

BP-20 Rate Proceeding

Initial Proposal

Transmission Revenue Requirement Study

BP-20-E-BPA-09

January 2019



TRANSMISSION REVENUE REQUIREMENT STUDY

TABLE OF CONTENTS

	Page
COMMONLY USED ACRONYMS AND SHORT FORMS	iii
1. INTRODUCTION.....	1
1.1 Purpose of the Study	1
1.2 Legal Requirements	4
1.2.1 Governing Authorities	4
1.2.1.1 Legal Requirements Governing BPA’s Revenue Requirement.....	4
1.2.1.2 The BPA Appropriations Refinancing Act	6
1.2.2 Repayment Requirements and Policies.....	7
1.2.2.1 Separate Repayment Studies	7
1.2.2.2 Repayment Schedules	8
2. DEVELOPMENT OF REVENUE REQUIREMENT	13
2.1 Spending Level Development.....	13
2.2 Capital Investments.....	14
2.2.1 Bonds Issued to the Treasury	14
2.2.2 Federal Appropriations	15
2.2.3 Use of Financial Reserves for Capital Investment.....	15
2.2.4 Non-Federal Payment Obligations.....	16
2.2.5 Customer-Financed Projects	17
2.3 Modeling of BPA’s Repayment Obligations	19
2.4 Products Used by Other Studies	20
3. TRANSMISSION REVENUE REQUIREMENTS	21
3.1 Revenue Requirement Format	21
3.2 Current Revenue Test	22
3.3 Revised Revenue Test.....	22
3.4 Repayment Test at Proposed Rates.....	23

Tables

Table 1: Projected Net Revenues from Proposed Rates.....27
Table 2: Planned Repayments to U.S. Treasury27
Table 3: Transmission Revenue Requirement Income Statement28
Table 4: Transmission Revenue Requirement Statement of Cash Flows29
Table 5: Transmission Current Revenue Test Income Statement.....30
Table 6: Transmission Current Revenue Test Statement of Cash Flows.....31
Table 7: Transmission Revenues from Current Rates – Results through the Repayment
Period32
Table 8: Transmission Revised Revenue Test Income Statement33
Table 9: Transmission Revised Revenue Test Statement of Cash Flows34
Table 10: Transmission Revenues from Proposed Rates through the Repayment Period.....35
Table 11: Amortization of Transmission Investments Over Repayment Period36

Figures

Figure 1: Transmission Revenue Requirement Process..... viii

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
CWIP	Construction Work in Progress
CY	calendar year (January through December)
DD	Dividend Distribution
DDC	Dividend Distribution Clause
dec	decrease, decrement, or decremental
DERBS	Dispatchable Energy Resource Balancing Service
DFS	Diurnal Flattening Service
DNR	Designated Network Resource
DOE	Department of Energy
DOI	Department of Interior
DSI	direct-service industrial customer or direct-service industry
DSO	Dispatcher Standing Order
EE	Energy Efficiency

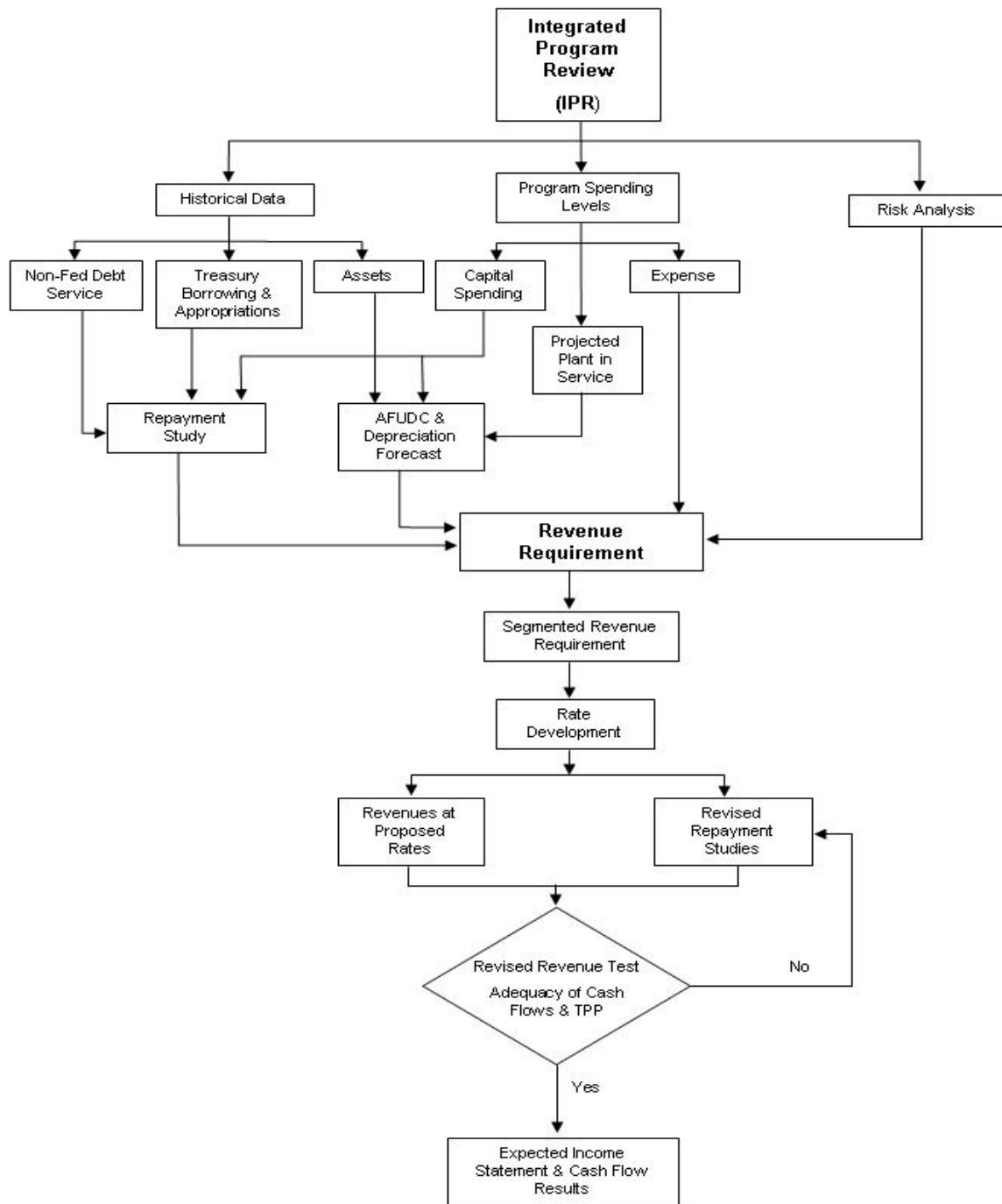
EIM	Energy imbalance market
EIS	Environmental Impact Statement
EN	Energy Northwest, Inc.
ESA	Endangered Species Act
ESS	Energy Shaping Service
e-Tag	electronic interchange transaction information
FBS	Federal base system
FCRPS	Federal Columbia River Power System
FCRTS	Federal Columbia River Transmission System
FELCC	firm energy load carrying capability
FERC	Federal Energy Regulatory Commission
FOIA	Freedom Of Information Act
FORS	Forced Outage Reserve Service
FPS	Firm Power and Surplus Products and Services
FPT	Formula Power Transmission
FRP	Financial Reserves Policy
F&W	Fish & Wildlife
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
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
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
LTF	Long-term Firm
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
NRU	Northwest Requirements Utilities
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
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

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
RDC	Reserves Distribution Clause
REC	Renewable Energy Certificate
Reclamation	U.S. Bureau of Reclamation
REP	Residential Exchange Program
REPSIA	REP Settlement Implementation Agreement
RevSim	Revenue Simulation Model
RFA	Revenue Forecast Application (database)
RHWM	Rate Period High Water Mark
ROD	Record of Decision
RPSA	Residential Purchase and Sale Agreement
RR	Resource Replacement
RRS	Resource Remarketing Service
RSC	Resource Shaping Charge
RSS	Resource Support Services
RT1SC	RHWM Tier 1 System Capability
SCD	Scheduling, System Control, and Dispatch Service
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
VER	Variable Energy Resource
VERBS	Variable Energy Resource 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: Transmission Revenue Requirement Process



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1. INTRODUCTION

1.1 Purpose of the Study

The purpose of the Transmission Revenue Requirement Study is to establish the revenues from transmission and ancillary services that are necessary to recover, in accordance with sound business principles, the Federal Columbia River Transmission System (FCRTS) costs associated with the transmission of electric power. The FCRTS is part of the Federal Columbia River Power System (FCRPS), which also includes the multipurpose generation facilities constructed and operated by the U.S. Army Corps of Engineers (Corps) and the U.S. Bureau of Reclamation (Reclamation) in the Pacific Northwest. The FCRPS costs that are not associated with the FCRTS are funded and repaid through the Bonneville Power Administration's (BPA) power rates. The revenue requirement developed in this study includes recovery of the Federal investment in transmission and transmission-related assets; the operations and maintenance (O&M) and other annual expenses associated with the provision of transmission and ancillary services; the cost of generation inputs for ancillary services and other inter-business line services necessary for the transmission of power; and all other transmission-related costs incurred by BPA.

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 initial proposal filing includes Fiscal Year (FY) 2019 and the proposed rate period, FY 2020–2021. This study is based on transmission revenue requirements that include the results of transmission repayment studies. This study does not include the revenue requirement or a cost recovery demonstration for BPA's power function. *See* Power Revenue Requirement Study, BP-20-E-BPA-02.

1 This Study outlines the policies, forecasts, assumptions, and calculations used to determine the
2 transmission revenue requirement. The Transmission Revenue Requirement Study
3 Documentation, BP-20-E-BPA-09A, contains key technical assumptions and calculations, the
4 results of the transmission repayment studies, and further explanation of the repayment program
5 and its outputs.

6
7 The revenue requirement for this study is developed using a cost accounting analysis comprised
8 of three parts. First, repayment studies for the transmission function are prepared to determine
9 the schedule of amortization payments and to project annual interest expense for bonds and
10 appropriations that fund the Federal investment in transmission and transmission-related assets.
11 Repayment studies are conducted for each year of the rate period and extend over the 35-year
12 repayment period. Second, transmission operating expenses and Minimum Required Net
13 Revenue (MRNR) are projected for each year of the rate period. Third, annual Planned Net
14 Revenues for Risk (PNRR) are determined after taking into account risks, BPA's cost recovery
15 goals, and other risk mitigation measures, as described in the Power and Transmission Risk
16 Study, BP-20-E-BPA-05. From these three steps, the revenue requirement is set at the level
17 necessary to fulfill cost recovery requirements and objectives. This process is depicted in
18 Figure 1, above. Once the revenue requirement is completed, it is segmented and passed to the
19 rate development process, where it is used to develop rates. In the case of a settlement, the
20 segmentation does not occur.

21
22 Consistent with Department of Energy (DOE) Order RA 6120.2 and the standards applied by the
23 Commission on review of BPA's rates, BPA must determine the adequacy of both current and
24 proposed rates to recover the revenue requirement. BPA conducts a current revenue test to
25 determine whether revenues projected from current rates meet cost recovery requirements for the

1 rate period and the repayment period. If the current revenue test indicates that cost recovery and
2 risk mitigation requirements are met, current rates could be extended through the proposed rate
3 approval period. The current revenue test, described in Section 3.2 of this study, demonstrates
4 that revenues from current rates would be adequate to recover the transmission revenue
5 requirement for the rate period (although other reasons may exist for revising rates).

6
7 The revised revenue test, which is performed after calculation of the proposed transmission rates,
8 determines whether projected revenues from proposed rates meet cost recovery requirements for
9 the rate test and repayment periods. The revised revenue test, Section 3.3 of this study,
10 demonstrates that revenues from the proposed transmission rates will recover transmission costs
11 in the rate period and over the ensuing 35-year repayment period. In addition, revenues from the
12 proposed rates, together with risk mitigation tools, are sufficient to meet BPA's 95 percent
13 Treasury Payment Probability standard that all U.S. Treasury payments will be paid on time and
14 in full, as discussed in the Power and Transmission Risk Study, BP-20-E-BPA-05, § 5.2.4.2.

15
16 Table 1 summarizes the revised revenue test and shows projected net revenues from proposed
17 transmission rates for FY 2020–2021. These net revenues are the lowest level sufficient to
18 achieve, in combination with other risk mitigation tools, BPA's cost recovery objectives in the
19 face of transmission-related risks.

20
21 Table 2 shows planned transmission amortization payments to the U.S. Treasury for each year of
22 the rate period.

1 **1.2 Legal Requirements**

2 This section summarizes the statutory framework that guides the development of BPA’s
3 transmission revenue requirement and the recovery of BPA’s transmission costs from the various
4 users of the FCRTS, and the repayment policies BPA follows in the development of its revenue
5 requirement.

6
7 **1.2.1 Governing Authorities**

8 BPA’s revenue requirements are governed primarily by four legislative acts: the Bonneville
9 Project Act of 1937, Pub. L. No. 75-329, 50 Stat. 731, amended 1977; the Flood Control Act of
10 1944, Pub. L. No. 78-534, 58 Stat. 890, amended 1977; the Federal Columbia River
11 Transmission System Act of 1974 (Transmission System Act), Pub. L. No. 93-454,
12 88 Stat. 1376, amended 1977; and the Pacific Northwest Electric Power Planning and
13 Conservation Act (Northwest Power Act), Pub. L. No. 96-501, 94 Stat. 2697. The Omnibus
14 Consolidated Rescissions and Appropriations Act of 1996, Pub. L. No. 104-134, 110 Stat. 1321,
15 also guides the development of BPA’s revenue requirements.

16
17 Department of Energy Order “Power Marketing Administration Financial Reporting,”
18 RA 6120.2, issued by the Secretary of Energy, provides guidance to Federal power marketing
19 administrations regarding repayment of the Federal investment. In addition, policies issued by
20 the Commission provide guidance on separate accounting for transmission system costs.
21 *See, e.g., Bonneville Power Admin., 25 FERC ¶ 61,140 (1983).*

22
23 **1.2.1.1 Legal Requirements Governing BPA’s Revenue Requirement**

24 BPA constructs, operates, and maintains the FCRTS within the Pacific Northwest and makes
25 improvements or replacements to the transmission system as are appropriate and required to

1 (a) integrate and transmit electric power from existing or additional Federal or non-Federal
2 generating units; (b) provide service to BPA customers; (c) provide inter-regional transmission
3 facilities; and (d) maintain the electrical stability and reliability of the Federal system.

4 Transmission System Act § 4, 16 U.S.C. § 838b.

5
6 BPA's rates must be set to ensure that revenues are sufficient to recover costs. This requirement
7 was first set forth in Section 7 of the Bonneville Project Act, 16 U.S.C. § 832f , which provides
8 that

9 [r]ate schedules shall be drawn having regard to the recovery (upon the basis of
10 the application of such rate schedules to the capacity of the electric facilities of
11 [the] Bonneville project) of the cost of producing and transmitting such electric
12 energy, including the amortization of the capital investment over a reasonable
13 period of years.

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

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

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

27 [t]he Administrator shall establish, and periodically review and revise, rates for
28 the sale and disposition of electric energy and capacity and for the transmission of
29 non-Federal power. Such rates shall be established and, as appropriate, revised to
30 recover, in accordance with sound business principles, the costs associated with

1 the acquisition, conservation, and transmission of electric power, including the
2 amortization of the Federal investment in the Federal Columbia River Power
3 System (including irrigation costs required to be repaid out of power revenues)
4 over a reasonable period of years and the other costs and expenses incurred by the
5 Administrator pursuant to this chapter and other provisions of law. Such rates
6 shall be established in accordance with Sections 9 and 10 of the Federal Columbia
7 River Transmission System Act (16 U.S.C. § 838), Section 5 of the Flood Control
8 Act of 1944, and the provisions of this chapter.

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

- 11 (A) are sufficient to assure repayment of the Federal investment in the Federal
12 Columbia River Power System over a reasonable number of years after
13 first meeting the Administrator's other costs;
- 14 (B) are based upon the Administrator's total system costs; and
- 15 (C) insofar as transmission rates are concerned, equitably allocate the costs of
16 the Federal transmission system between Federal and non-Federal power
17 utilizing such system.

18
19 Development of the revenue requirement is a critical component of meeting the statutory cost
20 recovery principles relevant to BPA. The costs associated with the FCRTS and associated
21 services and expenses, as well as other costs incurred by the Administrator in furtherance of
22 BPA's mission, are included in the study.

24 **1.2.1.2 The BPA Appropriations Refinancing Act**

25 As in the last rate period, BPA's transmission rates for the FY 2020–21 rate period will reflect
26 the requirements of the Refinancing Act, 16 U.S.C. § 838l, part of the Omnibus Consolidated
27 Rescissions and Appropriations Act of 1996, Pub. L. No. 104-134, 110 Stat. 1321, enacted in
28 April 1996. The Refinancing Act required that unpaid principal on BPA appropriations ("old

1 capital investments”) at the end of FY 1996 be reset at the present value of the principal and
2 annual interest payments BPA would make to the U.S. Treasury for these obligations absent the
3 Refinancing Act, plus \$100 million. 16 U.S.C. § 838l(b). The Refinancing Act also specified
4 that the new principal amounts of the old capital investments be assigned new interest rates from
5 the U.S. Treasury yield curve prevailing at the time of the refinancing transaction. 16 U.S.C.
6 § 838l(a)(6)(A).

7
8 The Refinancing Act restricted prepayment of the new principal for old capital investments to
9 \$100 million during the first five years after the effective date of the financing. 16 U.S.C.
10 § 838l(e). The Refinancing Act also specifies that repayment dates on new principal amounts
11 may not be earlier than the repayment dates for old capital investments. 16 U.S.C. § 838l(d).
12 The Refinancing Act further directs the Administrator to offer to provide assurance in new or
13 existing contracts for power, transmission, or related services that the Government will not
14 increase the repayment obligations in the future. 16 U.S.C. § 838l(i).

15 16 **1.2.2 Repayment Requirements and Policies**

17 **1.2.2.1 Separate Repayment Studies**

18 Section 10 of the Transmission System Act, 16 U.S.C. § 838h, and Section 7(a)(2)(C) of the
19 Northwest Power Act, 16 U.S.C. § 839e(a)(2)(C), provide that the recovery of the costs of the
20 Federal transmission system shall be equitably allocated between Federal and non-Federal power
21 utilizing such system. In 1982, the Commission first directed BPA to provide accounting and
22 repayment statements for its transmission system separate and apart from the accounting and
23 repayment statements for the Federal generation system. *Bonneville Power Admin.*, 20 FERC
24 ¶ 61,142 (1982). The Commission required BPA to establish books of account for the FCRTS
25 separate from its generation books of account; explained that the FCRTS shall be comprised of

1 all investments, including administrative and management costs, related to the transmission of
2 electric power; and directed BPA to develop repayment studies for its transmission function
3 separate from those for its generation function. Such studies must set forth the date of each
4 investment, the repayment date, and the amount repaid from transmission revenues. *Bonneville*
5 *Power Admin.*, 26 FERC ¶ 61,096 (1984).

6
7 The Commission approved BPA's methodology for separate repayment studies in 1984.
8 *Bonneville Power Admin.*, 28 FERC ¶ 61,325 (1984). Thus, BPA has prepared separate
9 repayment studies for its transmission and generation functions since 1984. This methodology
10 has enabled BPA to set power and transmission rates separately with minimal change in
11 repayment policy and the process for developing each revenue requirement. This study
12 incorporates only the repayment study for the transmission function for FY 2020–2021.

13 14 **1.2.2.2 Repayment Schedules**

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

19
20 There have been a number of changes in BPA's repayment policy over the years concurrent with
21 expansion of the Federal system and changing conditions. In general, current repayment criteria
22 were approved by the Secretary of the Interior on April 3, 1963. These criteria were refined and
23 submitted to the Secretary and the Federal Power Commission (the predecessor agency to the
24 Federal Energy Regulatory Commission) in support of BPA's rate filing in September 1965.

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

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

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

16
17 The Secretary of the Interior issued a statement of power policy on September 30, 1970, setting
18 forth general principles that reaffirmed the repayment policy as previously developed. The most
19 pertinent of these principles were set forth in the Department of the Interior Manual, Part 730,

20 Chapter 1:

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

26 B. Electric power generated at Federal projects will be marketed at the lowest
27 rates consistent with sound financial management. Rates for the sale of
28 Federal electric power will be reviewed periodically to assure their
29 sufficiency to repay operating and maintenance costs and the capital
30 investment within 50 years with interest that more accurately reflects the
31 cost of money.

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

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

15
16 On March 22, 1976, the DOI issued Chapter 4 of Part 730 of the DOI Manual to codify financial
17 reporting requirements for the Federal power marketing administrations; it describes standard
18 policies and procedures for preparing system repayment studies.

19
20 BPA and the other Federal power marketing agencies were transferred to the newly established
21 Department of Energy on October 1, 1977. Department of Energy Organization Act, 42 U.S.C.
22 § 7101 *et seq.* The DOE adopted the policies set forth in Part 730 of the DOI Manual by issuing
23 Interim Management Directive No. 1701 on September 28, 1977, which subsequently was
24 replaced by RA 6120.2, issued on September 20, 1979, and amended on October 1, 1983.

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

- 3 (1) Pay all annual costs of operating and maintaining the Federal power
4 system;
- 5 (2) Pay the cost of obtaining power through purchase and exchange
6 agreements, the cost for transmission services, and other costs during the
7 year in which such costs are incurred;
- 8 (3) Pay interest each year on the unamortized portion of the commercial
9 power investment financed with appropriated funds at the interest rates
10 established for each generating project and for each annual increment of
11 such investment in the BPA transmission system, except that recovery of
12 annual interest expense may be deferred in unusual circumstances for
13 short periods of time;
- 14 (4) Pay when due the interest and amortization portion on outstanding bonds
15 sold to the U.S. Treasury;
- 16 (5) Repay:
 - 17 • each dollar of power investments and obligations in the FCRPS
18 generating projects within 50 years after the projects become
19 revenue-producing (50 years has been deemed a "reasonable
20 period" as intended by Congress, except for the Yakima-Chandler
21 Project, which has a legislated amortization period of 66 years);
 - 22 • each annual increment of transmission financed by Federal
23 investments and obligations within the average service life of such
24 transmission facilities (currently 40 years) or within a maximum of
25 50 years, whichever is less (BPA has interpreted RA 6120.2 to

1 require repayment of bonds sold to finance conservation to be
2 within the average service lives of these projects, currently
3 estimated to be five years, and for fish and wildlife facilities to be
4 15 years);

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

- 7 (6) As required by Pub. L. No. 89-448, § 2, repay the portion of construction
8 costs at Federal reclamation projects that is beyond the repayment ability
9 of the irrigators, and which is assigned for repayment from commercial
10 power revenues, within the same overall period available to the irrigation
11 water users for making their payments on construction costs.

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

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

1 includes forecasts of net interest expense and depreciation and amortization expense, which
2 includes amortization of the terminated I-5 reinforcement project.

3
4 After considering the comments received, BPA released a final IPR close-out report in October
5 2018.

6
7 This study incorporates the spending levels identified in the 2018 IPR and CIR final close-out
8 report, which can be found on BPA’s public website:

9 <https://www.bpa.gov/Finance/FinancialPublicProcesses/IPR/Pages/IPR-2018.aspx>

10 11 **2.2 Capital Investments**

12 The forecast of BPA’s capital investments for FY 2020–2021 used in developing the BP-20
13 transmission initial proposal rates was produced from the CIR levels in the IPR/CIR close-out
14 reports. The following section describes the capital investment forecasts.

15
16 BPA transmission capital outlay projections including allowance for funds used during
17 construction (AFUDC) for the FY 2020–2021 rate period are \$927 million, excluding the effect
18 of reserve financing, which reduces the borrowing amount. Rounded, these investments are:

- 19 • transmission programs (\$896 million)
- 20 • environmental program (\$14 million)
- 21 • corporate capital program (\$18 million)

22 Transmission Revenue Requirement Study Documentation, BP-20-E-BPA-09A, Ch. 7.

23 24 **2.2.1 Bonds Issued to the Treasury**

25 Bonds issued to the U.S. Treasury will be one of the primary sources of capital used to finance
26 projected FY 2020–2021 transmission capital program investments. Interest rates on bonds

1 issued by BPA to the U.S. Treasury are set at market interest rates comparable to the interest
2 rates for securities issued by other agencies of the U.S. Government. For interest rates on bonds
3 projected to be issued, see *id.*, Ch. 6.
4

5 **2.2.2 Federal Appropriations**

6 This study includes the outstanding balances of the original capital investments in the Federal
7 transmission system that was financed by Congressional appropriations. After the full
8 implementation of BPA's self-funding authority under the Transmission System Act,
9 transmission investments were no longer funded by annual appropriations. The Refinancing Act
10 reset the unpaid principal of all outstanding BPA appropriations and assigned current market
11 interest rates to the principal. New principal amounts were established at the beginning of
12 FY 1997 at the present value of the principal and annual interest payments BPA would make to
13 the Treasury for these obligations in the absence of the Refinancing Act, plus \$100 million.
14 Before implementation of the Refinancing Act, \$1,461.9 million in BPA appropriations was
15 outstanding. After implementation of the Refinancing Act, \$1,075.4 million in BPA
16 appropriations was outstanding. The Refinancing Act restricted prepayment of the new principal
17 to \$100 million in FY 1997–2001. Other repayment terms were unaffected. Through annual
18 repayments, outstanding appropriations for transmission investments had been reduced to
19 \$7 million as of September 30, 2017 after the annual treasury payment had been made.
20

21 **2.2.3 Use of Current Revenues for Capital Investment**

22 As a means to fund capital investments in lieu of borrowing, the revenue requirement assumes
23 that \$23 million per year of the capital program is funded with current revenues.
24
25

1 **2.2.4 Non-Federal Payment Obligations**

2 The transmission revenue requirements reflect two forms of non-Federal payment obligations.
3 The first is lease purchase arrangements for assets. BPA entered into a transaction in 2004 with
4 the Northwest Infrastructure Financing Corporation (NIFC), a subsidiary of JH Management, to
5 provide for the construction of the 500-kV Schultz-Wautoma transmission line (Schultz-
6 Wautoma line). NIFC issued bonds to finance the construction. BPA is making semiannual
7 lease payments to NIFC through 2034, concluding with a single payment for the principal due on
8 the bonds.

9
10 Payment of the debt incurred by NIFC to construct the line is secured solely by BPA's revenues.
11 During the term of the lease, BPA will operate the Schultz-Wautoma line and provide
12 transmission and ancillary services over the facilities. Since the completion of the
13 Schultz-Wautoma project, BPA has entered into additional lease financing arrangements with
14 NIFC, Port of Morrow, and Idaho Energy Resources Authority. BPA will continue to utilize the
15 lease purchase program for transmission construction. The revenue requirement includes all
16 transactions BPA expects to complete by the date of the Final Proposal.

17
18 The second form of non-Federal payment obligations included in the revenue requirement is the
19 functional reassignment to Transmission Services of debt service (interest and principal)
20 payment obligations associated with non-Federal Energy Northwest (EN) bonds. This
21 reassignment is a result of BPA's Debt Optimization Program (DOP), which refinances and
22 repays existing EN bonds before they come due and uses the revenues made available from such
23 refinancing to replenish or create opportunities to replenish BPA's Treasury borrowing authority
24 by retiring additional Treasury obligations in amounts equal to the principal of the new EN
25 bonds. When Treasury obligations associated with transmission investments are repaid under

1 DOP, the debt service obligation associated with new EN debt in equivalent principal amounts is
2 assigned to Transmission Services. The revenue requirements reflect refinancing actions that
3 have occurred through FY 2009, when DOP ended. The revenue requirement does not include
4 forecasts of additional refinancing activities during the rate period.

5
6 For specific calculations regarding non-Federal payment obligations, see *id.*, Ch. 8.

7 8 **2.2.5 Customer-Financed Projects**

9 The revenue requirements also reflect the impacts of customer-financed projects. Customers
10 have financed two types of capital construction projects. The first form of customer financing
11 occurs under generation interconnection agreements (LGIA or SGIA). BPA amended its Open
12 Access Transmission Tariff and adopted the LGIA and SGIA in voluntary compliance with
13 Commission Order Nos. 2003 and 2006. Under the generator interconnection agreements,
14 interconnection customers finance the cost of Network Upgrades (facilities at or beyond the
15 point at which the customer's interconnection facilities connect to BPA's transmission system)
16 needed to interconnect their generating facilities to BPA's transmission system if BPA, as the
17 transmission owner/provider, does not provide the funding. BPA requires the interconnection
18 customer to advance funds in an amount sufficient to cover the cost of construction. These
19 advance funds, with interest on the outstanding balance, are then returned to the interconnection
20 customer in the form of transmission credits. These credits either offset charges for eligible
21 transmission service in the customer's bill or are provided as monthly cash payments based on
22 the generating facility's capacity and its plant capacity factor.

23
24 The second form of customer-financed projects is the customer-financed upgrade on the
25 California-Oregon Intertie (COI). The COI upgrade increases COI and Pacific Direct-Current

1 Intertie (PDCI) availability so that BPA will be able to support requests for long-term firm
2 transmission service up to the full rating of the COI and PDCI. Like the advance funds provided
3 under generator interconnection agreements, the advance funds provided by customers for the
4 COI upgrade, with interest, will be returned to customers in the form of transmission credits that
5 offset eligible charges for transmission service. These credits will have been fully repaid before
6 the beginning of the BP-20 rate period.

7
8 These customer-financed transactions and the associated transmission credits affect several areas
9 of the revenue requirement. Depreciation of the associated assets appears in total transmission
10 depreciation. The interest that accrues on the outstanding credit balances is included in non-
11 Federal interest, a component of the net interest calculation on the income statement. Both of
12 these items increase transmission expenses. These items also appear in the statement of cash
13 flows, because they are non-cash expenses. In addition, the revenues associated with customer-
14 financed projects for which customers receive credits affect the statement of cash flows because
15 they are non-cash revenues—they provide no cash for cost recovery. Therefore, they generally
16 increase the need for MRNR, which is added to the income statement if necessary, to ensure that
17 all cash requirements are met.

18
19 Non-cash expenses (depreciation and interest on outstanding credit balances) offset non-cash
20 revenues and decrease the need for MRNR. The non-cash expenses are subtracted from the non-
21 cash revenues. If the difference is positive, meaning that non-cash revenues exceed non-cash
22 expenses, the need for MRNR increases. If the difference is negative, meaning that non-cash
23 expenses exceed non-cash revenues, the need for MRNR decreases.

2.3 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 transmission repayment studies, that period is 35 years. This study horizon reflects the fact that bonds are not issued for terms longer than 35 years and that the outstanding appropriations and bonds that finance the transmission system are fully repaid within this period. This study horizon is also appropriate in that it does not exceed the estimated average service life of transmission system plant (45 years).

In conducting the repayment studies, BPA includes as fixed inputs the annual debt service payments associated with its non-federal capitalized contract obligations and the fixed annual payments associated with long-term energy resource acquisition contracts. All outstanding and projected transmission repayment obligations for appropriated investments and bonds issued to the U.S. Treasury are included to be scheduled for repayment. Forecast transmission repayment obligations related to the lease purchase program are also modeled and scheduled for repayment. Funding for replacements projected during the repayment period is also included in the repayment study, consistent with the requirements of DOE Order RA 6120.2.

Appropriations and bonds are scheduled to be repaid within the expected useful life of the associated facility, or the maximum repayment period (50 years for generation and 35 years for transmission), whichever is less. 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

1 cash management factors. Projected lease purchase obligations assumed in the repayment study
2 are held to the same parameters.

3
4 In the repayment studies, all projected bonds are issued with maturities not to exceed 30 years
5 for transmission investment, although they can be refinanced within the 35-year repayment
6 period. Environmental investments have a maximum term of 15 years. Corporate investments,
7 generally for information technology, are for a five-year period. Generally bonds are issued with
8 a provision that allows the bonds to be called any time. Bonds also may be issued with
9 provisions such as a five-year call or a no call provision. Early retirement of eligible bonds may
10 require that BPA pay a bond premium to the Treasury. Bonds may also be called and repaid at a
11 discount. Bonds are issued to finance BPA transmission, environment, and corporate
12 investments and are repaid within the provisions of each bond agreement with the Treasury.

13
14 Based on these parameters, the repayment study establishes a schedule of planned amortization
15 payments and resulting interest expense by determining the lowest levelized debt service stream
16 necessary to repay all transmission obligations within the required repayment period.

17 For further discussion of the repayment program, see Transmission Revenue Requirement Study
18 Documentation, BP-20-E-BPA-09A, Ch. 14.

19 20 **2.4 Products Used by Other Studies**

21 Due to the settlement, no other products have been produced.
22
23
24
25

1 cash (line 24). The MRNR amount shown on the Statement of Cash Flows (line 2) then is
2 incorporated in the Income Statement (Table 3, line 22).

3 4 **3.2 Current Revenue Test**

5 Consistent with DOE Order RA 6120.2, the continuing adequacy of existing rates must be tested
6 annually. The current revenue test, exhibited in Tables 5 and 6, determines whether the revenue
7 expected from current rates will meet cost recovery requirements during the FY 2020–2021 rate
8 period and the ensuing repayment period. For revenue at current rates, see Transmission
9 Revenue Requirement Study Documentation, BP-20-E-BPA-09A, Table 13-1.

10
11 The result of the current revenue test demonstrates that projected revenue from current rates is
12 adequate to meet the cost recovery criteria of Order RA 6120.2 over the repayment period,
13 because the net position is positive. *See* Table 7, column K. This means that current rates could
14 be extended (although other reasons may exist for revising rates).

15 16 **3.3 Revised Revenue Test**

17 Consistent with DOE Order RA 6120.2, the adequacy of proposed rates must be demonstrated.
18 The revised revenue test determines whether the revenue projected from proposed rates will meet
19 cost recovery requirements for the rate period. The revised revenue test is conducted using the
20 forecast of revenue under proposed rates. Transmission Revenue Requirement Study
21 Documentation, BP-20-E-BPA-09A, Table 13-2.

22
23 For the rate period, the demonstration of the adequacy of proposed rates is shown in Tables 8
24 and 9. Table 9 tests the sufficiency of the resulting net revenues from Table 8, line 23, for
25 making the planned annual amortization payments. The sufficiency of net revenues is

1 demonstrated by the annual increase (or decrease) in cash (Table 9, line 25). The annual cash
2 flow must be at least zero to demonstrate the adequacy of the projected revenues to cover all
3 cash requirements.

4
5 The results of the revised revenue test demonstrate that proposed rates are adequate to fulfill cost
6 recovery requirements for the rate period, FY 2020–2021. With the successful test of proposed
7 rates, the rate development process ends.

8 9 **3.4 Repayment Test at Proposed Rates**

10 Table 10, Transmission Revenues from Proposed Rates, demonstrates whether projected revenue
11 from proposed rates is adequate to meet the cost recovery criteria of DOE Order RA 6120.2 over
12 the repayment period. The data are presented in a format consistent with the revised revenue
13 tests, Tables 8 and 9, and the separate accounting analysis that is an attachment to the rate filing
14 BPA submits to the Commission. The focal point of Table 10 is the net position (column K),
15 which is the amount of funds provided by revenues that remain after meeting annual expenses
16 requiring cash for the rate period and repayment of the Federal investment. Thus, if the net
17 position is zero or greater in each of the years of the rate period through the repayment period,
18 the projected revenues demonstrate BPA’s ability to repay the Federal investment in the FCRPS
19 within the allowable time. As shown in column K, the resulting net position is zero or greater for
20 each year of the rate period and in each year of the repayment period.

21
22 The historical data on this table have been taken from BPA’s separate accounting analysis. The
23 rate period data have been developed specifically for this study. The repayment period data are
24 presented consistent with the requirements of DOE Order RA 6120.2.

1 Table 11, Amortization of Transmission 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 investments 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), and the 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 Proposed Rates
(\$000s)

	A	B	C
	2020	2021	Rate Period Average
1 PROJECTED REVENUES FROM PROPOSED RATES	1,074,674	1,107,214	1,090,944
2 PROJECTED EXPENSES	<u>1,057,512</u>	<u>1,079,988</u>	<u>1,068,750</u>
3 NET REVENUES	17,162	27,225	22,194

Table 2: Planned Repayments to U.S. Treasury
(\$000s)

		After Amortization Shift		
		A	B	C
		BOND	APPROPRIATIONS	
		AMORTIZATION	AMORTIZATION	TOTAL
1	2020	205,766	-	205,766
2	2021	<u>220,674</u>	-	<u>220,674</u>
3	TOTAL	426,440	-	426,440

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

	A	B
	2020	2021
1 OPERATING EXPENSES		
2 TRANSMISSION OPERATIONS	168,490	163,854
3 TRANSMISSION ENGINEERING	44,127	49,484
4 TRANSMISSION MAINTENANCE	173,074	173,283
5 TRANSMISSION ACQUISITION & ANCILLARY SERVICES	113,914	113,914
6 BPA INTERNAL SUPPORT	92,528	93,884
7 OTHER INCOME, EXPENSES & ADJUSTMENTS	(29,000)	(29,000)
8 DEPRECIATION & AMORTIZATION	<u>345,584</u>	<u>352,560</u>
9 TOTAL OPERATING EXPENSES	908,717	917,979
10 INTEREST EXPENSE		
11 INTEREST EXPENSE		
12 FEDERAL APPROPRIATIONS	-	-
13 CAPITALIZATION ADJUSTMENT	(18,968)	(18,968)
14 ON LONG-TERM DEBT	103,595	114,356
15 AMORTIZATION OF CAPITALIZED BOND PREMIUMS	559	559
16 DEBT SERVICE REASSIGNMENT INTEREST	4,880	3,943
17 NON-FEDERAL INTEREST	82,864	85,927
18 PREMIUMS/DISCOUNTS	-	-
18 AFUDC	(18,618)	(18,239)
19 INTEREST INCOME	<u>(5,382)</u>	<u>(5,432)</u>
20 NET INTEREST EXPENSE	148,929	162,145
21 TOTAL EXPENSES	1,057,646	1,080,125
22 MINIMUM REQUIRED NET REVENUE 1/	21,756	22,443
23 PLANNED NET REVENUES FOR RISK	-	-
24 TOTAL PLANNED NET REVENUE	21,756	22,443
25 TOTAL REVENUE REQUIREMENT	1,079,401	1,102,567

1/ See note on cash flow table

Table 4: Transmission Revenue Requirement Statement of Cash Flows
(\$000s)

	A	B
	2020	2021
1 CASH FROM CURRENT OPERATIONS:		
2 MINIMUM REQUIRED NET REVENUE	21,756	22,443
3 DRAWDOWN OF CASH RESERVES FOR CAPITAL FUNDING	-	-
4 EXPENSES NOT REQUIRING CASH:		
5 DEPRECIATION & AMORTIZATION	345,584	352,560
6 TRANSMISSION CREDIT PROJECTS NET INTEREST	4,292	3,757
7 AMORTIZATION OF CAPITALIZED BOND PREMIUMS	559	559
8 CAPITALIZATION ADJUSTMENT	(18,968)	(18,968)
9 NON-CASH REVENUES/ACCRUAL REVENUES		
10 LGIA	(17,493)	(17,753)
11 AC INTERTIE CO/FIBER	(3,410)	(3,410)
12 CASH PROVIDED BY CURRENT OPERATIONS	<u>332,319</u>	<u>339,187</u>
13 CASH USED FOR CAPITAL INVESTMENTS:		
14 INVESTMENT IN:		
15 UTILITY PLANT	(461,128)	(466,452)
16 CASH USED FOR CAPITAL INVESTMENTS	(461,128)	(466,452)
17 CASH FROM TREASURY BORROWING AND APPROPRIATIONS:		
18 INCREASE IN LONG-TERM DEBT	438,128	443,452
19 DEBT SERVICE REASSIGNMENT PRINCIPAL	(19,592)	(20,571)
20 REPAYMENT OF CAPITAL LEASES	(79,361)	(79,543)
21 REPAYMENT OF LONG-TERM DEBT	(210,366)	(216,074)
22 REPAYMENT OF CAPITAL APPROPRIATIONS	-	-
23 CASH FROM TREASURY BORROWING AND APPROPRIATIONS	128,809	127,265
24 ANNUAL INCREASE (DECREASE) IN CASH ^{1/}	-	-
25 PLANNED NET REVENUE FOR RISK	-	-
26 TOTAL ANNUAL INCREASE (DECREASE) IN CASH	-	-

1/ Line 24 must be greater than or equal to zero, otherwise planned net revenues for risk will be added so that there are no negative cash flows for the year.

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

		A	B
		FY 2020	FY 2021
1	REVENUES FROM CURRENT RATES	1,052,020	1,077,380
2	OPERATING EXPENSES		
3	TRANSMISSION OPERATIONS	168,490	163,854
4	TRANSMISSION ENGINEERING	44,127	49,484
5	TRANSMISSION MAINTENANCE	173,074	173,283
6	TRANSMISSION ACQUISITION & ANCILLARY SERVICES	113,914	113,914
7	BPA INTERNAL SUPPORT	92,528	93,884
8	OTHER INCOME, EXPENSES & ADJUSTMENTS	(29,000)	(29,000)
9	DEPRECIATION & AMORTIZATION	345,584	352,560
10	TOTAL OPERATING EXPENSES	908,717	917,979
11	INTEREST EXPENSE		
12	INTEREST EXPENSE		
13	FEDERAL APPROPRIATIONS	-	-
14	CAPITALIZATION ADJUSTMENT	(18,968)	(18,968)
15	ON LONG-TERM DEBT	103,595	114,356
16	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	559	559
17	DEBT SERVICE REASSIGNMENT INTEREST	4,880	3,943
18	NON-FEDERAL INTEREST	82,864	85,927
17	PREMIUMS/DISCOUNTS	-	-
19	AFUDC	(18,618)	(18,239)
20	INTEREST INCOME	(5,431)	(5,267)
21	NET INTEREST EXPENSE	148,880	162,311
22	TOTAL EXPENSES	1,057,597	1,080,290
23	NET REVENUES	(5,578)	(2,910)

Table 6: Transmission Current Revenue Test Statement of Cash Flows
(\$000s)

		A	B
		FY 2020	FY 2021
1	CASH FROM CURRENT OPERATIONS:		
2	NET REVENUES	(5,578)	(2,910)
3	DRAWDOWN OF CASH RESERVES FOR CAPITAL FUNDING	-	-
4	EXPENSES NOT REQUIRING CASH:		
5	DEPRECIATION & AMORTIZATION	345,584	352,560
6	TRANSMISSION CREDIT PROJECTS NET INTEREST	4,292	3,757
7	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	559	559
8	CAPITALIZATION ADJUSTMENT	(18,968)	(18,968)
9	NON-CASH REVENUES/ACCRUAL REVENUES		
10	LGIA	(17,493)	(17,753)
11	AC INTERTIE CO/FIBER	(3,410)	(3,410)
12	CASH PROVIDED BY CURRENT OPERATIONS	304,986	313,835
13	CASH USED FOR CAPITAL INVESTMENTS:		
14	INVESTMENT IN:		
15	UTILITY PLANT	(461,128)	(466,452)
16	CASH USED FOR CAPITAL INVESTMENTS	(461,128)	(466,452)
17	CASH FROM TREASURY BORROWING AND APPROPRIATIONS:		
18	INCREASE IN LONG-TERM DEBT	438,128	443,452
19	DEBT SERVICE REASSIGNMENT PRINCIPAL	(19,592)	(20,571)
20	REPAYMENT OF CAPITAL LEASES	(79,361)	(79,543)
21	REPAYMENT OF LONG-TERM DEBT	(210,366)	(216,074)
22	REPAYMENT OF CAPITAL APPROPRIATIONS	-	-
23	CASH FROM TREASURY BORROWING AND APPROPRIATIONS	128,809	127,265
24	ANNUAL INCREASE (DECREASE) IN CASH	(27,333)	(25,352)

Table 7: Transmission Revenues from Current Rates – Results through the Repayment Period
(\$000s)

	A	B	C	D	E	F	G	H	I	J	K
		OPERATION & MAINTENANCE	DEBT SERVICE OFFSEIS		NET INTEREST	NET REVENUES	NONCASH EXPENSES 1/	FUNDS FROM OPERATION 2/	AMORTIZATION	NON-FEDERAL PRINCIPAL	NET POSITION
YEAR	REVENUES	(STATEMENT A)	(REV REQ STUDY DOC)	DEPRECIATION	(TABLE D)	(F=A-B-C-D-E)	(COLUMN D)	(H=F+G)	(REV REQ STUDY DOC, Chapter 10)	(REV REQ STUDY DOC, Chapter 7)	(K=H-I)
COMBINED CUMULATIVE	(STATEMENT A)	(STATEMENT B)	(REV REQ STUDY DOC)	DEPRECIATION	(TABLE D)	(F=A-B-C-D-E)	(COLUMN D)	(H=F+G)	(REV REQ STUDY DOC, Chapter 10)	(REV REQ STUDY DOC, Chapter 7)	(K=H-I)
1977	3,298,951	963,839	348,748	807,047	1,220,170	(40,853)	807,047	766,194	628,460		137,734
1978-2018	24,906,150	11,840,892	0	5,703,900	5,835,356	1,526,002	5,228,570	7,903,858	6,335,098	1,168,397	400,362
COST EVALUATION PERIOD											
2019	1,047,723	602,901	0	284,422	164,168	(3,767)	256,172	252,404	235,016	17,304	85
RATE APPROVAL PERIOD											
2020	1,052,020	563,133	0	345,584	148,880	(5,578)	310,563	281,986	210,366	98,953	(27,333)
2021	1,077,380	565,419	0	352,560	162,311	(2,910)	316,745	290,835	216,074	100,113	(25,352)
REPAYMENT PERIOD											
2022	1,077,380	565,419	(6,905)	352,560	191,758	(25,452)	312,988	287,535	198,882	94,986	(6,332)
2023	1,077,380	565,419	(6,905)	352,560	193,103	(26,797)	312,988	286,190	197,619	95,235	(6,663)
2024	1,077,380	565,419	(6,905)	352,560	186,764	(20,458)	312,988	292,530	182,156	117,038	(6,664)
2025	1,077,380	565,419	(6,905)	352,560	184,203	(17,897)	312,988	295,091	201,431	100,324	(6,663)
2026	1,077,380	565,419	(6,905)	352,560	180,687	(14,381)	312,988	298,607	208,153	97,116	(6,662)
2027	1,077,380	565,419	(6,905)	352,560	178,752	(12,446)	312,988	300,541	207,826	99,379	(6,664)
2028	1,077,380	565,419	(6,905)	352,560	177,372	(11,066)	312,988	301,921	208,149	100,435	(6,663)
2029	1,077,380	565,419	(6,905)	352,560	171,684	(5,378)	312,988	307,610	195,321	118,952	(6,663)
2030	1,077,380	565,419	(6,905)	352,560	163,377	2,929	312,988	315,916	203,215	119,364	(6,663)
2031	1,077,380	565,419	(6,905)	352,560	160,594	5,712	312,988	318,699	206,536	118,827	(6,663)
2032	1,077,380	565,419	(6,905)	352,560	152,536	13,770	312,988	326,758	206,287	127,133	(6,662)
2033	1,077,380	565,419	(6,905)	352,560	147,309	18,997	312,988	331,984	211,070	127,577	(6,663)
2034	1,077,380	565,419	(6,905)	352,560	135,460	30,846	312,988	343,834	247,493	103,003	(6,662)
2035	1,077,380	565,419	(6,905)	352,560	133,307	32,999	312,988	345,986	226,190	126,459	(6,663)
2036	1,077,380	565,419	(6,905)	352,560	119,558	46,748	312,988	359,736	226,548	126,548	(6,663)
2037	1,077,380	565,419	(6,905)	352,560	114,920	51,386	312,988	364,373	269,394	101,642	(6,663)
2038	1,077,380	565,419	(6,905)	352,560	118,009	48,297	312,988	361,284	277,991	89,956	(6,663)
2039	1,077,380	565,419	(6,905)	352,560	119,445	46,861	312,988	359,849	271,841	94,672	(6,664)
2040	1,077,380	565,419	(6,905)	352,560	115,302	51,004	312,988	363,991	277,096	93,559	(6,663)
2041	1,077,380	565,419	(6,905)	352,560	103,954	62,352	312,988	375,340	379,919	2,083	(6,663)
2042	1,077,380	565,419	(6,905)	352,560	94,968	71,338	312,988	384,326	304,037	86,952	(6,662)
2043	1,077,380	565,419	(6,905)	352,560	81,443	84,863	312,988	397,850	402,458	2,055	(6,663)
2044	1,077,380	565,419	(6,905)	352,560	68,635	97,671	312,988	410,658	417,009	313	(6,663)
2045	1,077,380	565,419	(6,905)	352,560	55,495	110,811	312,988	423,799	430,461	0	(6,662)
2046	1,077,380	565,419	(6,905)	352,560	41,706	124,600	312,988	437,588	444,251	0	(6,663)
2047	1,077,380	565,419	(6,905)	352,560	27,197	139,109	312,988	452,097	458,760	0	(6,663)
2048	1,077,380	565,419	(6,905)	352,560	11,932	154,374	312,988	467,362	474,025	0	(6,663)
2049	1,077,380	565,419	(6,905)	352,560	(4,129)	170,435	312,988	483,423	490,085	0	(6,662)
2050	1,077,380	565,419	(6,905)	352,560	(21,027)	187,333	312,988	500,321	506,983	0	(6,662)
2051	1,077,380	565,419	(6,905)	352,560	(32,270)	198,576	312,988	511,564	266,982	0	244,582
2052	1,077,380	565,419	(6,905)	352,560	(34,842)	201,148	312,988	514,136	165,909	0	348,227
2053	1,077,380	565,419	(6,905)	352,560	(34,842)	201,148	312,988	514,136	165,909	0	348,227
2054	1,077,380	565,419	(6,905)	352,560	(34,842)	201,148	312,988	514,136	165,909	0	348,227
2055	1,077,380	565,419	(6,905)	352,560	(34,842)	201,148	312,988	514,136	165,909	0	348,227
2056	1,077,380	565,419	(6,905)	352,560	(34,842)	201,148	312,988	514,136	165,909	0	348,227
TRANSMISSION TOTALS	69,090,532	34,325,865	107,068	19,833,108	10,728,720	4,095,772	17,873,664	23,072,720	17,266,029	3,528,373	2,278,319

1/CONSISTS OF DEPRECIATION PLUS ANY ACCOUNTING WRITE-OFFS INCLUDED IN EXPENSES.
2/INCLUDES ADJUSTMENTS FOR NON-CASH REVENUES OR OTHER ACCRUAL TO CASH ADJUSTMENTS.

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

		A	B
		FY 2020	FY 2021
1	REVENUES FROM PROPOSED RATES	1,074,674	1,107,214
2	OPERATING EXPENSES		
3	TRANSMISSION OPERATIONS	168,490	163,854
4	TRANSMISSION ENGINEERING	44,127	49,484
5	TRANSMISSION MAINTENANCE	173,074	173,283
6	TRANSMISSION ACQUISITION & ANCILLARY SERVICES	113,914	113,914
7	BPA INTERNAL SUPPORT	92,528	93,884
8	OTHER INCOME, EXPENSES & ADJUSTMENTS	(29,000)	(29,000)
9	DEPRECIATION & AMORTIZATION	345,584	352,560
10	TOTAL OPERATING EXPENSES	908,717	917,979
11	INTEREST EXPENSE		
12	INTEREST EXPENSE		
13	FEDERAL APPROPRIATIONS	-	-
14	CAPITALIZATION ADJUSTMENT	(18,968)	(18,968)
15	ON LONG-TERM DEBT	103,593	114,388
16	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	559	559
17	DEBT SERVICE REASSIGNMENT INTEREST	4,880	3,943
18	NON-FEDERAL INTEREST	82,864	85,927
19	PREMIUMS/DISCOUNTS	50	68
19	AFUDC	(18,618)	(18,239)
20	INTEREST INCOME	(5,564)	(5,599)
21	NET INTEREST EXPENSE	148,795	162,078
22	TOTAL EXPENSES	1,057,512	1,080,057
23	NET REVENUES	17,162	27,156

Table 9: Transmission Revised Revenue Test Statement of Cash Flows
(\$000s)

		A	B
		FY 2020	FY 2021
1	CASH FROM CURRENT OPERATIONS:		
2	NET REVENUES	17,162	27,156
3	DRAWDOWN OF CASH RESERVES FOR CAPITAL FUNDING	-	-
4	EXPENSES NOT REQUIRING CASH:		
5	DEPRECIATION & AMORTIZATION	345,584	352,560
6	TRANSMISSION CREDIT PROJECTS NET INTEREST	4,292	3,757
7	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	559	559
8	CAPITALIZATION ADJUSTMENT	(18,968)	(18,968)
9	NON-CASH REVENUES/ACCRUAL REVENUES		
10	LGIA	(17,493)	(17,753)
11	AC INTERTIE CO/FIBER	(3,410)	(3,410)
12	CASH FLOW ADJUSTMENT (RESERVE)/APPLICATION	-	-
13	CASH PROVIDED BY CURRENT OPERATIONS	327,725	343,901
14	CASH USED FOR CAPITAL INVESTMENTS:		
15	INVESTMENT IN:		
16	UTILITY PLANT	(461,128)	(466,452)
17	CASH USED FOR CAPITAL INVESTMENTS	(461,128)	(466,452)
18	CASH FROM TREASURY BORROWING AND APPROPRIATIONS:		
19	INCREASE IN LONG-TERM DEBT	438,128	443,452
20	DEBT SERVICE REASSIGNMENT PRINCIPAL	(19,592)	(20,571)
21	REPAYMENT OF CAPITAL LEASES	(79,361)	(79,543)
22	REPAYMENT OF LONG-TERM DEBT	(205,766)	(220,674)
23	REPAYMENT OF CAPITAL APPROPRIATIONS	-	-
24	CASH FROM TREASURY BORROWING AND APPROPRIATIONS	133,409	122,665
25	ANNUAL INCREASE (DECREASE) IN CASH	6	114

Table 10: Transmission Revenues from Proposed Rates through the Repayment Period
(\$000s)

	A	B	C	D	E	F	G	H	I	J	K
			DEBT SERVICE OFFSEES			NET INTEREST		FUNDS FROM OPERATION 2/		NON-FEDERAL PRINCIPAL	
YEAR	REVENUES (STATEMENT A)	OPERATION & MAINTENANCE (STATEMENT E)	(REV REQ STUDY DOC)	DEPRECIATION	(TABLED)	NET REVENUES (F=A-B-C-D-E)	NONCASH EXPENSES 1/ (COLUMN D)	(H=F+G)	AMORTIZATION (REV REQ STUDY DOC,Chapter 11)	(REV REQ STUDY DOC,Chapter 7)	NET POSITION (K=H-I-J)
COMBINED CUMULATIVE											
1977	3,298,951	963,839	348,748	807,047	1,220,170	(40,853)	807,047	766,194	628,460		137,734
1978-2018	22,724,227	10,659,129	0	5,156,689	5,555,070	1,353,341	4,708,973	7,270,129	6,190,753	773,227	306,148
COST EVALUATION PERIOD											
2019	1,047,723	602,901	0	284,422	164,168	(3,767)	256,172	252,404	235,016	17,304	85
RATE APPROVAL PERIOD											
2020	1,074,674	563,133	0	345,584	148,795	17,162	310,563	304,725	205,766	98,953	6
2021	1,107,214	565,419	0	352,560	162,078	27,156	316,745	320,901	220,674	100,113	114
REPAYMENT PERIOD											
2022	1,107,214	565,419	(6,905)	352,560	192,086	4,054	312,988	317,041	198,882	94,986	23,174
2023	1,107,214	565,419	(6,905)	352,560	193,101	3,039	312,988	316,026	197,619	95,235	23,173
2024	1,107,214	565,419	(6,905)	352,560	186,761	9,378	312,988	322,366	182,156	117,038	23,172
2025	1,107,214	565,419	(6,905)	352,560	184,200	11,940	312,988	324,927	201,431	100,324	23,173
2026	1,107,214	565,419	(6,905)	352,560	180,684	15,455	312,988	328,443	208,153	97,116	23,174
2027	1,107,214	565,419	(6,905)	352,560	178,750	17,390	312,988	330,378	207,826	99,379	23,173
2028	1,107,214	565,419	(6,905)	352,560	177,370	18,770	312,988	331,757	208,149	100,435	23,173
2029	1,107,214	565,419	(6,905)	352,560	171,681	24,458	312,988	337,446	195,321	118,952	23,173
2030	1,107,214	565,419	(6,905)	352,560	163,375	32,765	312,988	345,752	203,215	119,364	23,173
2031	1,107,214	565,419	(6,905)	352,560	160,592	35,548	312,988	348,535	206,536	118,827	23,173
2032	1,107,214	565,419	(6,905)	352,560	152,533	43,606	312,988	356,594	206,287	127,133	23,174
2033	1,107,214	565,419	(6,905)	352,560	147,307	48,833	312,988	361,820	211,070	127,577	23,173
2034	1,107,214	565,419	(6,905)	352,560	135,457	60,682	312,988	373,670	247,493	103,003	23,175
2035	1,107,214	565,419	(6,905)	352,560	133,305	62,835	312,988	375,822	226,190	126,459	23,173
2036	1,107,214	565,419	(6,905)	352,560	119,555	76,584	312,988	389,572	239,851	126,548	23,173
2037	1,107,214	565,419	(6,905)	352,560	114,918	81,222	312,988	394,209	269,394	101,642	23,173
2038	1,107,214	565,419	(6,905)	352,560	118,007	78,133	312,988	391,120	277,991	89,956	23,173
2039	1,107,214	565,419	(6,905)	352,560	119,442	76,697	312,988	389,685	271,841	94,672	23,172
2040	1,107,214	565,419	(6,905)	352,560	115,300	80,840	312,988	393,828	277,096	93,559	23,173
2041	1,107,214	565,419	(6,905)	352,560	103,951	92,188	312,988	405,176	379,919	2,083	23,173
2042	1,107,214	565,419	(6,905)	352,560	94,965	101,174	312,988	414,162	304,037	86,952	23,174
2043	1,107,214	565,419	(6,905)	352,560	81,441	114,699	312,988	427,686	402,458	2,055	23,173
2044	1,107,214	565,419	(6,905)	352,560	68,633	127,507	312,988	440,495	417,009	313	23,173
2045	1,107,214	565,419	(6,905)	352,560	55,492	140,647	312,988	453,635	430,461	-	23,174
2046	1,107,214	565,419	(6,905)	352,560	41,703	154,436	312,988	467,424	444,251	-	23,173
2047	1,107,214	565,419	(6,905)	352,560	27,194	168,945	312,988	481,933	458,760	-	23,173
2048	1,107,214	565,419	(6,905)	352,560	11,929	184,210	312,988	497,198	474,025	-	23,173
2049	1,107,214	565,419	(6,905)	352,560	(4,132)	200,271	312,988	513,259	490,085	-	23,174
2050	1,107,214	565,419	(6,905)	352,560	(21,030)	217,169	312,988	530,157	506,983	-	23,174
2051	1,107,214	565,419	(6,905)	352,560	(32,273)	228,412	312,988	541,400	266,982	-	274,418
2052	1,107,214	565,419	(6,905)	352,560	(34,845)	230,984	312,988	543,972	165,909	-	378,063
2053	1,107,214	565,419	(6,905)	352,560	(34,845)	230,984	312,988	543,972	165,909	-	378,063
2054	1,107,214	565,419	(6,905)	352,560	(34,845)	230,984	312,988	543,972	165,909	-	378,063
2055	1,107,214	565,419	(6,905)	352,560	(34,845)	230,984	312,988	543,972	165,909	-	378,063
2056	1,107,214	565,419	(6,905)	352,560	(34,845)	230,984	312,988	543,972	165,909	-	378,063
TRANSMISSION TOTALS	68,005,267	33,144,101	107,068	19,285,897	10,448,353	5,019,848	17,354,066	23,535,729	17,121,683	3,133,203	3,280,843

1/CONSISTS OF DEPRECIATION PLUS ANY ACCOUNTING WRITE-OFFS INCLUDED IN EXPENSES.
2/INCLUDES ADJUSTMENTS FOR NON-CASH REVENUES OR OTHER ACCRUAL TO CASH ADJUSTMENTS.

Table 11: Amortization of Transmission Investments Over Repayment Period
(\$000s)

A	B	C	INVESTMENTS PLACED IN SERVICE				G	H
			Original & New Obligations	Replacements	Cumulative Amount In Service	Due Amortization		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
1	2018	12,830,308	-	12,830,308	-	6,956	3,126,667	6,431,128
2	2019	375,350	-	13,205,658	210,750	24,266	3,267,001	6,316,336
3	2020	424,700	-	13,630,358	205,366	400	3,485,935	6,452,828
4	2021	741,800	-	14,372,158	220,074	600	4,007,061	6,916,317
5	2022	-	165,909	14,538,067	140,200	58,682	3,974,089	6,889,015
6	2023	-	165,909	14,703,976	100,000	97,619	3,942,379	6,954,924
7	2024	-	165,909	14,869,885	113,800	68,356	3,926,132	7,007,033
8	2025	-	165,909	15,035,794	120,350	81,081	3,890,611	6,937,659
9	2026	-	165,909	15,201,703	142,700	65,453	3,848,367	6,960,868
10	2027	-	165,909	15,367,613	119,800	88,026	3,806,450	7,006,978
11	2028	-	165,909	15,533,522	136,940	71,209	3,764,210	6,874,087
12	2029	-	165,909	15,699,431	62,000	133,321	3,734,798	6,962,274
13	2030	-	165,909	15,865,340	73,000	130,215	3,697,492	6,920,905
14	2031	-	165,909	16,031,249	63,000	143,536	3,656,865	6,723,814
15	2032	-	165,909	16,197,158	107,900	98,387	3,616,487	6,232,923
16	2033	-	165,909	16,363,067	68,000	143,070	3,571,325	5,660,870
17	2034	-	165,909	16,528,976	180,000	67,493	3,489,742	5,288,379
18	2035	-	165,909	16,694,885	79,434	146,757	3,429,461	5,150,288
19	2036	-	165,909	16,860,794	108,000	131,851	3,355,519	5,039,197
20	2037	-	165,909	17,026,703	30,000	239,394	3,252,034	5,105,106
21	2038	-	165,909	17,192,613	-	277,991	3,139,953	5,209,016
22	2039	-	165,909	17,358,522	-	271,841	3,034,020	5,210,925
23	2040	-	165,909	17,524,431	-	277,096	2,922,834	5,196,834
24	2041	-	165,909	17,690,340	-	379,919	2,708,824	5,261,743
25	2042	-	165,909	17,856,249	-	304,037	2,570,696	5,388,652
26	2043	-	165,909	18,022,158	-	402,458	2,334,147	5,169,561
27	2044	-	165,909	18,188,067	-	417,009	2,083,047	5,191,470
28	2045	-	165,909	18,353,976	-	430,461	1,818,495	5,213,379
29	2046	-	165,909	18,519,885	-	444,251	1,540,154	5,268,754
30	2047	-	165,909	18,685,794	-	458,760	1,247,303	5,272,663
31	2048	-	165,909	18,851,703	-	474,025	939,188	5,300,572
32	2049	-	165,909	19,017,613	-	490,085	615,011	5,391,556
33	2050	-	165,909	19,183,522	-	506,983	273,938	5,384,465
34	2051	-	165,909	19,349,431	-	266,982	172,865	5,204,374
35	2052	-	165,909	19,515,340	-	165,909	172,865	5,370,283
36	2053	-	165,909	19,681,249	-	165,909	172,865	5,536,192
37	2054	-	165,909	19,847,158	-	165,909	172,865	5,702,101
38	2055	-	165,909	20,013,067	-	165,909	172,865	5,868,010
39	2056	-	165,909	20,178,976	-	165,909	172,865	6,033,919
40		\$14,372,158	\$5,806,818		\$2,281,314	\$8,028,112		

