to finance conservation to be
23 within the average service lives of these projects, currently
24 estimated to be five years, and for fish and wildlife facilities to be
25 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. The Refinancing 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; such payments thus are functionalized to generation, consistent with the so-called "Basin Account" concept. Pub.L. No. 89-561, approved on

1 September 7, 1966, amended Pub.L. No. 89-448 to provide several limitations on the repayment
2 of irrigation costs from power revenues. These limitations are:

- 3 (1) the irrigation costs are to be paid from “net revenues” of the power
4 system, with net revenues defined as those revenues over and
5 above the amount needed to cover power costs and previously
6 authorized irrigation payments;
- 7 (2) the construction of new Federal irrigation projects will be
8 scheduled or deferred, if necessary, so that the repayment of the
9 irrigation costs from power revenues will not require an increase in
10 the BPA power rate level; and
- 11 (3) the total amount of irrigation costs to be repaid from power
12 revenues shall not average more than \$30 million per year in any
13 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 2018–2019 rate period, it began in June 2016, when BPA hosted the 2016 Integrated Program Review (IPR) and Capital Investment Review (CIR) workshops. These workshops provided customers and constituents an opportunity to examine, understand, and comment on BPA’s cost projections and capital investments for BPA’s power and transmission functions.

BPA began the 2016 IPR discussion with the release of the IPR initial report and an opening workshop on June 16 containing an overview of Power Services, Transmission Services, and Corporate proposed spending levels for FY 2017–2019 (the cost evaluation period). The initial report and workshop discussed proposed expense spending levels, particularly for the FY 2018–2019 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 2018–2019.

BPA held five days of workshops in June 2016 to discuss the projected capital spending and program 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 2016.

1 After this rate proceeding began, BPA initiated an IPR 2 process for a review of a small number
2 of programs and activities: expense and capital spending by the Corps of Engineers and Bureau
3 of Reclamation, operations and maintenance costs at the Columbia Generation Station, the
4 Commercial Operations Key Strategic Initiative, and workforce spending. Workshops were held
5 in February 2017. A final report detailing reductions in spending forecasts was released in April
6 2017.

7
8 This Study incorporates the spending levels identified in the 2016 IPR final close-out report and
9 the final report of the IPR 2 process, which can be found on BPA’s public website:

10 <https://www.bpa.gov/Finance/FinancialPublicProcesses/IPR/Pages/IPR-2016.aspx>

11 12 **2.2 Capital Funding**

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

- 20 • improvements and maintenance needed to increase reliability, safety, and
21 performance at the CGS nuclear plant;
- 22 • improvements and maintenance needed to improve reliability of the Federal hydro
23 system;
- 24 • investment in fish and wildlife mitigation measures;
- 25 • investment in conservation activities; and
- 26 • 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 the Energy Policy Act of 1992, Pub.L. No. 102-486, 106 Stat.
7 2776, *amending* 16 U.S.C. § 839d-1. These expenditures include a total capital projection of
8 \$625 million, which is comprised of BPA Fish and Wildlife direct program investments
9 (\$95 million), BPA capital equipment (\$21.5 million), and generating resource investments of
10 the Corps and Reclamation (\$509 million) during FY 2018–2019. *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-FS-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 \$210 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
23 rate period. Capital investments funded by this source do not become BPA's obligation to repay
24 until they are placed in service.

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

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

12 13 **2.2.3 Third-Party Debt**

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

20
21 This Study includes an expense adjustment called the Regional Cooperation Debt (RCD) Effect
22 that represents the estimated net revenue requirement effect if BPA and EN were to refinance
23 WNP-1 and WNP-3 debt that is due in 2018 and instead repay higher interest rate Federal
24 appropriations. This transaction is uncertain and thus is not included as a modeling assumption
25 in the rate case. Instead, BPA has estimated the effect that this transaction would have on

1 capital-related costs and included that effect as an undistributed reduction. *See* Power Revenue
2 Requirement Study Documentation, BP-18-FS-BPA-02A, Tables 3H and 3I.

3 4 **2.2.4 Prepayment Program**

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

9 10 **2.3 Debt Optimization Program**

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

15
16 BPA ended the DO program in 2009, and thus no forecasts of DO actions are included in the
17 proposed rates. This Study includes the debt service on EN debt optimization transactions
18 completed through FY 2009.

19 20 **2.4 Modeling of BPA’s Repayment Obligations**

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

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

8
9 Appropriations and bonds are scheduled to be repaid within the expected useful life of the
10 associated facility or 50 years, whichever is less. Corps and Reclamation project replacements
11 funded by appropriations and placed in service in 1994 or later have repayment periods that are
12 set at the weighted average service life of all replacements going into service at that project in
13 that year.

14
15 Bonds issued by BPA to the U.S. Treasury have varying terms, taking into account the estimated
16 average service lives for investments and prudent financing and cash management factors.
17 Generally, bonds are issued with a provision that allows them to be called after a certain time.
18 Bonds may also be issued with no early call provision. Early retirement of eligible bonds may
19 require that BPA pay a bond premium to the U.S. Treasury. Bonds may also be called and
20 repaid at a discount. In addition, the interest rate that BPA pays on callable bonds is higher than
21 the interest rate on non-callable bonds issued at the same time.

22
23 Bonds are issued primarily to finance BPA's Fish and Wildlife Program, and Corps and
24 Reclamation investments that are direct-funded by BPA. These bonds are repaid within the
25 terms and conditions of each bond issued to the U.S. Treasury. Bonds to finance fish and
26 wildlife capital investments are issued with maturities not to exceed 15 years, the same period

1 over which BPA amortizes these capital investments. Corps and Reclamation direct-funding
2 bonds are issued with maturities not to exceed 30 years, although they can be refinanced within
3 the 50-year repayment period.

4
5 Based on these parameters, the repayment study establishes a schedule of planned amortization
6 payments and resulting interest expense by determining the lowest levelized debt service stream
7 necessary to repay all generation obligations within the required repayment period.

8
9 For further discussion of the repayment program, see Power Revenue Requirement Study
10 Documentation, BP-18-FS-BPA-02A, Chapter 13.

11 12 **2.5 Products Used by Other Studies**

13 This Study produces information that is used in other studies. The information provided to the
14 Rate Analysis Model (RAM2018) includes itemized program spending data; the allocation of net
15 interest, MRNR, and PNRR to cost pools; and the allocation of interest income between the
16 Composite cost pool and the Non-Slice cost pool.

This page intentionally left blank.

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

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

9 10 **3.2 Current Revenue Test**

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

16
17 The result of the current revenue test demonstrates that projected revenue from current rates is
18 inadequate to meet the cost recovery criteria of Order RA 6120.2, because the net position is
19 negative for the 2018-2019 rate period. *See* Table 7, column K. If revenues from current rates
20 were adequate, current rates could be extended, although other reasons may exist for revising
21 rates, such as the implementation of a new rate design.

22 23 **3.3 Revised Revenue Test**

24 Consistent with DOE Order RA 6120.2, the adequacy of proposed rates must be demonstrated.
25 The revised revenue test determines whether the revenue projected from proposed rates will meet

1 cost recovery requirements for the rate period. The revised revenue test is conducted using the
2 forecast of revenue under proposed rates. PRS Documentation, BP-18-FS-BPA-01A, Table 9.2.

3
4 For the rate period, the demonstration of the adequacy of proposed rates is shown in Tables 8
5 and 9. Table 9 tests the sufficiency of the resulting net revenues from Table 8 (line 35) for
6 making the planned annual amortization and irrigation assistance payments. The sufficiency of
7 net revenues is demonstrated by the annual increase (decrease) in cash (Table 9, line 27). The
8 annual cash flow must be at least zero to demonstrate the adequacy of the projected revenues to
9 cover all cash requirements.

10
11 The results of the revised revenue test demonstrate that proposed rates are adequate to fulfill the
12 basic cost recovery requirements for the rate period, FY 2018–2019. With the successful test of
13 proposed rates, the rate development process ends.

14 15 **3.4 Repayment Test at Proposed Rates**

16 Table 10, Generation Revenue from Proposed Rates, demonstrates whether projected revenue
17 from proposed rates is adequate to meet the cost recovery criteria of DOE Order RA 6120.2 over
18 the repayment period. The data are presented in a format consistent with the revised revenue
19 tests, Tables 8 and 9, and the separate accounting analysis that is an attachment to the filing with
20 the Commission. The focal point of these tables is the net position (column K), which is the
21 amount remaining after meeting annual expenses requiring cash for the rate period and
22 repayment of the Federal investment. Thus, if the net position is zero or greater in each of the
23 years of the rate period through the repayment period, the projected revenues demonstrate BPA's
24 ability to repay the Federal investment in the FCRPS within the allowable time. As shown in
25 column K, the resulting net position is zero or greater for each year of the rate period and in each
26 year of the repayment period.

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

14
15 Table 11, Amortization of Generation Investments Over Repayment Period, summarizes the
16 amortization of Federal investments over the repayment period. It displays the total investment
17 costs through the cost evaluation period, forecast replacements required to maintain the system
18 through the repayment period, the cumulative dollar amount of investment placed in service,
19 scheduled amortization payments for each year of the repayment period (due and discretionary),
20 unamortized investments including replacements through the repayment period, unamortized
21 obligations as determined by a term schedule (if all obligations were paid at maturity and never
22 early), predetermined amortization payments, and the unamortized amount of irrigation
23 assistance for each year of the repayment period.

TABLES

This page intentionally left blank.

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

		A	B	C
		FY 2018	FY 2019	Average
1	Projected Revenues from Proposed Rates	\$ 2,903,951	\$ 2,897,216	\$ 2,900,584
2	Projected Expenses	<u>2,705,577</u>	<u>2,766,946</u>	<u>2,736,262</u>
3	Net Revenues	\$ 198,374	\$ 130,270	\$ 164,322

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	\$44,150	\$91,070	\$27,234	\$162,454
2	2019	<u>156,250</u>	<u>17,371</u>	<u>56,573</u>	<u>230,194</u>
3	Total	\$200,400	\$108,441	\$83,807	\$392,648
After Amortization Shift					
		A	B	C	D
		Bond	Appropriations	Irrigation	
	Fiscal Year	Amortization	Amortization	Assistance	Total
4	2018	\$44,150	\$69,070	\$27,234	\$140,454
5	2019	<u>156,250</u>	<u>39,372</u>	<u>56,573</u>	<u>252,195</u>
6	Total	\$200,400	\$108,442	\$83,807	\$392,649

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

		A	B
		2018	2019
1	OPERATING EXPENSES		
2	POWER SYSTEM GENERATION RESOURCES		
3	OPERATING GENERATION RESOURCES	703,407	759,721
4	OPERATING GENERATION SETTLEMENT PAYMENTS	22,612	22,997
5	NON-OPERATING GENERATION	1,500	1,534
6	CONTRACTED POWER PURCHASES	100,634	99,621
7	AUGMENTATION POWER PURCHASES	0	12,222
8	EXCHANGES & SETTLEMENTS	317,902	317,916
9	RENEWABLE GENERATION	38,332	39,060
10	GENERATION CONSERVATION	126,267	126,187
11	POWER NON-GENERATION OPERATIONS	90,411	94,319
12	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	215,044	211,640
13	F&W/USF&W/PLANNING COUNCIL	321,821	322,101
14	GENERAL AND ADMINISTRATIVE/SHARED SERVICES	79,353	81,417
15	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(128,728)	(74,168)
16	NON-FEDERAL DEBT SERVICE	490,562	420,704
17	DEPRECIATION	144,092	144,065
18	AMORTIZATION	86,796	87,458
19	TOTAL OPERATING EXPENSES	2,610,006	2,666,794
20			
21	INTEREST EXPENSE:		
22	INTEREST		
23	APPROPRIATED FUNDS	83,294	82,687
24	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
25	BONDS ISSUED TO U.S. TREASURY	56,449	63,302
26	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
27	NON-FEDERAL INTEREST	11,628	10,747
28	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(8,379)	(8,307)
29	INTEREST CREDIT ON CASH RESERVES	<u>(1,392)</u>	<u>(2,205)</u>
30	NET INTEREST EXPENSE	95,662	100,287
31			
32	TOTAL EXPENSES	2,705,668	2,767,081
33			
34	MINIMUM REQUIRED NET REVENUE 1/	220,252	67,984
35	PLANNED NET REVENUE FOR RISK	20,000	20,000
36	PLANNED NET REVENUE, TOTAL (34+35)	240,252	87,984
37			
38	TOTAL REVENUE REQUIREMENT	2,945,919	2,855,065
	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/	220,252	67,984
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	11,628	10,747
5	DEPRECIATION AND AMORTIZATION	230,888	231,524
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	382,706	230,194
11			
12	CASH FROM INVESTMENT ACTIVITIES		
13	INVESTMENT IN:		
14	UTILITY PLANT (INCLUDING AFUDC)	(401,786)	(339,696)
15	ENERGY EFFICIENCY	0	0
16	FISH & WILDLIFE	(51,000)	(44,000)
17	CASH USED FOR INVESTMENT ACTIVITIES	(452,786)	(383,696)
18			
19	CASH FROM BORROWING AND APPROPRIATIONS:		
20	INCREASE IN BONDS ISSUED TO U.S. TREASURY	305,600	319,950
21	REPAYMENT OF BONDS ISSUED TO U.S. TREASURY	(44,150)	(156,250)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	147,186	63,746
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(91,070)	(17,371)
24	REPAYMENT OF NON-FEDERAL OBLIGATIONS	(220,252)	0
25	CUSTOMER PROCEEDS	0	0
26	PAYMENT OF IRRIGATION ASSISTANCE	(27,234)	(56,573)
27	CASH PROVIDED BY BORROWING AND APPROPRIATIONS	70,080	153,502
28			
29	ANNUAL INCREASE (DECREASE) IN CASH	0	0
30			
31	PLANNED NET REVENUE FOR RISK	20,000	20,000
32			
33	TOTAL ANNUAL INCREASE (DECREASE) IN CASH	20,000	20,000
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	2,814,294	2,810,109
2	OPERATING EXPENSES		
3	POWER SYSTEM GENERATION RESOURCES		
4	OPERATING GENERATION	703,407	759,721
5	OPERATING GENERATION SETTLEMENTS	22,612	22,997
6	NON-OPERATING GENERATION	1,500	1,534
7	CONTRACTED POWER PURCHASES	100,634	99,621
8	AUGMENTATION POWER PURCHASES	0	12,222
9	EXCHANGES & SETTLEMENTS	317,902	317,916
10	RENEWABLE GENERATION	38,332	39,060
11	GENERATION CONSERVATION	126,267	126,187
13	POWER NON-GENERATION OPERATIONS	90,411	94,319
14	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	215,044	211,640
15	F&W/USF&W/PLANNING COUNCIL	321,821	322,101
16	BPA INTERNAL SUPPORT	79,353	81,417
17	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(128,728)	(74,168)
18	NON-FEDERAL DEBT SERVICE	490,562	420,704
19	DEPRECIATION	144,092	144,065
20	AMORTIZATION	86,796	87,458
21	TOTAL OPERATING EXPENSES	2,610,006	2,666,794
22	INTEREST EXPENSE		
23	INTEREST		
24	APPROPRIATED FUNDS	83,294	82,687
25	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
26	BONDS ISSUED TO U.S. TREASURY	56,449	63,302
27	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
	NON-FEDERAL INTEREST	11,628	10,747
28	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(8,379)	(8,307)
29	INTEREST CREDIT ON CASH RESERVES	(1,260)	(1,496)
30	NET INTEREST EXPENSE	95,794	100,996
31	TOTAL EXPENSES	2,705,800	2,767,791
32	NET REVENUES	108,494	42,318

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

		A	B
		2018	2019
1	CASH PROVIDED BY OPERATING ACTIVITIES		
2	NET REVENUES	108,494	42,318
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	11,628	10,747
5	DEPRECIATION AND AMORTIZATION	230,888	231,524
	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	270,949	204,529
10			
11	CASH USED FOR INVESTMENT ACTIVITIES		
12	INVESTMENT IN:		
13	FEDERAL UTILITY PLANT (INCLUDING AFUDC)	(401,786)	(339,696)
14	CONSERVATION	0	0
15	FISH & WILDLIFE	(51,000)	(44,000)
16	CASH USED FOR INVESTMENT ACTIVITIES	(452,786)	(383,696)
17			
18	CASH FROM (AND USED FOR) FINANCING ACTIVITIES		
19	INCREASE IN TREASURY DEBT	305,600	319,950
21	REPAYMENT OF TREASURY DEBT	(44,150)	(156,250)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	147,186	63,746
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(91,070)	(17,371)
	REPAYMENT OF NON-FEDERAL OBLIGATIONS	(220,252)	0
	CUSTOMER PROCEEDS	0	0
24	PAYMENT OF IRRIGATION ASSISTANCE	(27,234)	(56,573)
25	CASH USED FOR FINANCING ACTIVITIES	70,080	153,502
26			
27	ANNUAL INCREASE (DECREASE) IN CASH	(111,757)	(25,665)

Table 7: Generation Revenue from Current Rates – Results Through the Repayment Period
(\$000s)

	A	B	C	D	E	F	G	H	I	J	K	
			AND									
	REVENUES	OPERATION & MAINTENANCE	EXCHANGE POWER	DEPRECIATION	NET INTEREST	NET REVENUES	NONCASH EXPENSES 1/	FUNDS FROM OPERATION 2/	AMORTIZATION (REV REQ STUDY DOCUMENTATION)	IRRIGATION AMORTIZATION	NET POSITION	
	(STATEMENT A)	(STATEMENT E)	(STATEMENT E)		(STATEMENT D)	(F=A-B-C-D-E)	(COLUMN D)	(H=F+G)		(STATEMENT C)	(K=H-I)	
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
2												
3	GENERATION											
4	2015	2,588,858	1,009,924	841,782	224,188	185,925	327,038	192,292	585,598	402,532	61,066	122,000
5	2016	2,600,726	1,140,374	864,698	222,551	185,925	187,178	731,095	868,830	1,053,348	51,482	(236,000)
6	COST EVALUATION PERIOD											
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	(143,982)
8	RATE APPROVAL PERIOD											
9	2018	2,814,294	1,147,447	1,231,671	230,888	95,794	108,494	(23,674)	50,697	113,220	27,234	(89,758)
10	2019	2,810,109	1,203,173	1,232,098	231,524	100,996	42,318	196,334	204,529	195,622	56,573	(47,666)
11	REPAYMENT PERIOD											
12	2020	2,810,109	1,203,173	1,167,089	231,524	119,140	89,183	196,334	251,393	167,936	24,317	59,140
13	2021	2,810,109	1,203,173	1,154,154	231,524	123,900	97,358	196,334	259,568	184,801	14,747	60,020
14	2022	2,810,109	1,203,173	1,182,946	231,524	128,065	64,402	196,334	226,612	149,611	16,060	60,941
15	2023	2,810,109	1,203,173	1,155,933	231,524	129,440	90,040	196,334	252,250	177,499	12,846	61,905
16	2024	2,810,109	1,203,173	1,161,351	231,524	131,943	82,118	196,334	244,328	166,298	15,117	62,914
17	2025	2,810,109	1,203,173	1,188,963	231,524	138,379	48,071	196,334	210,281	132,769	13,543	63,969
18	2026	2,810,109	1,203,173	1,161,020	231,524	139,480	74,912	196,334	237,122	151,294	20,755	65,073
19	2027	2,810,109	1,203,173	1,169,785	231,524	143,207	62,420	196,334	224,630	152,283	6,118	66,229
20	2028	2,810,109	1,203,173	1,197,082	231,524	146,275	32,056	196,334	194,266	115,642	11,186	67,438
21	2029	2,810,109	1,203,173	868,534	231,524	153,522	353,356	196,334	515,567	442,799	4,065	68,703
22	2030	2,810,109	1,203,173	949,979	231,524	138,508	286,925	196,334	449,135	449,135	1,996	70,028
23	2031	2,810,109	1,203,173	917,652	231,524	134,033	323,727	196,334	485,937	406,584	10,524	68,830
24	2032	2,810,109	1,203,173	812,793	231,524	120,113	442,507	196,334	604,717	534,643	-	70,074
25	2033	2,810,109	1,203,173	804,648	231,524	116,938	453,827	196,334	616,037	540,922	4,347	70,768
26	2034	2,810,109	1,203,173	809,583	231,524	107,329	458,500	196,334	620,711	549,943	-	70,768
27	2035	2,810,109	1,203,173	799,833	231,524	90,281	485,299	196,334	647,509	568,980	7,761	70,768
28	2036	2,810,109	1,203,173	770,585	231,524	78,013	526,814	196,334	689,025	589,337	28,920	70,768
29	2037	2,810,109	1,203,173	769,942	231,524	60,868	544,602	196,334	706,813	620,267	15,778	70,768
30	2038	2,810,109	1,203,173	759,920	231,524	42,015	573,478	196,334	735,688	664,920	-	70,768
31	2039	2,810,109	1,203,173	727,686	231,524	21,236	626,490	196,334	788,700	703,751	14,181	70,768
32	2040	2,810,109	1,203,173	725,377	231,524	(1,168)	651,203	196,334	813,414	742,646	-	70,768
33	2041	2,810,109	1,203,173	718,444	231,524	(25,137)	682,105	196,334	844,315	773,548	-	70,768
34	2042	2,810,109	1,203,173	718,443	231,524	(40,779)	697,748	196,334	859,959	367,679	73,659	418,620
35	2043	2,810,109	1,203,173	718,441	231,524	(44,096)	701,067	196,334	863,278	218,435	-	644,842
36	2044	2,810,109	1,203,173	836,739	231,524	(43,704)	582,377	196,334	744,587	218,435	-	526,151
37	2045	2,810,109	1,203,173	1,188,787	231,524	(42,537)	229,162	196,334	391,372	218,435	11,579	161,358
38	2046	2,810,109	1,203,173	1,188,786	231,524	(42,537)	229,163	196,334	391,373	218,435	-	172,937
39	2047	2,810,109	1,203,173	1,188,789	231,524	(42,537)	229,161	196,334	391,371	218,435	-	172,935
40	2048	2,810,109	1,203,173	1,188,786	231,524	(42,537)	229,163	196,334	391,373	218,435	-	172,937
41	2049	2,810,109	1,203,173	1,188,787	231,524	(42,537)	229,162	196,334	391,372	218,435	-	172,937
42	2050	2,810,109	1,203,173	1,188,787	231,524	(42,537)	229,162	196,334	391,372	218,435	-	172,937
43	2051	2,810,109	1,203,173	1,188,786	231,524	(42,537)	229,163	196,334	391,373	218,435	-	172,938
44	2052	2,810,109	1,203,173	1,188,786	231,524	(42,537)	229,163	196,334	391,373	218,435	-	172,937
45	2053	2,810,109	1,203,173	1,188,786	231,524	(42,537)	229,163	196,334	391,373	218,435	-	172,937
46	2054	2,810,109	1,203,173	1,188,787	231,524	(42,537)	229,162	196,334	391,372	218,435	-	172,937
47	2055	2,810,109	1,203,173	1,188,787	231,524	(42,537)	229,162	196,334	391,372	218,435	-	172,936
48	2056	2,810,109	1,203,173	1,188,785	231,524	(42,537)	229,164	196,334	391,374	218,435	-	172,939
49	2057	2,810,109	1,203,173	1,188,785	231,524	(42,537)	229,164	196,334	391,374	218,435	-	172,939
50	2058	2,810,109	1,203,173	1,188,786	231,524	(42,537)	229,163	196,334	391,373	218,435	-	172,937
51	2059	2,810,109	1,203,173	1,188,789	231,524	(45,423)	232,046	196,334	394,257	221,454	-	172,803
52	2060	2,810,109	1,203,173	1,188,789	231,524	(45,555)	232,179	196,334	394,389	218,435	-	175,954
53	2061	2,810,109	1,203,173	1,188,788	231,524	(45,555)	232,179	196,334	394,390	218,435	-	175,954
54	2062	2,810,109	1,203,173	1,188,786	231,524	(45,555)	232,181	196,334	394,392	218,435	-	175,956
55	2063	2,810,109	1,203,173	1,188,787	231,524	(45,555)	232,181	196,334	394,391	218,435	-	175,956
56	2064	2,810,109	1,203,173	1,188,788	231,524	(45,555)	232,180	196,334	394,390	218,435	-	175,955
57	2065	2,810,109	1,203,173	1,188,786	231,524	(45,555)	232,182	196,334	394,392	218,435	-	175,957
58	2066	2,810,109	1,203,173	1,188,786	231,524	(45,555)	232,182	196,334	394,392	218,435	-	175,957
59	2067	2,810,109	1,203,173	1,188,788	231,524	(45,555)	232,180	196,334	394,390	218,435	-	175,955
60	2068	2,810,109	1,203,173	1,188,785	231,524	(45,555)	232,183	196,334	394,393	218,435	-	175,957
61	2069	2,810,109	1,203,173	1,188,786	231,524	(45,555)	232,182	196,334	394,392	218,435	-	175,957
62												
63	GENERATION TOTALS	325,406,734	103,722,370	163,033,493	24,160,669	16,848,113	17,642,088	20,809,470	36,972,198	28,159,020	871,223	7,941,955
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	2,903,951	2,897,216
2	OPERATING EXPENSES		
3	POWER SYSTEM GENERATION RESOURCES		
4	OPERATING GENERATION	703,407	759,721
5	OPERATING GENERATION SETTLEMENTS	22,612	22,997
6	NON-OPERATING GENERATION	1,500	1,534
7	CONTRACTED POWER PURCHASES	100,634	99,621
8	AUGMENTATION POWER PURCHASES	0	12,222
9	EXCHANGES & SETTLEMENTS	317,902	317,916
10	RENEWABLE GENERATION	38,332	39,060
11	GENERATION CONSERVATION	126,267	126,187
13	POWER NON-GENERATION OPERATIONS	90,411	94,319
14	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	215,044	211,640
15	F&W/USF&W/PLANNING COUNCIL	321,821	322,101
16	BPA INTERNAL SUPPORT	79,353	81,417
17	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(128,728)	(74,168)
18	NON-FEDERAL DEBT SERVICE	490,562	420,704
19	DEPRECIATION	144,092	144,065
20	AMORTIZATION	86,796	87,458
21	TOTAL OPERATING EXPENSES	2,610,006	2,666,794
22	INTEREST EXPENSE		
23	INTEREST		
24	APPROPRIATED FUNDS	83,294	82,687
25	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
26	BONDS ISSUED TO U.S. TREASURY	56,449	63,302
27	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
28	NON-FEDERAL INTEREST	11,628	10,747
29	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(8,379)	(8,307)
30	INTEREST CREDIT ON CASH RESERVES	<u>(1,483)</u>	<u>(2,341)</u>
31	NET INTEREST EXPENSE	95,571	100,151
32			
33	TOTAL EXPENSES	2,705,577	2,766,946
34			
35	NET REVENUES	198,374	130,270

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

		A	B
		2018	2019
1	CASH PROVIDED BY OPERATING ACTIVITIES		
2	NET REVENUES	198,374	130,270
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	11,628	10,747
5	DEPRECIATION AND AMORTIZATION	230,888	231,524
	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	360,829	292,481
10			
11	CASH USED FOR INVESTMENT ACTIVITIES		
12	INVESTMENT IN:		
13	FEDERAL UTILITY PLANT (INCLUDING AFUDC)	(401,786)	(339,696)
14	CONSERVATION	0	0
15	FISH & WILDLIFE	(51,000)	(44,000)
16	CASH USED FOR INVESTMENT ACTIVITIES	(452,786)	(383,696)
17			
18	CASH FROM (AND USED FOR) FINANCING ACTIVITIES		
19	INCREASE IN TREASURY DEBT	305,600	319,950
21	REPAYMENT OF TREASURY DEBT	(44,150)	(156,250)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	147,186	63,746
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(69,070)	(39,372)
	REPAYMENT OF NON-FEDERAL OBLIGATIONS	(220,252)	0
	CUSTOMER PROCEEDS	0	0
24	PA YMENT OF IRRIGATION ASSISTANCE	(27,234)	(56,573)
25	CASH USED FOR FINANCING ACTIVITIES	92,080	131,501
26			
27	ANNUAL INCREASE (DECREASE) IN CASH	123	40,286

Table 10: Generation Revenue from Proposed Rates – Results Through the Repayment Period
(\$000s)

	A	B	C	D	E	F	G	H	I	J	K
			PURCHASE AND EXCHANGE POWER		NET INTEREST	NET REVENUES	NONCASH EXPENSES 1/	FUNDS FROM OPERATION 2/	AMORTIZATION (REV REQ STUDY DOCUMENTATION)	IRRIGATION AMORTIZATION (STATEMENT C)	NET POSITION (K=H-I-J)
YEAR COMBINED CUMULATIVE	REVENUES (STATEMENT A)	OPERATION & MAINTENANCE (STATEMENT E)	(STATEMENT E)	DEPRECIATION	(STATEMENT D)	(F=A-B-C-D-E)	(COLUMN D)	(H=F+G)			
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
2											
3 GENERATION											
4 2015	2,588,858	1,009,924	841,782	224,188	185,925	327,038	192,292	585,598	402,532	61,066	122,000
5 2016	2,600,726	1,140,374	864,698	222,551	185,925	187,178	731,095	868,830	1,053,348	51,482	(236,000)
6 COST EVALUATION PERIOD											
7 2017	2,766,742	1,119,664	864,698	229,402	124,384	428,595	241,871	828,853	836,999	51,482	(59,627)
8 RATE APPROVAL PERIOD											
9 2018	2,903,951	1,147,447	1,231,671	230,888	95,571	198,374	(57,798)	140,577	113,220	27,234	122
10 2019	2,897,216	1,203,173	1,232,098	231,524	100,151	130,270	162,210	292,481	195,622	56,573	40,286
11 REPAYMENT PERIOD											
12 2020	2,897,216	1,203,173	1,167,089	231,524	116,908	178,522	196,334	340,732	167,936	24,317	148,479
13 2021	2,897,216	1,203,173	1,154,154	231,524	121,668	186,697	196,334	348,907	184,801	14,747	149,359
14 2022	2,897,216	1,203,173	1,182,946	231,524	125,833	153,741	196,334	315,951	149,611	16,060	150,280
15 2023	2,897,216	1,203,173	1,155,933	231,524	127,208	179,379	196,334	341,589	177,499	12,846	151,244
16 2024	2,897,216	1,203,173	1,161,351	231,524	129,711	171,457	196,334	333,667	166,298	15,117	152,253
17 2025	2,897,216	1,203,173	1,188,963	231,524	136,147	137,410	196,334	299,620	132,769	13,543	153,308
18 2026	2,897,216	1,203,173	1,161,020	231,524	137,248	164,251	196,334	326,461	151,294	20,755	154,412
19 2027	2,897,216	1,203,173	1,169,785	231,524	140,975	151,759	196,334	313,969	152,283	6,118	155,568
20 2028	2,897,216	1,203,173	1,197,082	231,524	144,043	121,395	196,334	283,605	115,642	11,186	156,777
21 2029	2,897,216	1,203,173	868,534	231,524	151,290	442,695	196,334	604,906	442,799	4,065	158,042
22 2030	2,897,216	1,203,173	949,979	231,524	136,276	376,264	196,334	538,474	377,112	1,996	159,367
23 2031	2,897,216	1,203,173	917,652	231,524	131,801	413,066	196,334	575,276	406,584	10,524	158,169
24 2032	2,897,216	1,203,173	812,793	231,524	117,881	531,846	196,334	694,056	534,643	-	159,413
25 2033	2,897,216	1,203,173	804,648	231,524	114,706	543,166	196,334	705,376	540,922	4,347	160,107
26 2034	2,897,216	1,203,173	809,583	231,524	105,097	547,839	196,334	710,050	549,943	-	160,107
27 2035	2,897,216	1,203,173	799,833	231,524	88,049	574,638	196,334	736,848	568,980	7,761	160,107
28 2036	2,897,216	1,203,173	770,585	231,524	75,781	616,153	196,334	778,364	589,337	28,920	160,107
29 2037	2,897,216	1,203,173	769,942	231,524	58,636	633,941	196,334	796,152	620,267	15,778	160,107
30 2038	2,897,216	1,203,173	759,920	231,524	39,783	662,817	196,334	825,027	664,920	-	160,107
31 2039	2,897,216	1,203,173	727,686	231,524	19,004	715,829	196,334	878,039	703,751	14,181	160,107
32 2040	2,897,216	1,203,173	725,377	231,524	(3,400)	740,542	196,334	902,753	742,646	-	160,107
33 2041	2,897,216	1,203,173	718,444	231,524	(27,369)	771,444	196,334	933,654	773,548	-	160,107
34 2042	2,897,216	1,203,173	718,443	231,524	(43,011)	787,087	196,334	949,298	767,679	73,659	507,959
35 2043	2,897,216	1,203,173	718,441	231,524	(46,328)	790,406	196,334	952,617	738,435	-	734,181
36 2044	2,897,216	1,203,173	836,739	231,524	(45,936)	671,716	196,334	833,926	718,435	-	615,490
37 2045	2,897,216	1,203,173	1,188,787	231,524	(44,769)	318,501	196,334	480,711	218,435	11,579	250,697
38 2046	2,897,216	1,203,173	1,188,786	231,524	(44,769)	318,502	196,334	480,712	218,435	-	262,276
39 2047	2,897,216	1,203,173	1,188,789	231,524	(44,769)	318,500	196,334	480,710	218,435	-	262,274
40 2048	2,897,216	1,203,173	1,188,786	231,524	(44,769)	318,502	196,334	480,712	218,435	-	262,276
41 2049	2,897,216	1,203,173	1,188,787	231,524	(44,769)	318,501	196,334	480,711	218,435	-	262,276
42 2050	2,897,216	1,203,173	1,188,786	231,524	(44,769)	318,501	196,334	480,711	218,435	-	262,276
43 2051	2,897,216	1,203,173	1,188,786	231,524	(44,769)	318,502	196,334	480,712	218,435	-	262,277
44 2052	2,897,216	1,203,173	1,188,786	231,524	(44,769)	318,502	196,334	480,712	218,435	-	262,276
45 2053	2,897,216	1,203,173	1,188,786	231,524	(44,769)	318,502	196,334	480,712	218,435	-	262,276
46 2054	2,897,216	1,203,173	1,188,787	231,524	(44,769)	318,501	196,334	480,711	218,435	-	262,276
47 2055	2,897,216	1,203,173	1,188,787	231,524	(44,769)	318,501	196,334	480,711	218,435	-	262,275
48 2056	2,897,216	1,203,173	1,188,785	231,524	(44,769)	318,503	196,334	480,713	218,435	-	262,278
49 2057	2,897,216	1,203,173	1,188,785	231,524	(44,769)	318,503	196,334	480,713	218,435	-	262,278
50 2058	2,897,216	1,203,173	1,188,786	231,524	(44,769)	318,502	196,334	480,712	218,435	-	262,278
51 2059	2,897,216	1,203,173	1,188,789	231,524	(47,655)	321,385	196,334	483,596	221,454	-	262,142
52 2060	2,897,216	1,203,173	1,188,789	231,524	(47,787)	321,518	196,334	483,728	218,435	-	265,293
53 2061	2,897,216	1,203,173	1,188,788	231,524	(47,787)	321,518	196,334	483,728	218,435	-	265,293
54 2062	2,897,216	1,203,173	1,188,786	231,524	(47,787)	321,520	196,334	483,731	218,435	-	265,295
55 2063	2,897,216	1,203,173	1,188,787	231,524	(47,787)	321,520	196,334	483,730	218,435	-	265,295
56 2064	2,897,216	1,203,173	1,188,788	231,524	(47,787)	321,519	196,334	483,729	218,435	-	265,294
57 2065	2,897,216	1,203,173	1,188,786	231,524	(47,787)	321,521	196,334	483,731	218,435	-	265,296
58 2066	2,897,216	1,203,173	1,188,786	231,524	(47,787)	321,521	196,334	483,731	218,435	-	265,295
59 2067	2,897,216	1,203,173	1,188,788	231,524	(47,787)	321,519	196,334	483,729	218,435	-	265,294
60 2068	2,897,216	1,203,173	1,188,785	231,524	(47,787)	321,522	196,334	483,732	218,435	-	265,296
61 2069	2,897,216	1,203,173	1,188,786	231,524	(47,787)	321,521	196,334	483,731	218,435	-	265,296
62											
63											
64											
65											
66 GENERATION TOTALS	276,196,083	94,957,354	126,273,073	20,733,535	11,165,023	23,067,098	17,351,728	39,229,778	26,131,713	829,520	12,268,546
67											
	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	2017	12,484,480	-	12,484,480	-	476,940	4,010,280	7,444,812	442,075	50,769	391,306	
2	2018	452,786	-	12,937,266	44,150	91,070	4,327,846	7,808,243	-	27,234	364,071	
3	2019	383,696	-	13,320,962	156,250	17,372	4,537,921	7,900,917	-	56,573	307,499	
4	2020	-	218,435	13,539,398	138,100	6,543	4,611,713	7,867,424	-	24,317	283,181	
5	2021	-	218,435	13,757,833	158,000	2,140	4,670,008	7,844,011	-	14,747	268,435	
6	2022	-	218,435	13,976,268	85,800	37,701	4,764,943	7,908,934	-	16,060	252,375	
7	2023	-	218,435	14,194,704	150,150	-	4,833,228	7,804,206	-	12,846	239,529	
8	2024	-	218,435	14,413,139	132,600	4,879	4,914,185	7,867,774	-	15,117	224,412	
9	2025	-	218,435	14,631,575	74,950	28,520	5,029,150	7,744,769	-	13,543	210,869	
10	2026	-	218,435	14,850,010	119,000	990	5,127,595	7,608,017	-	20,755	190,114	
11	2027	-	218,435	15,068,445	61,000	57,835	5,227,195	7,642,554	-	6,118	183,996	
12	2028	-	218,435	15,286,881	76,000	4,624	5,365,006	7,514,789	-	11,186	172,810	
13	2029	-	218,435	15,505,316	152,000	257,474	5,173,968	7,318,804	-	4,065	168,745	
14	2030	-	218,435	15,723,752	151,000	185,790	5,055,613	7,383,125	-	1,996	166,749	
15	2031	-	218,435	15,942,187	83,000	282,945	4,908,104	7,476,208	-	10,524	156,226	
16	2032	-	218,435	16,160,622	187,389	301,107	4,638,043	7,300,742	-	-	156,226	
17	2033	-	218,435	16,379,058	184,000	319,876	4,352,602	7,036,343	-	4,347	151,879	
18	2034	-	218,435	16,597,493	180,000	330,012	4,061,025	7,034,779	-	-	151,879	
19	2035	-	218,435	16,815,929	82,000	435,208	3,762,253	7,103,000	-	7,761	144,117	
20	2036	-	218,435	17,034,364	-	543,803	3,436,885	7,204,171	-	28,920	115,197	
21	2037	-	218,435	17,252,800	-	569,491	3,085,829	7,231,071	-	15,778	99,419	
22	2038	-	218,435	17,471,235	-	611,840	2,692,425	7,211,658	-	-	99,419	
23	2039	-	218,435	17,689,670	-	648,262	2,262,598	7,300,094	-	14,181	85,238	
24	2040	-	218,435	17,908,106	-	684,639	1,796,394	7,465,772	-	-	85,238	
25	2041	-	218,435	18,126,541	-	712,908	1,301,921	7,584,456	-	-	85,238	
26	2042	-	218,435	18,344,977	-	660,020	860,336	7,733,018	-	73,659	11,579	
27	2043	-	218,435	18,563,412	-	755,389	323,383	7,636,975	-	-	11,579	
28	2044	-	218,435	18,781,847	-	261,149	280,670	7,788,624	-	-	11,579	
29	2045	-	218,435	19,000,283	-	218,435	280,670	7,915,113	-	11,579	-	
30	2046	-	218,435	19,218,718	-	218,435	280,670	8,104,700	-	-	-	
31	2047	-	218,435	19,437,154	-	218,435	280,670	8,253,825	-	-	-	
32	2048	-	218,435	19,655,589	-	218,435	280,670	8,472,261	-	-	-	
33	2049	-	218,435	19,874,024	-	218,435	280,670	8,646,696	-	-	-	
34	2050	-	218,435	20,092,460	-	218,435	280,670	8,778,525	-	-	-	
35	2051	-	218,435	20,310,895	-	218,435	280,670	8,888,050	-	-	-	
36	2052	-	218,435	20,529,331	-	218,435	280,670	9,092,559	-	-	-	
37	2053	-	218,435	20,747,766	-	218,435	280,670	9,235,408	-	-	-	
38	2054	-	218,435	20,966,201	-	218,435	280,670	9,346,709	-	-	-	
39	2055	-	218,435	21,184,637	-	218,435	280,670	9,419,655	-	-	-	
40	2056	-	218,435	21,403,072	-	218,435	280,670	9,259,509	-	-	-	
41	2057	-	218,435	21,621,508	-	218,435	280,670	9,420,933	-	-	-	
42	2058	-	218,435	21,839,943	-	218,435	280,670	9,580,153	-	-	-	
43	2059	-	218,435	22,058,378	-	218,435	280,670	9,647,138	-	-	-	
44	2060	-	218,435	22,276,814	-	218,435	280,670	9,803,765	-	-	-	
45	2061	-	218,435	22,495,249	-	218,435	280,670	9,900,751	-	-	-	
46	2062	-	218,435	22,713,685	-	218,435	280,670	10,010,525	-	-	-	
47	2063	-	218,435	22,932,120	-	218,435	280,670	10,124,625	-	-	-	
48	2064	-	218,435	23,150,555	-	218,435	280,670	10,227,439	-	-	-	
49	2065	-	218,435	23,368,991	-	218,435	280,670	10,138,503	-	-	-	
50	2066	-	218,435	23,587,426	-	218,435	280,670	10,104,154	-	-	-	
51	2067	-	218,435	23,805,862	-	218,435	280,670	10,040,525	-	-	-	
52	2068	-	218,435	24,024,297	-	218,435	280,670	9,893,339	-	-	-	
53	2069	-	218,435	24,242,732	-	218,435	280,670	9,829,593	-	-	-	
54	Totals	\$13,320,962	\$10,921,770		\$2,215,389				\$442,075	\$442,075	\$4,788,906	

