

BP-16 Initial Rate Proposal

Transmission Revenue Requirement Study
Documentation

BP-16-E-BPA-08A

December 2014



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COMMONLY USED ACRONYMS AND SHORT FORMS

AAC	Anticipated Accumulation of Cash
ACNR	Accumulated Calibrated Net Revenue
AER step	Actual Energy Regulation study
AGC	Automatic Generation Control
ALF	Agency Load Forecast (computer model)
aMW	average megawatt(s)
AMNR	Accumulated Modified Net Revenues
ANR	Accumulated Net Revenues
AOP	Assured Operating Plan
ASC	Average System Cost
BAA	Balancing Authority Area
BiOp	Biological Opinion
BPA	Bonneville Power Administration
BPA-P	Bonneville Power Administration – Power
BPA-T	Bonneville Power Administration – Transmission
Btu	British thermal unit
CDD	cooling degree day(s)
CDQ	Contract Demand Quantity
CGS	Columbia Generating Station
CHWM	Contract High Water Mark
CNR	Calibrated Net Revenue
COE, Corps, or USACE Commission	U.S. Army Corps of Engineers Federal Energy Regulatory Commission
Corps, COE, or USACE	U.S. Army Corps of Engineers
COSA	Cost of Service Analysis
COU	consumer-owned utility
Council or NPCC	Northwest Power and Conservation Council
CP	Coincidental Peak
CRAC	Cost Recovery Adjustment Clause
CSP	Customer System Peak
CT	combustion turbine
CY	calendar year (January through December)
DDC	Dividend Distribution Clause
<i>dec</i>	decrease, decrement, or decremental
DERBS	Dispatchable Energy Resource Balancing Service
DFS	Diurnal Flattening Service
DOE	Department of Energy
DOP	Detailed Operating Plan
DSI	direct-service industrial customer or direct-service industry
DSO	Dispatcher Standing Order
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EN	Energy Northwest, Inc.
EPP	Environmentally Preferred Power

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
FHFO	Funds Held for Others
FORS	Forced Outage Reserve Service
FPS	Firm Power and Surplus Products and Services (rate)
FY	fiscal year (October through September)
G&A	general & administrative
GARD	Generation and Reserves Dispatch (computer model)
GEP	Green Energy Premium
GMS	Generation Management Service
GRSPs	General Rate Schedule Provisions
GTA	General Transfer Agreement
GWh	gigawatthour
HDD	heating degree day(s)
HLH	Heavy Load Hour(s)
HOSS	Hourly Operating and Scheduling Simulator (computer model)
HYDSIM	Hydrosystem Simulator (computer model)
ICE	Intercontinental Exchange
<i>inc</i>	increase, increment, or incremental
IOU	investor-owned utility
IP	Industrial Firm Power (rate)
IPR	Integrated Program Review
IRD	Irrigation Rate Discount
IRM	Irrigation Rate Mitigation
IRMP	Irrigation Rate Mitigation Product
JOE	Joint Operating Entity
kcfs	thousand cubic feet per second
kW	kilowatt (1000 watts)
kWh	kilowatthour
LPP	Large Project Program
LDD	Low Density Discount
LLH	Light Load Hour(s)
LPTAC	Large Project Targeted Adjustment Charge
LRA	Load Reduction Agreement
Maf	million acre-feet
Mid-C	Mid-Columbia
MMBtu	million British thermal units
MNR	Modified Net Revenues
MRNR	Minimum Required Net Revenue
MW	megawatt (1 million watts)
MWh	megawatthour

NCP	Non-Coincidental Peak
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NFB	National Marine Fisheries Service (NMFS) Federal Columbia River Power System (FCRPS) Biological Opinion (BiOp)
NLSL	New Large Single Load
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Oceanographic and Atmospheric Administration Fisheries
NORM	Non-Operating Risk Model (computer model)
Northwest Power Act	Pacific Northwest Electric Power Planning and Conservation Act
NPCC or Council	Pacific Northwest Electric Power and Conservation Planning Council
NPV	net present value
NR	New Resource Firm Power (rate)
NRFS	New Resource Flattening Service
NT	Network Transmission
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.
OMB	Office of Management and Budget
OPER step	operational study
OY	operating year (August through July)
PF	Priority Firm Power (rate)
PFp	Priority Firm Public (rate)
PFx	Priority Firm Exchange (rate)
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
POM	Point of Metering
POR	Point of Receipt
Project Act	Bonneville Project Act
PRS	Power Rates Study
PS	BPA Power Services
PSW	Pacific Southwest
PTP	Point to Point Transmission (rate)
PUD	public or people's utility district
RAM	Rate Analysis Model (computer model)
RAS	Remedial Action Scheme
RD	Regional Dialogue
REC	Renewable Energy Certificate
Reclamation or USBR	U.S. Bureau of Reclamation

REP	Residential Exchange Program
RevSim	Revenue Simulation Model (component of RiskMod)
RFA	Revenue Forecast Application (database)
RHWM	Rate Period High Water Mark
RiskMod	Risk Analysis Model (computer model)
RiskSim	Risk Simulation Model (component of RiskMod)
ROD	Record of Decision
RPSA	Residential Purchase and Sale Agreement
RR	Resource Replacement (rate)
RRS	Resource Remarketing Service
RSS	Resource Support Services
RT1SC	RHWM Tier 1 System Capability
RTO	Regional Transmission Operator
SCADA	Supervisory Control and Data Acquisition
SCS	Secondary Crediting Service
Slice	Slice of the System (product)
T1SFCO	Tier 1 System Firm Critical Output
TCMS	Transmission Curtailment Management Service
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	BPA Transmission Services
TSS	Transmission Scheduling Service
UAI	Unauthorized Increase
ULS	Unanticipated Load Service
USACE, Corps, or COE	U.S. Army Corps of Engineers
USBR or Reclamation	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
VERBS	Variable Energy Resources Balancing Service (rate)
VOR	Value of Reserves
VR1-2014	First Vintage rate of the BP-14 rate period
WECC	Western Electricity Coordinating Council (formerly WSCC)
WIT	Wind Integration Team
WSPP	Western Systems Power Pool

1. TRANSMISSION REVENUE REQUIREMENTS

1.1 Introduction

Chapter 1 documents how the Bonneville Power Administration's (BPA) annual transmission revenue requirements are determined. Two tables are presented, each showing both years of the rate period (FY 2016 and FY 2017). On the first table, revenue requirements for FY 2016 and FY 2017 are projected in an income statement format. The second table, a statement of annual cash flows, determines the minimum required net revenues and presents the annual cash flows available for risk mitigation.

1.2 Income Statement

Below is a line-by-line description of each of the components in the Income Statement (table 1-1).

Transmission operations (line 2). Transmission operations includes spending for technical operations; substation operations; control center support; power system dispatching; Transmission information technology (IT) costs, including corporate agency services IT costs that are allocated to Transmission Services (TS); and scheduling services (reservations, pre-scheduling, real-time and after-the-fact scheduling, and technical support). This category also includes spending for business strategy and assessment, billing, finance, contract management, and internal operations. *See* ch. 3.

Transmission engineering (line 3). This category includes spending on asset management and planning, design of lines/towers/substations, construction planning, construction management, and real property services. *Id.*

Transmission maintenance (line 4). This category includes spending for all Transmission Services maintenance activities, such as ongoing maintenance of substations, lines, and protection control systems. This category also includes spending on environmental analysis and pollution prevention and abatement. *Id.*

Transmission acquisition & ancillary services (line 5). This category includes inter-business line expenses resulting from functional separation and costs of ancillary services products, including Power Services generation inputs to ancillary services. It also includes the costs of station service and remedial action schemes, Corps of Engineers (Corps) and Bureau of Reclamation (Reclamation) transmission facilities serving the Network and Utility Delivery segments, and payments to other utilities for stability reserves, settlements, and operating leases. *Id.*

BPA internal support (line 6). This category comprises spending on general and administrative programs that are allocated to BPA's two business units. These programs include legal services, finance, risk management, security and emergency management, human resources, and executive oversight and management. *Id.*

Other income, expenses & adjustments (line 7). Generally, this category includes items that do not fit in any other category.

Depreciation & amortization (line 8). Depreciation is the annual capital recovery expense associated with Federal Columbia River Transmission System (FCRTS) plant-in-service. BPA transmission and general plant are depreciated by the straight-line method, using the remaining life technique. Amortization refers to the annual capital recovery expense for deferred transmission assets. *See* chs. 3 & 4.

Total operating expenses (line 9). Total operating expenses is the sum of the above expenses (lines 2 through 8).

Federal appropriations (line 12). Federal appropriations consists of interest on the appropriations BPA received prior to full implementation of BPA's self-financing authority and is determined in the transmission repayment studies. *See* ch. 3.

Capitalization adjustment (line 13). Implementation of the BPA Appropriations Refinancing Act (*see* Transmission Revenue Requirement Study, BP-16-E-BPA-08, § 1.2.1.2) entailed a change in capitalization on BPA's financial statements. Outstanding appropriations attributed to the transmission function were reduced by \$470 million as a result of the refinancing. The reduction is recognized annually over the remaining repayment period of the refinanced appropriations. The annual recognition of this adjustment is based on the increase in annual interest expense resulting from implementation of the Act, as shown in repayment studies for the year of the refinancing transaction (1997). The capitalization adjustment is included on the income statement as a non-cash expense. *See* ch. 3 .

Long-term debt (line 14). Long-term debt includes interest on bonds that BPA issues to the U.S. Treasury to fund investments in transmission plant, environment, general plant supportive of transmission, and capital equipment. Such interest expense is determined in the transmission repayment studies. This line includes any payments of call premiums for bonds projected to be amortized. *Id.*

Amortization of capitalized bond premiums (line 15). When a bond issued to the U.S. Treasury is refinanced, any call premium resulting from early retirement of the original bond is capitalized and included in the principal of the new bond. The capitalized call premium then is amortized over the term of the new bond. The annual amortization is a non-cash component of interest expense. *Id.*

Debt service reassignment interest (line 16). Debt service reassignment interest consists of the interest component of the debt service reassigned to TS through the Debt Optimization Program. *Id.* and ch. 8.

Non-Federal interest (line 17). Non-Federal interest consists of interest paid on BPA's lease-financing projects and other capital leases as well as interest paid on customer advance funding for generator interconnection agreements and for the California-Oregon Intertie (COI) upgrade. The customers' advanced funds accrue interest on the outstanding balances until they are returned to customers through credits for transmission service. *See* Transmission Revenue Requirement Study, BP-16-E-BPA-08, § 2.3.5.

Allowance for funds used during construction (AFUDC) (line 18). AFUDC for U.S. Treasury-financed transmission projects is a credit against interest on long-term debt (line 14). This non-cash reduction to interest expense reflects an estimate of interest on the funds used during the construction period of facilities that are not yet in service. Also included is the interest accrued on LGIA funds during the construction period of the associated facilities. AFUDC is capitalized along with other construction costs and is recovered through rates over the expected service life of the related plant as part of the depreciation expense after the facilities are placed in service. *See ch. 3.*

Interest income (line 19). Interest income is computed on the projected year-end cash balances in the BPA Fund that are attributed to the transmission function and that carry over into the next year. It is credited against interest on long-term debt. Also included is an interest income credit calculated in the transmission repayment studies on funds to be collected during each year for payments of Federal interest and amortization at the end of the fiscal year. *See ch. 5.*

Net interest expense (line 20). Net interest expense is computed as the sum of the interest on Federal appropriations (line 12), capitalization adjustment (line 13), long-term debt (line 14), amortization of capitalized bond premiums (line 15), debt service reassignment interest (line 16), non-Federal interest (line 17), AFUDC (line 18), and interest income (line 19).

Total expenses (line 21). Total expenses is the sum of total operating expenses (line 9) and net interest expense (line 20).

Minimum Required Net Revenues (line 22). Minimum required net revenues (MRNR), an input from line 2 of the Statement of Cash Flows (table 1-2), may be necessary to cover cash requirements in excess of accrued expenses. An explanation of the method used for determining MRNR is included in chapter 1.3 below.

Planned Net Revenues for Risk (line 23). Planned net revenues for risk (PNRR) is the amount of net revenues, if any, to be included in rates for financial risk mitigation. There are no Planned Net Revenues for Risk included in the Initial Rate Proposal. Starting Transmission reserves in FY 2016 are projected to be sufficient to mitigate risk in FY 2016 and 2017. *See Transmission Revenue Requirement Study, BP-16-E-BPA-08, § 2.2.*

Total planned net revenues (line 24). Total planned net revenues is the sum of Minimum Required Net Revenues (line 22) and Planned Net Revenues for Risk (line 23).

Total revenue requirement (line 25). Total revenue requirement is the sum of total expenses (line 21) and total planned net revenues (line 24).

1.3 Statement of Cash Flows

Below is a line-by-line description of each of the components in the Statement of Cash Flows (table 1-2).

Minimum Required Net Revenue (MRNR) (line 2). BPA determines whether MRNR is necessary by evaluating the annual cash inflows and outflows shown on the Statement of Cash Flows. MRNR may be necessary to ensure that the cash provided by current operations (line 12) will be sufficient to cover the planned amortization payments (the difference between lines 16 and 23) without causing the annual increase (decrease) in cash (line 25) to be negative. The MRNR determined in the Statement of Cash Flows is incorporated in the Income Statement (table 1-1, line 21).

Drawdown of cash reserves for capital funding (line 3). The drawdown of cash reserves for capital funding refers to the use of cash accumulated from transmission revenues in prior rate periods to fund a portion of capital expenditures in each year of the rate period rather than borrowing from the U.S. Treasury. It is included on this statement to avoid having the amount of this reserve financing included in the calculation of MRNR.

Depreciation & amortization (line 5). The depreciation amount is from the Income Statement (table 1-1, line 8). It, like the following five lines, is added back to net revenues in computing cash provided by current operations (table 1-2, line 10) because it is a non-cash expense.

Transmission credit projects net interest (line 6). Transmission credit projects net interest is the non-cash expenses from the Income Statement for generator interconnection and COI upgrade customers' interest on their credit balances for advance funding (included in table 1-1, line 17) and the AFUDC on the projects under construction funded by those customers (included in table 1-1, line 18).

Amortization of capitalized bond premiums (line 7). Amortization of capitalized bond premiums, from the Income Statement (table 1-1, line 15), is a non-cash expense.

Capitalization adjustment (line 8). The capitalization adjustment, from the Income Statement (table 1-1, line 13), is a negative non-cash expense.

LGIA (line 10). Revenue credits associated with customer-funded capital projects are recognized as non-cash revenues. Customers provide an up-front deposit for construction of transmission facilities which is returned to them through a transmission credit on their transmission service bill until the deposit is repaid.

AC Intertie/fiber (line 11). Accrual revenues are recognized here because these revenues provide no cash for cost recovery. BPA accounts for the AC Intertie non-Federal capacity ownership lump-sum payments received in FY 1995 as unearned revenues that are recognized annually over the estimated average service life of the associated transmission facilities. Similarly, some leases of fiber optic capacity have included up-front payments, which are being recognized over the life of the particular contract. The annual accrual revenues, which are part of the total revenues recovering the FCRTS revenue requirement, are included here as a non-cash adjustment to cash from current operations.

Cash provided by current operations (line 12). Cash provided by current operations, the sum of lines 2, 3, 5, 6, 7, 8, 10, and 11, is available for the year to satisfy cash requirements.

Investment in utility plant (line 15). Investment in utility plant represents the annual increase in capital expenditures for additions and replacements to the transmission system funded by U.S. Treasury bonds or available cash reserves. *See* ch. 3.

Cash used for capital investments (line 16). Cash used for capital investments is the sum of investments in utility plant.

Increase in long-term debt (line 18). Increase in long-term debt reflects the new bonds issued by BPA to the U.S. Treasury to fund the construction and environmental capital equipment programs. This amount also includes any notes issued to the U.S. Treasury. *See* ch. 7.

Debt service reassignment principal (line 19). Debt service reassignment principal is the principal component of the debt service obligation reassigned to TS through the Debt Optimization Program. *See* ch. 8.

Repayment of capital leases (line 20). Repayment of capital leases is BPA's payment of the principal component of certain capital leases.

Repayment of long-term debt (line 21). Repayment of long-term debt is BPA's planned repayment of outstanding bonds issued by BPA to the U.S. Treasury, as determined in the repayment studies. *See* ch. 3.

Repayment of capital appropriations (line 22). Repayment of capital appropriations represents projected amortization of outstanding BPA appropriations (pre-self-financing) as determined in the repayment studies. *Id.*

Cash from treasury borrowing and appropriations (line 23). Cash from treasury borrowing and appropriations is the sum of lines 18 through 22. This is the net cash flow resulting from increases in cash from new long-term debt and decreases in cash from repayment of long-term debt and capital appropriations.

Annual increase (decrease) in cash (line 24). Annual increase (decrease) in cash, the sum of lines 12, 16, and 23, reflects the annual net cash flow from current operations, investing, and financing activities. Revenue requirements are set to meet all projected annual cash flow requirements, as included on the Statement of Cash Flows. A decrease shown in this line would indicate that annual revenues are insufficient to cover the year's cash requirements. In such cases, Minimum Required Net Revenues are included to offset such decrease. *See* above discussion of Minimum Required Net Revenues (line 2).

Planned net revenues for risk (line 25). Planned net revenues for risk reflects the amounts included in revenue requirements to meet BPA's risk mitigation objectives (from table 1-1, line 24.)

Total annual increase (decrease) in cash (line 26). Total annual increase (decrease) in cash, the sum of Lines 24 and 25, is the total annual cash that is projected to be available to add to BPA's cash reserves.

	A	B	C	D	E	F	G
	TABLE 1-1						
	TRANSMISSION REVENUE REQUIREMENT INCOME STATEMENT						
1	(\$000)						
2						A	B
3						FY 2016	FY 2017
4							
5							
6	1				OPERATING EXPENSES		
7	2				TRANSMISSION OPERATIONS	155,274	160,800
8	3				TRANSMISSION ENGINEERING	54,421	54,915
9	4				TRANSMISSION MAINTENANCE	162,552	164,272
10	5				TRANSMISSION ACQUISITION & ANCILLARY SERVICES	140,767	140,782
11	6				BPA INTERNAL SUPPORT	85,106	86,915
12	7				OTHER INCOME, EXPENSES & ADJUSTMENTS	(2,100)	(2,100)
13	8				DEPRECIATION & AMORTIZATION	239,852	259,210
14	9				TOTAL OPERATING EXPENSES	835,872	864,796
15							
16	10				INTEREST EXPENSE		
17	11				INTEREST EXPENSE		
18	12				FEDERAL APPROPRIATIONS	14,418	8,351
19	13				CAPITALIZATION ADJUSTMENT	(18,968)	(18,968)
20	14				ON LONG-TERM DEBT	121,950	147,551
21	15				AMORTIZATION OF CAPITALIZED BOND PREMIUMS	561	561
22	16				DEBT SERVICE REASSIGNMENT INTEREST	31,431	23,072
23	17				NON-FEDERAL INTEREST	52,114	52,976
24	18				AFUDC	(40,657)	(40,446)
25	19				INTEREST INCOME	(9,560)	(15,137)
26	20				NET INTEREST EXPENSE	151,288	157,959
27							
28	21				TOTAL EXPENSES	987,160	1,022,755
29							
30	22				MINIMUM REQUIRED NET REVENUE 1/	109,810	86,447
31	23				PLANNED NET REVENUES FOR RISK	0	0
32	24				TOTAL PLANNED NET REVENUE	109,810	86,447
33							
34	25				TOTAL REVENUE REQUIREMENT	1,096,970	1,109,202
35							
36							
37	1/				SEE NOTE ON CASH FLOW TABLE.		
38							

	A	B	C	D	E	F	G
	TABLE 1-2						
	TRANSMISSION REVENUE REQUIREMENT STATEMENT OF CASH FLOWS						
	(\$000)						
39							
40							
41							
42						A	B
43						FY 2016	FY 2017
44	1	CASH FROM CURRENT OPERATIONS:					
45	2	MINIMUM REQUIRED NET REVENUE				109,810	86,447
46	3	DRAWDOWN OF CASH RESERVES FOR CAPITAL FUNDING				15,000	15,000
47	4	EXPENSES NOT REQUIRING CASH:					
48	5	DEPRECIATION & AMORTIZATION				239,852	259,210
49	6	TRANSMISSION CREDIT PROJECTS NET INTEREST				4,270	4,196
50	7	AMORTIZATION OF CAPITALIZED BOND PREMIUMS				561	561
51	8	CAPITALIZATION ADJUSTMENT				(18,968)	(18,968)
52	9	NON-CASH REVENUES/ACCRUAL REVENUES					
53	10	LGIA				(38,806)	(28,056)
54	11	AC INTERTIE CO/FIBER				(6,853)	(6,853)
55	12	CASH PROVIDED BY CURRENT OPERATIONS				304,865	311,536
56							
57	13	CASH USED FOR CAPITAL INVESTMENTS:					
58	14	INVESTMENT IN:					
59	15	UTILITY PLANT				(658,667)	(576,229)
60	16	CASH USED FOR CAPITAL INVESTMENTS				(658,667)	(576,229)
61							
62	17	CASH FROM TREASURY BORROWING AND APPROPRIATIONS:					
63	18	INCREASE IN LONG-TERM DEBT				643,667	561,229
64	19	DEBT SERVICE REASSIGNMENT PRINCIPAL				(185,303)	(199,991)
65	20	REPAYMENT OF CAPITAL LEASES				(1,392)	(1,486)
66	21	REPAYMENT OF LONG-TERM DEBT				(19,500)	(40,950)
67	22	REPAYMENT OF CAPITAL APPROPRIATIONS				(83,670)	(54,110)
68	23	CASH FROM TREASURY BORROWING AND APPROPRIATIONS				353,802	264,692
69							
70	24	ANNUAL INCREASE (DECREASE) IN CASH ^{1/}				-	-
71							
72	25	PLANNED NET REVENUE FOR RISK				-	-
73							
74	26	TOTAL ANNUAL INCREASE (DECREASE) IN CASH				-	-
75							
76							
77	1/ Line 24 must be greater than or equal to zero, otherwise net revenues						
78	will be added so that there are no negative cash flows for the year.						

2. SEGMENTATION OF TRANSMISSION REVENUE REQUIREMENT

2.1 Introduction

This chapter documents how the components of the transmission revenue requirements are allocated to the transmission segments, defined in the Transmission Segmentation Study and Documentation (BP-16-E-BPA-06). This allocation results in the segmented revenue requirements, which are used to develop proposed transmission and ancillary services rates. *See* Transmission Rates Study and Documentation, BP-16-E-BPA-07.

2.2 Segmentation

The allocation of the revenue requirement components to the transmission segments is described below.

Operations & Maintenance Expense (O&M)

BPA transmission O&M (*see* chapter 3 – Transmission Expenses) is segmented in three steps. Step 1: certain costs are directly assigned to the segments and Ancillary Services to which they are attributed: (1) costs for balancing reserve capacity to the Ancillary and Control Area Services that recover those costs; (2) the annual costs of transmission facilities owned and operated by the Corps of Engineers and Bureau of Reclamation to the Network and Utility Delivery segments; (3) costs associated with synchronous condensing and remedial action schemes for generation dropping to the Network and Southern Intertie segment; (4) costs associated with redispatch provided by Power Services to Transmission Services under Attachment M of the tariff to the Network segment; (5) portions of Transmission Services O&M (specifically, certain costs associated with the Ancillary Service of Scheduling, System Control and Dispatch (SCD)— the costs of the scheduling program, portions of the costs of the system operations program, and costs of related pilot programs) to Ancillary Services.

Step 2: the costs of the direct programs for operating and maintaining the transmission system are allocated between lines and substations according to the percentage share of historical O&M spending on lines and substations. *See* Transmission Segmentation Study and Documentation, BP-16-E-BPA-06, table 4c. The costs of these direct programs include all the remaining costs of the system operations program (those not assigned to SCD) and the costs of system maintenance and environmental operations programs. Then costs assigned to the lines and substations are allocated to the segments based on the percentage share of historical O&M spending that has been identified for each segment in the Transmission Segmentation Study and Documentation. Costs are allocated first to lines and substations and then to the segments because historically the division of costs between lines and substations has varied by segment and this method allows BPA to reflect the appropriate division of costs for lines and for substations by segment. Station service costs are allocated to the segments based on the percentage share of historical substation O&M in each segment. *See id.* This second step results in segmented direct O&M expenses.

Step 3: the directly assigned O&M in step 1 and segmented direct transmission O&M expenses in step 2 are summed for each segment, including ancillary services. The remaining expense programs (marketing, business support, engineering and corporate agency services, and costs associated with General Transfer Agreement (GTA) settlements) are then allocated to the

	A	B	C	D	E	F	G	H	I	J	K
1											
2		TABLE 2-1: SEGMENTATION OF O&M									
3		(\$000s)									
4											
5			A	B	C	D	E	F	G	H	
6	FY 2016		TOTAL	GENERATION		SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY	
7			FCRTS	INTEGRATION	NETWORK	INTERTIE	INTERTIE	DELIVERY	DELIVERY	SERVICES	
8	SEGMENTATION STUDY AVERAGES										
9	1	7-YEAR AVERAGE O&M: LINES	47,505	416	43,984	2,703	393	9	-	-	
10	2	7-YEAR AVERAGE O&M: SUBSTATIONS	96,966	2,442	76,097	15,084	501	1,672	1,170	-	
11	3	TOTAL 7-YEAR AVERAGE O&M (LN 2+3)	144,472	2,858	120,082	17,787	895	1,681	1,170	-	
12											
13	SYSTEM OPERATION, MAINTENANCE & ENVIRONMENT										
14	4	SYSTEM OPERATION ^{1/}	22,815								47,964
15	5	SYSTEM MAINTENANCE ^{2/}	153,324								
16	6	TOTAL TO SEGMENT (LN 4+5)	180,708								
17											
18	7	DIRECT LINES O&M	60,659	531	56,162	3,451	502	11	-	-	
19	8	DIRECT SUBS O&M	123,814	3,118	97,167	19,260	640	2,135	1,494	-	
20	9	DIRECT TRANSMISSION O&M SUBTOTAL (LN 7+8)	184,473	3,649	153,330	22,711	1,143	2,146	1,494	-	
21	10	SCHEDULING	11,110								11,110
22	11	TOTAL DIRECT TRANSMISSION O&M W/ANCILLARY SERVICES	251,982	3,649	153,330	22,711	1,143	2,146	1,494	67,508	
23											
24	OVERHEAD CATEGORIES										
25	12	MARKETING	18,033	261	10,973	1,625	82	154	107	4,831	
26	13	BUSINESS SUPPORT	47,811	692	29,093	4,309	217	407	283	12,809	
27	14	SYSTEM ENGINEERING	54,421	704	29,589	4,383	221	414	288	18,822	
28	15	CORPORATE	83,006	1,202	50,509	7,481	376	707	492	22,238	
29	16	OVERHEAD CATEGORIES SUBTOTAL (LN 12+13+14+15)	203,271	2,860	120,164	17,799	896	1,682	1,171	58,701	
30	17	TOTAL 2016 O&M (LN 11+16)	455,253	6,509	273,493	40,510	2,038	3,828	2,664	126,209	
31											
32	FY 2017										
33											
34	SEGMENTATION STUDY AVERAGES										
35	18	7-YEAR AVERAGE O&M: LINES	47,505	416	43,984	2,703	393	9	-	-	
36	19	7-YEAR AVERAGE O&M: SUBSTATIONS	96,966	2,442	76,097	15,084	501	1,672	1,170	-	
37	20	TOTAL 7-YEAR AVERAGE O&M (LN 18+19)	144,472								
38											
39	SYSTEM OPERATION, MAINTENANCE & ENVIRONMENT										
40	21	SYSTEM OPERATION ^{1/}	22,340								57,002
41	22	SYSTEM MAINTENANCE ^{2/}	164,272	-							
42	23	TOTAL TO SEGMENT (LN 21+22)	186,612								
43											
44	24	DIRECT LINES O&M	61,362	538	56,814	3,492	508	11	-	-	
45	25	DIRECT SUBS O&M	125,250	3,154	98,294	19,483	648	2,160	1,511	-	
46	26	DIRECT TRANSMISSION O&M SUBTOTAL (LN 24+25)	186,612	3,692	155,107	22,975	1,156	2,171	1,511	-	
47	27	SCHEDULING	11,376								11,376
48	28	TOTAL DIRECT TRANSMISSION O&M W/ANCILLARY SERVICES	254,990	3,692	155,107	22,975	1,156	2,171	1,511	68,378	
49											
50	OVERHEAD CATEGORIES										
51	29	MARKETING	18,426	267	11,208	1,660	84	157	109	4,941	
52	30	BUSINESS SUPPORT	51,657	748	31,423	4,654	234	440	306	13,852	
53	31	SYSTEM ENGINEERING	54,915	710	29,823	4,417	222	417	291	19,036	
54	32	CORPORATE/OTHER	84,815	1,228	51,592	7,642	385	722	503	22,744	
55	33	OVERHEAD CATEGORIES SUBTOTAL (LN 29+30+31+32)	209,813	2,952	124,045	18,374	924	1,736	1,208	60,573	
56	34	TOTAL 2017 O&M (LN 28+33)	464,803	6,644	279,152	41,348	2,080	3,908	2,720	128,950	
57											
58	1/ SYSTEM OPERATION EXPENSES NET OF ANCILLARY SERVICES										
59	2/ INCLUDES ENVIRONMENTAL OPERATIONS										

	A	B	C	D	E	F	G	H	I	J	K
60	TABLE 2-2										
61	INVESTMENT BASE										
62	(\$000s)										
63			A	B	C	D	E	F	G	H	
64			TOTAL	GENERATION		SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY	
65		FY 2016	FCRTS	INTEGRATION	NETWORK	INTERTIE	INTERTIE	DELIVERY	DELIVERY	SERVICES	
66	1	FCRTS INVESTMENT BASE	4,288,394	53,924	3,588,419	416,675	76,513	18,787	18,080	115,996	
67	2	PERCENT	100.00%	1.26%	83.68%	9.72%	1.78%	0.44%	0.42%	2.70%	
68											
69		FY 2017									
70	3	FCRTS INVESTMENT BASE	4,622,380	52,209	3,847,847	487,894	74,061	18,263	17,518	124,588	
71	4	PERCENT	100.00%	1.13%	83.24%	10.56%	1.60%	0.40%	0.38%	2.70%	
72											
73	TABLE 2-3										
74	SEGMENTATION OF DEPRECIATION										
75	(\$000s)										
76			A	B	C	D	E	F	G	H	
77			TOTAL	GENERATION		SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY	
78		FY 2016	FCRTS	INTEGRATION	NETWORK	INTERTIE	INTERTIE	DELIVERY	DELIVERY	SERVICES	
79	1	DIRECT DEPRECIATION	171,071	1,808	129,985	19,386	2,693	618	595	15,986	
80	2	PERCENTAGE OF DIRECT O&M W/OUT ANCILLARY SERVICES	100.00%	1.45%	60.85%	9.01%	0.45%	0.85%	0.59%	26.79%	
81	3	TRANSMISSION GENERAL PLANT	68,781	996	41,853	6,199	312	586	408	18,427	
82	4	TOTAL 2016 DEPRECIATION EXPENSE	239,852	2,804	171,838	25,585	3,005	1,204	1,003	34,413	
83											
84		FY 2017									
85	6	DIRECT DEPRECIATION	182,789	1,808	137,517	22,853	2,695	619	595	16,702	
86	7	PERCENTAGE OF DIRECT O&M W/OUT ANCILLARY SERVICES	100.00%	1.45%	60.83%	9.01%	0.45%	0.85%	0.59%	26.82%	
87	8	TRANSMISSION GENERAL PLANT	76,421	1,106	46,486	6,886	346	651	453	20,493	
88	9	TOTAL 2017 DEPRECIATION EXPENSE	259,210	2,914	184,003	29,739	3,041	1,270	1,048	37,195	
89											
90											
91											
92	TABLE 2-4										
93	SEGMENTATION OF INTEREST EXPENSE										
94	(\$000s)										
95			A	B	C	D	E	F	G	H	
96			TOTAL	GENERATION		SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY	
97		FY 2016	FCRTS	INTEGRATION	NETWORK	INTERTIE	INTERTIE	DELIVERY	DELIVERY	SERVICES	
98	1	TC PROJECTS INTEREST EXPENSE	6,729		6,166	564					
99	2	TC PROJECTS AFUDC	(2,460)		(2,460)						
100	3	TC PROJECTS NET INTEREST	4,270		3,706	564					
101	4	REMAINING NET INTEREST EXPENSE	147,019	1,849	123,021	14,285	2,623	644	620	3,977	
102	5	TOTAL 2016 NET INTEREST	151,288	1,849	126,727	14,849	2,623	644	620	3,977	
103											
104		FY 2017									
105	8	TC PROJECTS INTEREST EXPENSE	6,991		6,794	196					
106	9	TC PROJECTS AFUDC	(2,795)		(2,795)						
107	10	TC PROJECTS NET INTEREST	4,196		3,999	196					
108	11	REMAINING NET INTEREST EXPENSE	153,764	1,737	127,999	16,230	2,464	608	583	4,144	
109	12	TOTAL 2017 NET INTEREST	157,959	1,737	131,998	16,426	2,464	608	583	4,144	
110											
111											

	A	B	C	D	E	F	G	H	I	J	K
112											
		TABLE 2-5									
		SEGMENTATION OF PLANNED NET REVENUE									
113		(\$000s)									
114											
115											
116											
117											
118											
119											
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121											
122											
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132											
133											
134											
135											
		TABLE 2-6									
		SEGMENTATION OF TRANSMISSION ACQUISITION & ANCILLARY SERVICES									
136		(\$000s)									
137											
138											
139											
140											
141											
142											
143											
144											
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170											

	A	B	C	D
1	Table 2-7			
2	REVENUE REQUIREMENTS FOR ANCILLARY SERVICES			
3	(\$000s)			
4		A	B	
5		TOTAL	SCHEDULING,	
6		ANCILLARY	SYST CONTROL,	
7	FY 2016	SERVICES	& DISPATCH	
8	1	DIRECT O&M	83,238	68,038
9	2	OVERHEADS	58,701	58,701
10	3	TOTAL O&M	141,939	126,739
11	4	GENERATION INPUTS	101,027	0
12	5	DEPRECIATION	34,413	34,413
13	6	NET INTEREST EXPENSE	3,977	3,977
14	7	PLANNED NET REVENUE	2,220	2,220
15	8	TOTAL REV REQ	283,575	167,348
16				
17		TOTAL	SCHEDULING,	
18		ANCILLARY	SYST CONTROL,	
19	FY 2017	SERVICES	& DISPATCH	
20	9	DIRECT O&M	84,123	68,923
21	10	OVERHEADS	60,573	60,573
22	11	TOTAL O&M	144,695	129,495
23	12	GENERATION INPUTS	101,027	0
24	13	DEPRECIATION	37,195	37,195
25	14	NET INTEREST EXPENSE	4,144	4,144
26	15	PLANNED NET REVENUE	1,870	1,870
27	16	TOTAL REV REQ	288,932	172,705
28				

	A	B	C	D	E	F	G	H	I	J
1	Table 2-8									
2	SEGMENTED REVENUE REQUIREMENT									
3	(\$000s)									
4		A	B	C	D	E	F	G	H	
5			GENERATION		SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY	
6	FY 2016	TOTAL	INTEGRATION	NETWORK	INTERTIE	INTERTIE	DELIVERY	DELIVERY	SERVICES	
7	1 OPERATIONS & MAINTENANCE	455,253	6,509	273,493	40,510	2,038	3,828	2,664	126,209	
8	2 TRANSMISSION ACQUISITION & ANCILLARY SERVICES	140,767	130	21,445	2,028	80	272	55	116,757	
9	3 DEPRECIATION	239,852	2,804	171,838	25,585	3,005	1,204	1,003	34,413	
10	4 NET INTEREST EXPENSE	151,288	1,849	126,727	14,849	2,623	644	620	3,977	
11	5 PLANNED NET REVENUES	109,810	1,032	88,937	15,451	1,464	360	346	2,220	
12	6 TOTAL TRANSMISSION REVENUE REQUIREMENT	1,096,970	12,324	682,441	98,423	9,210	6,308	4,688	283,575	
13										
14			GENERATION		SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY	
15	FY 2017	TOTAL	INTEGRATION	NETWORK	INTERTIE	INTERTIE	DELIVERY	DELIVERY	SERVICES	
16	7 OPERATIONS & MAINTENANCE	464,803	6,644	279,152	41,348	2,080	3,908	2,720	128,950	
17	8 TRANSMISSION ACQUISITION & ANCILLARY SERVICES	140,782	126	21,431	2,056	74	271	54	116,772	
18	9 DEPRECIATION	259,210	2,914	184,003	29,739	3,041	1,270	1,048	37,195	
19	10 NET INTEREST EXPENSE	157,959	1,737	131,998	16,426	2,464	608	583	4,144	
20	11 PLANNED NET REVENUES	86,447	784	67,275	14,870	1,112	274	263	1,870	
21	12 TOTAL TRANSMISSION REVENUE REQUIREMENT	1,109,202	12,204	683,859	104,439	8,771	6,330	4,667	288,932	
22										

3. TRANSMISSION EXPENSES

3.1 Introduction

This chapter compiles the expenses that are included in transmission revenue requirements for the rate period.

3.2 Expenses

Table 3-1 displays the forecast program spending levels that are the basis for the revenue requirement study. O&M expenses came from the Integrated Program Review process; see Transmission Rates Study and Documentation, BP-16-E-BPA-07, section 2. Inter-business line expenses, including the cost of redispatch, are composed of two groups of costs. The first is the generation inputs for ancillary services. The second is the annual cost of Network segment facilities and Utility Delivery segment facilities of the Corps of Engineers and Bureau of Reclamation annual costs of those agencies. These inter-business line expenses are recovered by rates agreed to in the Generation Inputs settlement. *See* Fisher and Fredrickson, BP-16-E-BPA-12.

Depreciation and amortization expense is calculated using the straight-line method and remaining-life technique for lines, substations, and each of the FERC Accounts in the general plant category. *See* ch. 4.

Interest expense is calculated in the transmission repayment study using the capital appropriations and BPA revenue bonds issued to the U.S. Treasury at individual interest rates. See chapter 5 for calculation of the interest credit on cash reserves.

	A	B	C	D
1	Table 3-1			
2	TRANSMISSION PROGRAM SPENDING FORECAST			
3	(\$000s)			
4			A	B
5		PROGRAM & OTHER OPERATING COSTS	FY 2016	FY 2017
6	1	TRANSMISSION SYSTEM OPERATIONS		
7	2	INFORMATION TECHNOLOGY	10,377	10,558
8	3	POWER SYSTEM DISPATCHING	13,536	13,671
9	4	CONTROL CENTER SUPPORT	18,572	18,757
10	5	TECHNICAL OPERATIONS	14,436	14,538
11	6	SUBSTATION OPERATIONS	21,399	21,817
12	7	SUB-TOTAL TRANSMISSION SYSTEM OPERATIONS	78,320	79,342
13				
14	8	TRANSMISSION SCHEDULING		
15	9	SCHEDULING AFTER-THE-FACT	281	289
16	10	PRE-SCHEDULING	268	276
17	11	REAL-TIME SCHEDULING	5,038	5,169
18	12	RESERVATIONS	1,362	1,383
19	13	SCHEDULING TECHNICAL SUPPORT	4,161	4,259
20		SUB-TOTAL TRANSMISSION SCHEDULING	11,110	11,376
21				
22	16	TRANSMISSION MARKETING		
23	17	BUSINESS STRATEGY & ASSESSMENT	7,171	7,291
24	18	CONTRACT MANAGEMENT	4,862	4,984
25	19	TRANSMISSION BILLING	3,301	3,377
26	20	TRANSMISSION SALES	2,700	2,775
27	21	SUB-TOTAL TRANSMISSION MARKETING	18,033	18,426
28				
29	23	TRANSMISSION BUSINESS SUPPORT		
30	26	EXECUTIVE AND ADMIN SERVICES	24,235	27,540
31	27	LEGAL SUPPORT	3,331	3,548
32	28	TS INTERNAL GENERAL & ADMINISTRATIVE	12,961	13,135
33	29	AIRCRAFT SERVICES	2,205	2,230
34	30	LOGISTICS SERVICES	4,325	4,488
35	31	SECURITY ENHANCEMENTS	754	716
36	32	SUB-TOTAL TRANSMISSION BUSINESS SUPPORT	47,811	51,657
37				
38	33	TRANSMISSION ENGINEERING		
39	34	RESEARCH & DEVELOPMENT	9,522	9,555
40	35	TSD PLANNING & ANALYSIS	16,486	16,738
41	36	CAPITAL TO EXPENSE TRANSFER	4,307	4,351
42	37	NERC/WECC COMPLIANCE	14,636	14,654
43	38	ENVIRONMENTAL POLICY/PLANNING	1,599	1,642
44	39	ENG. LINE RATING	2,195	2,207
45	40	SUB-TOTAL TRANSMISSION ENGINEERING	48,746	49,147
46				

	A	B	C	D
1	Table 3-1			
2	TRANSMISSION PROGRAM SPENDING FORECAST			
3	(\$000s)			
4			A	B
5	PROGRAM & OTHER OPERATING COSTS		FY 2016	FY 2017
47	41 TRANSMISSION SYSTEM MAINTENANCE			
48	42 NON-ELECTRIC MAINTENANCE		30,750	31,424
49	43 SUBSTATION MAINTENANCE		28,566	29,043
50	44 TRANSMISSION LINE MAINTENANCE		27,054	27,482
51	45 SYSTEM PROTECTION CONTROL MAINTENANCE		13,541	13,741
52	46 POWER SYSTEM CONTROL MAINTENANCE		18,239	18,507
53	47 JOINT COST MAINTENANCE		111	113
54	48 SYSTEM MAINTENANCE MANAGEMENT		9,954	9,556
55	49 RIGHT OF WAY MAINTENANCE		10,098	10,162
56	50 POLLUTION PREVENTION & ABATEMENT		4,690	4,787
57	51 TECHNICAL TRAINING		2,368	2,418
58	52 VEGETATION MANAGEMENT		17,181	17,039
59	53 SUB-TOTAL TRANSMISSION SYSTEM MAINTENANCE		162,552	164,272
60				
61	58 SUB-TOTAL TRANSMISSION SYSTEM OPERATIONS & MAINTENANCE		366,572	374,220
62				
63	59 NON-BETWEEN BUSINESS LINE ANCILLARY SERVICES			
64	60 LEASED FACILITIES		7,447	7,447
65	61 SETTLEMENT AGREEMENTS		18	18
66	62 NON-BBL ANCILLARY SERVICES		18,560	18,560
67	63 TRANSMISSION RENEWABLES		1,313	1,328
68	64 SUB-TOTAL NON-BETWEEN BUSINESS LINE ANCILLARY SERVICES		27,338	27,353
69				
70	65 CORPORATE EXPENSES			
71	66 UNFUNDED RETIREMENT BENEFITS		19,143	19,748
72	67 CORPORATE OVERHEAD DISTRIBUTIONS		65,963	67,167
73	68 SUB-TOTAL CORPORATE CHARGES		85,106	86,915
74				
75	69 OTHER INCOME AND ADJUSTMENTS		(2,100)	(2,100)
76				
77	70 TOTAL TRANSMISSION IPR PROGRAM LEVELS		476,916	486,387

	A	B	C	D
1	Table 3-2			
2	SUMMARY OF TRANSMISSION REPAYMENT STUDY DATA			
3	(\$000s)			
4			A	B
5				
6			<u>2016</u>	<u>2017</u>
7				
8	1	DSR INTEREST	31,431	23,072
9	2	NON-FEDERAL/CAPITAL LEASES INTEREST	45,384	45,985
10	3	APPROPRIATION INTEREST	14,418	8,351
11	4	BOND INTEREST	<u>120,516</u>	<u>145,025</u>
12	5	TOTAL GROSS INTEREST	211,748	222,433
13	6			
14				
15	7	DSR PRINCIPAL	185,303	199,991
16	8	NON-FEDERAL/CAPITAL LEASE PRINCIPAL	1,392	1,486
17	9	APPROPRIATION PRINCIPAL	83,670	54,110
18	10	BOND PRINCIPAL	<u>19,500</u>	<u>40,950</u>
19	11	TOTAL PRINCIPAL	289,865	296,536
20				

	A	B	C	D
1	Table 3-3			
2	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION			
3	(\$000s)			
4				
5				
6	<u>PLANT FUNDED FROM BPA BORROWING</u>			
7			A	B
8			<u>2016</u>	<u>2017</u>
9	1	CAPITAL EXPENDITURES	640,306	562,305
10	2	PLANT-IN-SERVICE	618,174	755,608
11	3	SOY CWIP BALANCE	1,411,095	1,433,227
12	4	EOY CWIP BALANCE	1,433,227	1,239,924
13	5	AVERAGE CWIP BALANCE	1,422,161	1,336,576
14	6	AFUDC RATE	4.12%	4.32%
15	7	AFUDC FOR FEDERAL PROJECTS	37,500	36,954
16	8	CORPORATE CAPITAL (65% OF TOTAL)	18,361	13,924
17	9	CORPORATE AFUDC	697	697
18	10	TOTAL AFUDC FOR BPA BORROWING	38,197	37,651
19				
20	<u>PLANT FUNDED FROM REVENUES & BY THIRD PARTIES</u>			
21				
22	8	CAPITAL EXPENDITURES	10,000	10,000
23	9	PLANT-IN-SERVICE	5,000	5,000
24	10	SOY CWIP BALANCE	57,204	62,204
25	11	EOY CWIP BALANCE	62,204	67,204
26	12	AVERAGE CWIP BALANCE	59,704	64,704
27	13	AFUDC RATE	4.12%	4.32%
28	14	AFUDC FOR NON-FEDERAL PROJECTS	2,460	2,795
29				
30	15	TOTAL AFUDC	40,657	40,446
31				

	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Table 3-4												
3	AMORTIZATION OF PREMIUMS OF BOND REFINANCINGS												
4	(\$000s)												
5	A	B	C	D	E	F	G	H	I	J	K	L	
6													
7	DATE OF			NO. OF	MONTHLY	TYPE OF	LAST MONTH	<u>CALCULATION OF ANNUAL AMOUNTS</u>					
8	REFINANCING	PREMIUM	PRORATION	MONTHS	AMORTIZATION	BOND	TO AMORTIZE	2013	2014	2015	2016	2017	
9	1	1/0/1998		156	16,391	CONSTRUCTION	May-2011	-	-	-	-	-	
10	2	5/31/1998		408	15,495	CONSTRUCTION	May-2032	186	186	186	186	186	
11	3	8/31/1998		360	13,014	CONSTRUCTION	Aug-2028	156	156	156	156	156	
12	4	8/31/1998		360	18,222	CONSTRUCTION	Aug-2028	219	219	219	219	219	
13	5	Total			63,122			561	561	561	561	561	
14													

	A	B	C	D	E
1					
2		Table 3-5			
3		BETWEEN BUSINESS LINE COSTS			
4		(\$000s)			
5			A	B	C
6		INITIAL REVENUE REQUIREMENT	<u>2016</u>	<u>2017</u>	<u>AVERAGE</u>
7	1	ANCILLARY SERVICES	101,027	101,027	101,027
8	2	SYNCHRONOUS CONDENSING	1,610	1,610	1,610
9	3	GENERATION DROPPING	415	415	415
10	4	COE/RECLAMATION NETWORK/ DELIVERY FACILITIES SEGMENTATION	7,367	7,367	7,367
11	5	REDISPATCH	225	225	225
12	6	STATION SERVICE	<u>2,785</u>	<u>2,785</u>	<u>2,785</u>
13	7	TOTAL	113,429	113,429	113,429
14					
15					
16		REVISED REVENUE TEST	<u>2016</u>	<u>2017</u>	<u>AVERAGE</u>
17	8	ANCILLARY SERVICES	101,027	101,027	101,027
18	9	SYNCHRONOUS CONDENSING	1,610	1,610	1,610
19	10	GENERATION DROPPING	415	415	415
20	11	COE/RECLAMATION NETWORK/ DELIVERY FACILITIES SEGMENTATION	7,367	7,367	7,367
21	12	REDISPATCH	225	225	225
22	13	STATION SERVICE	<u>2,785</u>	<u>2,785</u>	<u>2,785</u>
23	14	TOTAL	113,429	113,429	113,429

	A	B	C	D
1	Table 3-6			
2	SUMMARY OF DEPRECIATION			
3	(\$000s)			
4				
5			A	B
6			<u>2016</u>	<u>2017</u>
7	1	TRANSMISSION PLANT		
8	2	LINES	71,837	75,629
9	3	SUBSTATION	80,592	87,802
10	4	STATION EQUIPMENT	2,369	2,786
11	5	GENERAL PLANT	82,398	90,337
12	6	INTANGIBLE ASSETS	353	353
13	7	REGULATORY ASSET	<u>2,303</u>	<u>2,303</u>
14	8	TOTAL	239,852	259,210
15				

	A	B	C	D
1	Table 3-7			
2	TRANSMISSION REGULATORY ASSETS			
3	(\$000s)			
4				
5			A	B
6			<u>FY 2016</u>	<u>FY 2017</u>
7	1	SPACER DAMPERS - 30 YR LIFE		
8	2	ADDITIONS	-	-
9	3	AMORTIZATION	936	936
10	4	SPACER DAMPERS - 25 YR LIFE		
11	5	ADDITIONS	-	-
12	6	AMORTIZATION	1,367	1,367
13	7	CAPITALIZED BOND PREMIUMS	561	561
14				

	A	B	C	D	E	F	G	H	I	J	K
1	Table 3-8										
2	AGENCY SERVICES G&A ALLOCATORS										
3											
4											
5			BP-16/IPR Rates			BP-14 Rates					
6		COST POOL	POWER	F&W	TRAN	POWER	F&W	TRAN	DRIVERS	COMMENTS	
7	1	G&A EXEC/PLANNING/GOVERNANCE	50%		50%	50%		50%	This is a 50-50% cost pool.	50-50% pools serve the general purposes of the agency. There is no consistent measurable method of assigning support costs directly to the beneficiary, they are not directly affected by changes in traditional cost drivers, and there is a lack of causal relationship.	
8	2	G&A APPLICATION SYSTEM SUPPORT	35%		65%	35%		65%	Preset IT application pool with WOs assigned to the pool based on BL benefits	There are two other cost pools for IT applications- one which applies a 50-50% rate and the other which applies a 100-100% rate. Applications put into this cost pool should benefit Power and Transmission 35-65%, respectively. The WO's in this pool are reviewed by the IT CMO office.	
9	3	G&A SECURITY SERVICES	10%	2%	88%	10%	2%	88%	Security* Tier 3 Dept support for Power and Trans	Allocation percents by department are provided by the Security Office. The percents by department are weighted by actual dollars spent by security departments.	
10	4	G&A LEGAL SERVICES	50%		50%	50%		50%	This is a 50-50% cost pool.	Legal Services direct charges a large portion of their costs. Costs not direct charged are posted to this cost pool.	
11	5	G&A HUMAN RESOURCE SERVICES	22%	2%	76%	20%	2%	78%	FTE count by Deptld by function	Update based on FTE count by Deptld. Dept FTE are assigned to Power and Transmission based on functions performed. FTE data comes from HR.	
12	6	G&A ACCOUNTING & FINANCE	45%		55%	45%		55%	Generally 50-50%; exceptions are Budget and Disbursements	Most Finance functions are allocated 50-50%. Exceptions are Budget and Disbursements. For these Depts, costs are allocated based on Power and Trans support by FTE for Budgets, headcount for Payroll, and number of Vouchers for Accounts Payable.	
13	7	G&A SAFETY	18%		82%	13%		87%	Allocation by Safety Office employee	Safety Office provides a list of employees and the percent of time they spend supporting Power, Transmission and Corporate.	
14	8	STRATEGIC INTEGRATION	50%		50%	50%		50%	This is a 50-50% cost pool.	As projects mature, they are passed to either Power or Transmission.	
15	9	RISK MANAGEMENT	60%		40%	60%		40%	CRO sets rate based on workload	Allocation percents by department are provided by the Risk Office.	
16	10	G&A IT ADMINISTRATION	31%		69%	34%		66%	Underlying IT cost pools	This cost pool is based on all other IT cost pools.	
17	11/12	DEDICATED IT PROJECTS	100%		100%	100%		100%	Dedicated IT projects	There are two cost pools for Dedicated IT Projects--one exclusively for Power and the other one for Transmission.	
18	13	G&A IT INFRASTRUCTURE	23%	2%	75%	24%	2%	74%	Number of IT devices by Deptld/employee by function	IT provides a detailed list of devices by Deptld by Employee. These are assigned to high level agency functions in support of Power, F&W and Transmission.	
19	14	G&A CROSS AGENCY IT PROJECTS	50%		50%	50%		50%	Preset pool with WOs assigned to the pool based on BL benefits	Very few projects are charged to this 50-50% pool.	
20	15	G&A WORKPLACE SERVICES	42%	5%	53%	38%	4%	58%	Square feet for space, FTE for other services	Includes GSA and other leases. Other services include printing, mail services, employee services, space management, office supplies, and office furniture.	
21	16	SUPPLY CHAIN ADMINISTRATION	7%		93%	7%		93%	Underlying Supply Chain cost pools	Rate is based on the underlying rates for all other Supply Chain cost pools.	
22	17	G&A PUBLIC AFFAIRS	45%	5%	50%	45%	5%	50%	This is a 50-50% cost pool.	Allocation percents by department are provided by the Office of Public Affairs.	
23	18	SUPPLY CHAIN PURCHASING SERVICES	39%	27%	34%	41%	26%	33%	Work Orders charged	The rate is determined by Work Order costs in this cost pool charged specifically to IT, EF&W, Power, etc.	
24	19	TECHNOLOGY INNOVATION	50%		50%	50%		50%	This is a 50-50% cost pool.	As projects mature, they are passed to either Power or Transmission.	
25	21/22	G&A WORKPLACE DIRECT PROJECTS	100%		100%	100%		100%	Dedicated workplace services projects	There are two cost pools for Workplace Direct Projects--one exclusively for Power and the other one for Transmission.	
26	23	BILLING & METERING SERVICES	47%		53%	52%		48%	Number of bills and metering support	Study looks at drivers such as the number of bills, complexity of bills, and metering services.	
27	24	CONTRACTING & FORECASTING SRVC	54%		46%	53%		47%	Number of contacts tasks and activities/forecasts	Based on manager analysis and input in support of contracting and forecasting.	
28											

4. FCRTS INVESTMENT BASE

4.1 Introduction

This chapter documents the development of the FCRTS investment for the rate period, which is the basis for annual depreciation expense calculations and the allocation of financing-related costs (net interest expense and planned net revenue) to the segments.

4.2 Methodology

The calculation of investment base for each year of the rate period starts with historical transmission plant investment, which is provided by the Transmission Segmentation Study and Documentation, BP-16-E-BPA-06. The general plant investment is identified according to FERC Account from BPA plant investment records. In addition, general plant investment for facilities required for Ancillary Services is separately identified and treated by FERC Account. The historical investment information includes plant investments associated with Projects Funded In Advance. Entities provide BPA with funding for exclusive use facilities and BPA retains ownership of the facilities. The facilities are excluded from general rate development, but depreciation of the facilities is included in BPA expenses. The depreciation calculated herein on these facilities is used for budgeting purposes, but neither the investment nor associated depreciation is incorporated into ratemaking.

Forecast plant additions, derived from capital budgets, are then added to the historical year investment. The additions are adjusted to take into account retirements. The ratio of retirements to additions based on an average of the most recent five years of actual data by FERC Account is applied to the additions in each year of the cost evaluation period. This procedure produces gross investment for lines, substations, and general plant accounts for each year of the cost evaluation period.

The gross investment is then reduced by accumulated depreciation. Depreciation is calculated using the straight-line method, remaining-life technique. For general plant categories, annual depreciation rates are used unadjusted. For lines and substations, the annual depreciation rate has been weighted by the depreciation rates of each FERC account that composes these facilities. Depreciation is calculated on gross plant investment in each plant category according to the category's group rates. For each forecast year, depreciation expense is added to the prior year's accumulated depreciation to establish the forecast of accumulated depreciation.

Calculation of the investment base for each of the segments for each of the rate period years starts with the average net plant investment for that year (gross investment less accumulated depreciation). Various adjustments are made to the calculated investment base to reflect plant not included in the Transmission Segmentation Study and Documentation's analysis of historical investment and additions, and to remove plant that was funded in advance by customer deposits. First, net investment related to intangible plant (capacity rights acquired by BPA) is added to the Network and Southern Intertie segments based on contract analysis. The regulatory asset net investment (spacer dampers) is added to the Network segment. Then, net investment in general plant categories is prorated to the segments based on the sum of all investments above. Next the

Network net plant investment is reduced by the net plant associated with LGIAs, and the Southern Intertie net plant investment is reduced by the net plant associated with the COI upgrade. The Southern Intertie net plant investment is also reduced to remove the balance of the unearned revenues associated with non-Federal capacity ownership on the AC Intertie. Finally, the unearned revenue balance associated with prepaid fiber optic leases is allocated to each segment pro rata based on the communications plant in each segment.

	A	B	C	D	E	F	G	H	I	J	K
	Table 4-1										
	BPA TRANSMISSION PLANT DEPRECIATION AND ACCUMULATED DEPRECIATION										
	(\$000s)										
1											
2											
3											
4											
5											
6											
7											
8											
9	1	LINES									
10	2	GENERATION-INTEGRATION	18,093	405	7,917	18,093	405	8,322	18,093	405	8,727
11	3	NETWORK	2,799,563	61,109	1,125,748	2,976,968	64,697	1,190,445	3,102,990	68,096	1,258,541
12	4	SOUTHERN INTERTIE	204,512	4,562	87,543	206,217	4,600	92,143	239,579	4,993	97,136
13	5	EASTERN INTERTIE	95,114	2,131	41,626	95,114	2,131	43,757	95,114	2,131	45,888
14	6	UTILITY DELIVERY	170	4	75	170	4	79	170	4	83
15	7	DSI DELIVERY	0	0	0	0	0	0	0	0	0
16	8	TOTAL LINES	3,117,452	68,211	1,262,909	3,296,561	71,837	1,334,746	3,455,946	75,629	1,410,375
17	9	PFIA	51,792	1,160	22,665	51,792	1,160	23,825	51,792	1,160	24,985
18	10	SUBSTATIONS									
19	11	GENERATION-INTEGRATION	64,340	1,403	26,003	64,340	1,403	27,406	64,340	1,403	28,809
20	12	NETWORK	2,773,092	58,631	999,001	2,991,458	62,834	1,061,835	3,152,261	66,967	1,128,802
21	13	SOUTHERN INTERTIE	658,340	14,088	251,550	679,664	14,584	266,134	940,337	17,658	283,792
22	14	EASTERN INTERTIE	25,753	559	10,285	25,836	562	10,847	25,914	564	11,411
23	15	UTILITY DELIVERY	28,118	612	11,305	28,175	614	11,919	28,216	615	12,534
24	16	DSI DELIVERY	27,288	595	11,028	27,288	595	11,623	27,288	595	12,218
25	17	TOTAL SUBSTATIONS	3,576,930	75,888	1,309,172	3,816,760	80,592	1,389,764	4,238,357	87,802	1,477,566
26	18	PFIA	75,396	1,644	30,471	75,396	1,644	32,115	75,396	1,644	33,759
27	19	INTANGIBLE PLANT	9,559	353	958	9,559	353	1,311	9,559	353	1,663
28	20	NETWORK	4,085	151	554	4,085	151	705	4,085	151	855
29	21	SOUTHERN INTERTIE	5,473	202	404	5,473	202	606	5,473	202	808
30											
31											
32											
33											
34											
35	1	TRANSMISSION PLANT									
36	2	LINES	68,211	71,837	75,629						
37	3	SUBSTATION	75,888	80,592	87,802						
38	4	STATION EQUIPMENT	2,074	2,369	2,786						
39	5	GENERAL PLANT	72,898	82,398	90,337						
40	6	INTANGIBLE PLANT	353	353	353						
41	7	REGULATORY ASSET	2,223	2,303	2,303						
42	8	TOTAL FOR RATES	221,647	239,852	259,210						
43	9	PFIA Trans	50,333	2,804	2,804						
44	10	PFIA GP	2,606	2,606	2,606						
45	11	TOTAL TS	274,586	245,262	264,620						

	A	B	C	D	E	F	G	H	I	J
1	Table 4-2									
2	INVESTMENT BASE									
3	(\$000s)									
4				A	B	C		D	E	F
5				BALANCE-AS-OF		AVERAGE		BALANCE-AS-OF		AVERAGE
6				2015	2016	2016		2016	2017	2017
7	COMPLETED PLANT									
8	1	GENERATION-INTEGRATION		82,433	82,433	82,433		82,433	82,433	82,433
9	2	NETWORK		5,576,740	5,972,511	5,529,484		5,972,511	6,259,337	5,862,117
10	3	SOUTHERN INTERTIE		868,325	891,354	862,607		891,354	1,185,388	939,806
11	4	EASTERN INTERTIE		120,867	120,949	120,808		120,949	121,028	120,920
12	5	UTILITY DELIVERY		28,288	28,345	28,275		28,345	28,386	28,328
13	6	DSI DELIVERY		27,288	27,288	27,288		27,288	27,288	27,288
14	7	REGULATORY ASSET		35,233	35,233	33,343		35,233	35,233	34,855
15	8	INTANGIBLE PLANT		8,968	8,968	8,968		8,968	8,968	8,968
16	9	ANCILLARY SERVICES		210,026	232,429	205,411		232,429	262,905	228,640
17	10	GENERAL PLANT		1,060,764	1,211,224	1,033,420		1,211,224	1,326,584	1,168,643
18	11	TOTAL COMPLETED PLANT		8,018,931	8,610,733	7,932,038		8,610,733	9,337,550	8,501,997
19	ACCUMULATED DEPRECIATION									
20	12	GENERATION-INTEGRATION		33,921	35,729	34,825		35,729	37,537	36,633
21	13	NETWORK		2,124,749	2,252,280	2,188,514		2,252,280	2,387,343	2,319,811
22	14	SOUTHERN INTERTIE		339,093	358,277	348,685		358,277	380,928	369,602
23	15	EASTERN INTERTIE		51,911	54,604	53,257		54,604	57,299	55,951
24	16	UTILITY DELIVERY		11,380	11,998	11,689		11,998	12,617	12,307
25	17	DSI DELIVERY		11,028	11,623	11,326		11,623	12,218	11,921
26	18	REGULATORY ASSET		8,423	10,726	9,575		10,726	13,030	11,878
27	19	INTANGIBLE PLANT		958	1,311	1,134		1,311	1,663	1,487
28	20	ANCILLARY SERVICES		95,009	110,995	103,002		110,995	127,697	119,346
29	21	GENERAL PLANT		434,124	502,905	468,515		502,905	579,326	541,116
30	22	TOTAL ACCUMULATED DEPRECIATION		3,110,595	3,350,447	3,230,521		3,350,447	3,609,658	3,480,052
31	NET PLANT INVESTMENT									
32	23	GENERATION-INTEGRATION		48,512	46,704	47,608		46,704	44,896	45,800
33	24	NETWORK		3,451,991	3,720,231	3,340,970		3,720,231	3,871,994	3,542,305
34	25	SOUTHERN INTERTIE		529,233	533,077	513,923		533,077	804,461	570,203
35	26	EASTERN INTERTIE		68,956	66,346	67,551		66,346	63,730	64,969
36	27	UTILITY DELIVERY		16,908	16,347	16,587		16,347	15,770	16,021
37	28	DSI DELIVERY		16,260	15,665	15,962		15,665	15,070	15,367
38	29	REGULATORY ASSET		26,810	24,506	23,768		24,506	22,203	22,977
39	30	INTANGIBLE PLANT		8,010	7,657	7,834		7,657	7,304	7,481
40	31	ANCILLARY SERVICES		115,017	121,433	102,409		121,433	135,207	109,294
41	32	GENERAL PLANT		626,640	708,318	564,906		708,318	747,258	627,527
42	33	TOTAL NET PLANT INVESTMENT		4,908,336	5,260,285	4,701,517		5,260,285	5,727,892	5,021,944
43										
44										
45										

	A	B	C	D	E	F	G	H
1	Table 4-3							
2	BPA PROJECTED TRANSMISSION PLANT INVESTMENT							
3	(\$000s)							
4		A	B	C	D	E	F	
5			TOTAL		TOTAL		TOTAL	
6		2015	2015	2016	2016	2017	2017	
7		ADDITIONS	INVEST	ADDITIONS	INVEST	ADDITIONS	INVEST	
8	1	GENERATION-INTEGRATION	0	82,433	0	82,433	0	82,433
9	2	NETWORK	310,158	5,572,655	395,771	5,968,426	286,826	6,255,252
10	3	SOUTHERN INTERTIE	25,932	842,639	23,028	885,880	294,035	1,179,915
11	4	EASTERN INTERTIE	188	120,867	82	120,949	79	121,028
12	5	UTILITY DELIVERY	49	28,288	57	28,345	41	28,386
13	6	DSI DELIVERY	0	28,288	0	27,288	0	27,288
14	7	REGULATORY ASSET	0	29,783	0	33,343	0	34,855
15	8	GENERAL PLANT	144,044	1,165,501	158,564	1,324,065	121,869	1,445,934
16	9	ANCILLARY SERVICES	12,751	101,521	14,298	115,819	23,967	139,786
17	10	INTANGIBLE - SPACER DAMPERS	<u>0</u>	<u>9,559</u>	<u>0</u>	<u>9,559</u>	<u>0</u>	<u>9,559</u>
18	11	TOTAL BPA	493,122	7,981,533	591,801	8,596,106	726,817	9,324,436
19								
20								
21								
22								
23								
24								
25								
26								
27								

	A	B	C	D	E	F	G	H	I	J	K
1	Table 4-4										
2	INVESTMENT BASE BY SEGMENT										
3	(\$000s)										
4		A	B	C	E	F	G	H	I		
5			GENERATION		SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY		
6		FY 2016	TOTAL	INTEGRATION	NETWORK	INTERTIE	DELIVERY	DELIVERY	SERVICES		
7	1	NET TRANSMISSION PLANT	4,105,009	47,608	3,340,970	513,923	67,551	16,587	15,962	102,409	
8	2	INTANGIBLE PLANT	7,834		3,348	4,485					
9	3	REGULATORY ASSET	23,768		23,768						
10	4	SUBTOTAL INVESTMENT	4,136,611	47,608	3,368,086	518,408	67,551	16,587	15,962	102,409	
11	5	PERCENT	100%	1.15%	81.42%	12.53%	1.63%	0.40%	0.39%	2.48%	
12	6	GENERAL PLANT	564,906	6,501	459,954	70,795	9,225	2,265	2,180	13,985	
13	7	TC PROJECTS (NET PLANT)	(236,632)		(226,515)	(10,117)					
14	8	ACC REV BAL ADJ - Fiber	(16,096)	(185)	(13,106)	(2,017)	(263)	(65)	(62)	(398)	
15	9	ACC REV BAL ADJ - 3AC	(160,394)			(160,394)					
16	10	INVESTMENT BASE	4,288,394	101,532	6,956,506	935,083	144,064	35,374	34,042	218,405	
17											
18				GENERATION	SOUTHERN	EASTERN	UTILITY	DSI	ANCILLARY		
19		FY 2017	TOTAL	INTEGRATION	NETWORK	INTERTIE	DELIVERY	DELIVERY	SERVICES		
20	11	NET TRANSMISSION PLANT	4,363,960	45,800	3,542,305	570,203	64,969	16,021	15,367	109,294	
21	12	INTANGIBLE PLANT	7,481		3,197	4,283					
22	13	REGULATORY ASSET	22,977		22,977						
23	14	SUBTOTAL INVESTMENT	4,394,417	45,800	3,568,479	574,487	64,969	16,021	15,367	109,294	
24	15	PERCENT	100%	1.04%	81.20%	13.07%	1.48%	0.36%	0.35%	2.49%	
25	16	GENERAL PLANT	627,527	6,540	509,583	82,037	9,278	2,288	2,194	15,607	
26	17	TC PROJECTS (NET PLANT)	(229,838)		(220,001)	(9,837)					
27	18	ACC REV BAL ADJ - Fiber	(12,578)	(131)	(10,214)	(1,644)	(186)	(46)	(44)	(313)	
28	19	ACC REV BAL ADJ - 3AC	(157,149)			(157,149)					
29	20	INVESTMENT BASE	4,622,380	98,009	7,416,327	1,062,381	139,030	34,283	32,885	233,882	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Table 4-5													
	CALCULATION OF RETIREMENT RATIOS													
	(\$000s)													
1														
2														
3														
4														
5	RETIREMENTS	A	B	C	D	E	F	G	H					
6		FERC							5-YEAR					
7		ACCOUNT	2009	2010	2011	2012	2013	TOTAL	AVERAGE					
8									ADDITIONS					
8	1	STRUCTURES/IMPROVEMENTS	352	194	343	424	1,132	289	2,380	476				
9	2	STATION EQUIPMENT	353	11,308	27,319	8,382	11,390	12,295	70,694	14,139				
10	3	TOWERS & FIXTURES	354	233	440	390	1,221	62	2,346	469				
11	4	POLES & FIXTURES	355	604	2,556	1,792	706	701	6,359	1,272				
12	5	OVERHEAD CONDUCTOR	356	80	1,177	1,433	1,001	457	4,148	830				
13	6	UNDERGROUND CONDUCTOR	358	0	12	(12)	0	0	0	0				
14	7	ROADS & TRAILS	359	10	17	71	0	6	103	21				
15														
31														
32	ADDITIONS	A	B	C	D	E	F	G	H	I	J	K	L	
33		FERC							5-YEAR	ADDITIONS				
34		ACCOUNT	2009	2010	2011	2012	2013	TOTAL	AVERAGE	NET OF	WEIGHTED	RATIO	WEIGHTED	
35									ADDITIONS	RETIREMENTS		(I/H)	RATIO (J/K)	
35	8	STRUCTURES/IMPROVEMENTS	352	10,086	7,821	9,169	12,218	26,098	65,391	13,078	12,602	0.0922	0.9636	0.0888
36	9	STATION EQUIPMENT	353	120,636	132,473	112,100	156,599	169,468	691,276	138,255	124,116	0.9078	0.8977	0.8150
37	10	STATION SUB-TOTAL (Lines 8+9)									136,719			0.9038
38	11	TOWERS & FIXTURES	354	461	16,070	6,739	106,865	4,546	134,681	26,936	26,467	0.3027	0.9826	0.2975
39	12	POLES & FIXTURES	355	10,670	43,086	23,976	16,255	13,061	107,047	21,409	20,138	0.2303	0.9406	0.2167
40	13	OVERHEAD CONDUCTOR	356	2,582	23,976	18,772	72,871	7,035	125,235	25,047	24,217	0.2770	0.9669	0.2678
41	14	UNDERGROUND CONDUCTOR	358	0	259	0	0	49	308	62	62	0.0007	1.0000	0.0007
42	15	ROADS & TRAILS	359	4,145	12,891	12,736	28,411	24,632	82,815	16,563	16,542	0.1892	0.9988	0.1890
43	16	LINES SUB-TOTAL (Lines 11+12+13+14+15)									87,426			0.9716
59														
60														
61														
62	RATIOS OF ADDITIONS NET OF RETIREMENTS													
63	17	SUBSTATIONS	0.9038											
64	18	LINES	0.9716											
65														

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Table 4-6 PROJECTED PLANT ADDITIONS													
1														
2														
3														
4			E	F	G	H	I	J	K	L	M	N	O	P
5														
6						TOTAL				TOTAL				TOTAL
7						2015				2016				2017
8						ADDITIONS	LINES	SUBS	OTHER	ADDITIONS	LINES	SUBS	OTHER	ADDITIONS
9	1	GENERATION-INTEGRATION	0	0	0	0	0	0	0	0	0	0	0	0
10	2	NETWORK	147,123	185,004	0	332,127	182,584	241,608	0	424,192	129,702	177,918	0	307,620
11	3	SOUTHERN INTERTIE	1,762	26,797	0	28,560	1,754	23,593	0	25,347	34,336	288,417	0	322,753
12	4	EASTERN INTERTIE	0	208	0	208	0	91	0	91	0	87	0	87
13	5	UTILITY DELIVERY	0	54	0	54	0	63	0	63	0	46	0	46
14	6	DSI DELIVERY	0	0	0	0	0	0	0	0	0	0	0	0
15	7	REGULATORY ASSET	0	0	4,000	4,000	0	0	0	0	0	0	0	0
16	8	GENERAL PLANT	0	0	156,795	156,795	0	0	172,862	172,862	0	0	145,836	145,836
17	9	TOTAL BPA	148,886	212,064	160,795	521,745	184,339	265,355	172,862	622,556	164,038	466,468	145,836	776,342
18														
19						TOTAL				TOTAL				TOTAL
20						2015				2016				2017
21						ADDITIONS	LINES	SUBS	OTHER	ADDITIONS	LINES	SUBS	OTHER	ADDITIONS
22	10	GENERATION-INTEGRATION	0	0	0	0	0	0	0	0	0	0	0	0
23	11	NETWORK	142,950	167,208	0	310,158	177,405	218,366	0	395,771	126,023	160,803	0	286,826
24	12	SOUTHERN INTERTIE	1,712	24,220	0	25,932	1,705	21,324	0	23,028	33,362	260,673	0	294,035
25	13	EASTERN INTERTIE	0	188	0	188	0	82	0	82	0	79	0	79
26	14	UTILITY DELIVERY	0	49	0	49	0	57	0	57	0	41	0	41
27	15	DSI DELIVERY	0	0	0	0	0	0	0	0	0	0	0	0
28	16	REGULATORY ASSET	0	0	4,000	4,000	0	0	0	0	0	0	0	0
29	17	GENERAL PLANT	0	0	156,795	156,795	0	0	172,862	172,862	0	0	145,836	145,836
30	18	TOTAL BPA	144,662	191,664	160,795	497,122	179,109	239,830	172,862	591,801	159,384	421,597	145,836	726,817

	A	B	C	D	E	F	G	H	I	J	K	L	
1	Table 4-7												
2	AMORTIZATION OF BPA TRANSMISSION OTHER DEFERRED ASSETS												
3	(\$000s)												
4	SPACER DAMPERS												
5	30-YEAR SERVICE LIFE												
6													
7		A	B	C	D	E	F	G	H	I	J		
8			PARTIAL YEAR	FULL YEAR	ANNUAL	ACCUMULATED	CUMULATIVE	DEFERRED	NET	ORIGINAL			
9		FY INVESTMENT	AMORTIZATION	AMORTIZATION	AMORTIZATION	AMORTIZATION	INVESTMENT	INVESTMENT	INVESTMENT	INVESTMENT	RETIREMENT		
10	1	2006	1,094	45	36	0	1,094	5,696		2,728	(1,634)		
11	2	2007	1,123	46	37	0	2,216	5,200		2,800	(1,677)		
12	3	2008	9,658	334	322	0	11,875		11,875	24,091	(14,433)		
13	4	2009	1,119	37	37	0	12,993		12,993	2,790	(1,671)		
14	5	2010	2,688	66	90	0	15,681		15,681	6,704	(4,016)		
15	6	2011	7,802	130	260	1,630	23,483		21,853	39,113	(23,431)		
16	7	2012	3,888	67	130	850	2,480		24,891				
17	8	2013	715	25	24	937	3,417		24,669				
18	9	2014	0	0	0	921	4,321		23,331				
19	10	2015	0	0	0	921	5,242		22,410				
20	11	2016	0	0	0	921	6,163		21,489				
21	12	2017	0	0	0	921	7,084		20,568				
22	13	2018	0	0	0	921	8,005		19,647				
23	14	2019	0	0	0	921	8,926		18,726				
24	15	2020	0	0	0	921	9,847		17,805				
25													
26		FY 2008 investment = 9,617 plus total deferred investment from 2006 and 2007.											
27		FY 2011: retirement of \$23,431 of impaired assets											
28													
29		SPACER DAMPERS											
30		25-YEAR SERVICE LIFE											
31													
32		A	B	C	D	E	F	G	H				
33			PARTIAL YEAR	FULL YEAR	ANNUAL	ACCUMULATED	CUMULATIVE	DEFERRED	NET				
34		FY INVESTMENT	AMORTIZATION	AMORTIZATION	AMORTIZATION	AMORTIZATION	INVESTMENT	INVESTMENT	INVESTMENT				
35	16	2012	13,020	136	521	136	13,020	0	12,884				
36	17	2013	9,662	132	386	653	22,682	0	21,893				
37	18	2014	7,500	150	300	1,057	30,182	0	28,336				
38	19	2015	4,000	80	160	1,287	34,182	0	31,049				
39	20	2016	0	0	0	1,367	34,182	0	29,681				
40	21	2017	0	0	0	1,367	34,182	0	28,314				
41	22	2018	0	0	0	1,367	34,182	0	26,947				
42	23	2019	0	0	0	1,367	34,182	0	25,580				
43	24	2020	0	0	0	1,367	34,182	0	24,212				
44													
45													
46		Modified Table- Added Original Investment and Retirements and 25 year life amortization table											

	A	B	C	D	E	F	G	H	I	J	K
1	TABLE 4-8										
2	DEPRECIATION OF CUSTOMER-FUNDED INVESTMENTS										
3	(\$000s)										
4	LARGE GENERATOR INTERCONNECTION AGREEMENTS										
5											
6		A	B	C	D	E	F	G	H	I	J
7				TOTAL					ACCUMULATED		
8			CUMULATIVE	ANNUAL			DEPRECIATION		DEPRECIATION		
9		IN-SERVICE	INVESTMENT	INVESTMENT	LINES	SUBSTATIONS	LINES	SUBSTATIONS	LINES	SUBSTATIONS	TOTAL
10	1	2006	6,980	6,980	768	6,212	8	77	8	77	85
11	2	2007	33,827	26,847	2,953	23,894	49	453	57	530	587
12	3	2008	56,641	22,814	2,510	20,304	108	1,004	165	1,534	1,699
13	4	2009	128,460	71,819	7,900	63,919	220	2,054	385	3,588	3,973
14	5	2010	136,700	8,240	1,086	7,154	317	2,940	702	6,528	7,230
15	6	2011	194,898	58,198	3,446	54,752	366	3,712	1,068	10,240	11,308
16	7	2012	216,898	22,000	3,300	18,700	439	4,628	1,507	14,868	16,375
17	8	2013	265,102	48,204	7,299	40,905	554	5,371	2,061	20,240	22,301
18	9	2014	265,102	-	-	-	633	5,881	2,694	26,121	28,815
19	10	2015	265,102	-	-	-	633	5,881	3,327	32,003	35,330
20	11	2016	265,102	-	-	-	633	5,881	3,960	37,884	41,844
21	12	2017	265,102	-	-	-	633	5,881	4,592	43,765	48,358
22											
23											
24	CALIFORNIA-OREGON INTERTIE (COI)										
25											
26				TOTAL					ACCUMULATED		
27			CUMULATIVE	ANNUAL			DEPRECIATION		DEPRECIATION		
28		IN-SERVICE	INVESTMENT	INVESTMENT	LINES	SUBSTATIONS	LINES	SUBSTATIONS	LINES	SUBSTATIONS	TOTAL
29	13	2012	11,238	11,238	0	11,238	0	140	0	140	140
30	14	2013	11,238	0	0	0	0	280	0	420	420
31	15	2014	11,238	0	0	0	0	280	0	701	701
32	16	2015	11,238	0	0	0	0	280	0	981	981
33	17	2016	11,238	0	0	0	0	280	0	1,261	1,261
34	18	2017	11,238	0	0	0	0	280	0	1,541	1,541
35											

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Table 4-9													
2	BPA GENERAL PLANT CUMULATIVE INVESTMENT													
3	(\$000s)													
4		A	B	C	D	E	F	G	H	I	J	K	L	
5			DEPR	FY 2014	FY 2015	FY 2015	FY 2015	FY 2016	FY 2016	FY 2016	FY 2017	FY 2017	FY 2017	
6			ACCRL	TOTAL	DEPR	ACCUM	TOTAL	DEPR	ACCUM	TOTAL	DEPR	ACCUM	TOTAL	
7		FERC	RATE	INVEST	EXPENSE	DEPR	INVEST	EXPENSE	DEPR	INVEST	EXPENSE	DEPR	INVEST	
8		ACCT												
9	1	LAND & LAND RIGHTS	389	0.0642	7,339	854	3,627	19,258	1,524	5,151	28,204	2,096	7,247	37,096
10	2	STRUCTURES & IMPROVEMENTS	390	0.0178	260,328	5,096	65,556	312,203	6,131	71,687	376,700	7,060	78,747	416,558
11	3	OFFICE FURNITURE & FIXTURES	391.1	0.0527	2,180	115	1,685	2,180	115	1,800	2,180	115	1,915	2,180
12	4	DATA PROCESSING -EQUIPMENT	391.2	0.1327	0	0	0	0	0	0	0	0	0	0
13	5	DATA PROCESSING -SOFTWARE	391.3	0.1710	9,842	2,457	3,298	18,896	3,924	7,222	27,000	5,174	12,396	33,509
14	6	TRANSPORT EQUIPMENT	392.1	0.0333	64,227	2,234	23,725	69,927	2,422	26,147	75,543	2,617	28,764	81,659
15	7	HELICOPTERS	392.2	0.0332	9,234	307	2,705	9,234	307	3,012	9,234	307	3,319	9,234
16	8	AIRPLANES	392.3	0.0630	8,656	545	4,065	8,656	545	4,610	8,656	545	5,155	8,656
17	9	STORES EQUIPMENT	393	0.0391	1,318	52	171	1,318	52	223	1,318	52	275	1,318
18	10	TOOLS, SHOP & GARAGE EQUIPMENT	394	0.0410	14,121	657	3,911	17,945	813	4,724	21,710	971	5,695	25,659
19	11	LAB EQUIPMENT	395	0.0688	31,996	2,201	20,330	31,996	2,201	22,531	31,996	2,201	24,732	31,996
20	12	POWER OPERATED EQUIPMENT	396	0.0540	30,387	1,641	14,850	30,387	1,641	16,491	30,387	1,641	18,132	30,387
21	13	COMMUNICATIONS EQUIPMENT	397	0.0569	439,072	26,297	207,558	485,257	29,013	236,571	534,531	31,627	268,198	577,153
22	14	MISC EQUIPMENT	398	0.0670	33,868	2,269	17,199	33,868	2,269	19,468	33,868	2,269	21,737	33,868
23	15	SUBTOTAL GENERAL PLANT			912,569	44,725	368,680	1,041,126	50,957	419,637	1,181,329	56,675	476,312	1,289,274
24														
25		CORPORATE ASSIGNMENT												
26	18	OFFICE FURNITURE & FIXTURES	391.1	0.05270	987	52	987	987	0	987	987	0	987	987
27	19	DATA PROCESSING -EQUIPMENT	391.2	0.13270	29,453	3,908	20,620	29,453	3,908	24,528	29,453	3,908	28,436	29,453
28	20	DATA PROCESSING -SOFTWARE	391.3	0.17100	52,967	9,901	37,596	62,834	11,522	49,118	71,929	12,904	62,022	78,991
29	21	COMMUNICATIONS EQUIPMENT	397	0.05690	0	0	0	0	0	0	0	0	0	0
30	22	MISC EQUIPMENT	398	0.06700	25,481	1,895	6,254	31,101	2,394	8,648	40,368	2,934	11,582	47,229
31	23	SUBTOTAL CORPORATE ASSIGNMENT			108,888	15,756	65,444	124,375	17,824	83,268	142,736	19,746	103,014	156,660
32														
33	24	TOTAL GENERAL PLANT			1,021,456	60,481	434,124	1,165,501	68,781	502,905	1,324,065	76,421	579,326	1,445,934

	A	B	C	D	E	F
1	Table 4-10					
2	BPA TRANSMISSION GENERAL PLANT PROJECTED PLANT ADDITIONS					
3	(\$000s)					
4			A	B	C	D
5			FERC	2015	2016	2017
6			ACCT	ADDTNS	ADDTNS	ADDTNS
7	1	LAND & LAND RIGHTS	389	11,920	8,946	8,892
8	2	STRUCTURES & IMPROVEMENTS	390	51,874	64,498	39,858
9	3	OFFICE FURNITURE & FIXTURES	391.1	0	0	0
10	4	DATA PROCESSING -EQUIPMENT	391.2	0	0	0
11	5	DATA PROCESSING -SOFTWARE	391.3	9,054	8,105	6,509
12	6	TRANSPORT EQUIPMENT	392.1	5,700	5,616	6,115
13	7	HELICOPTERS	392.2	0	0	0
14	8	AIRPLANES	392.3	0	0	0
15	9	STORES EQUIPMENT	393	0	0	0
16	10	TOOLS, SHOP & GARAGE EQUIPMENT	394	3,824	3,765	3,949
17	11	LAB EQUIPMENT	395	0	0	0
18	12	POWER OPERATED EQUIPMENT	396	0	0	0
19	13	COMMUNICATIONS EQUIPMENT	397	46,186	49,273	42,622
20	14	MISC EQUIPMENT	398	0	0	0
21	15	SUBTOTAL GENERAL PLANT		128,557	140,203	107,945
22	16	STATION EQUIPMENT	353	12,751	14,298	23,967
23	17	TOTAL GENERAL PLANT		141,308	154,501	131,912
24						
25	CORPORATE ASSIGNMENT					
26	18	OFFICE FURNITURE & FIXTURES	391.1	0	0	0
27	19	DATA PROCESSING -EQUIPMENT	391.2	0	0	0
28	20	DATA PROCESSING -SOFTWARE	391.3	9,867	9,095	7,062
29	21	COMMUNICATIONS EQUIPMENT	397	0	0	0
30	22	MISC EQUIPMENT	398	5,621	9,266	6,861
31	23	TOTAL CORPORATE ASSIGNMENT		15,487	18,361	13,924
32						

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Table 4-11												
	ANCILLARY SERVICES												
	SCHEDULING, SYSTEM CONTROL, AND DISPATCH SERVICES												
	(\$000s)												
1													
2													
3													
4													
5													
6	PLANT ADDITIONS												
7	FERC ACCOUNT												
8		A	B	C									
9		2015	2016	2017									
10	1	353	12,751	14,298	23,967								
11	2	391.2	0	0	0								
12	3	391.3	9,054	8,105	6,509								
13	4	397	0	0	0								
14	5	Total	21,805	22,402	30,476								
15													
16													
17													
18	FERC ACCOUNT												
19		A	B	C	D	E	F	G	H	I	J	K	
20		DEPR	2014	2015	2015	2015	2016	2016	2016	2017	2017	2017	
21		ACCRL	TOTAL	DEPR	ACCUM	TOTAL	DEPR	ACCUM	TOTAL	DEPR	ACCUM	TOTAL	
22		RATE	INVEST	EXP	DEPR	INVEST	EXP	DEPR	INVEST	EXP	DEPR	INVEST	
23	6	353	0.02180	88,770	2,074	31,960	101,521	2,369	34,329	115,819	2,786	37,115	139,786
24	7	391.2	0.13270	9,171	1,217	8,221	9,171	950	9,171	9,171	0	9,171	9,171
25	8	391.3	0.17100	46,354	8,701	32,586	55,408	10,168	42,754	63,513	11,417	54,171	70,021
26	9	397	0.05690	43,926	2,499	22,242	43,926	2,499	24,741	43,926	2,499	27,240	43,926
27	10	Total		188,221	14,491	95,009	210,026	15,986	110,995	232,429	16,702	127,697	262,905
28													
29													
30													
31													
32													
33													
34													
35	ACCUMULATED DEPRECIATION												
36	16	353	31,960	34,329	33,144	34,329	37,115	35,722					
37	17	391.2	8,221	9,171	8,696	9,171	9,171	9,171					
38	18	391.3	32,586	42,754	37,670	42,754	54,171	48,462					
39	19	397	22,242	24,741	23,492	24,741	27,240	25,991					
40	20	Total	95,009	110,995	103,002	110,995	127,697	119,346					
41													
42	NET PLANT INVESTMENT												
43	21	353	69,561	81,490	75,526	81,490	102,671	92,081					
44	22	391.2	950	0	475	0	0	0					
45	23	391.3	22,822	20,759	21,790	20,759	15,850	18,305					
46	24	397	21,684	19,185	20,434	19,185	16,686	17,935					
47	25	Total	115,017	121,433	118,225	121,433	135,207	128,320					

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5. PROJECTED CASH BALANCES/INTEREST CREDITS

5.1 Introduction

This chapter projects Transmission Services' cash balances for the rate period and estimates the interest income (credits) to be earned on BPA's projected cash balances and on annual funds to be returned to the U.S. Treasury.

5.2 Interest credits on BPA's projected cash balances

The beginning rate period cash balance was derived from BPA's business unit cash analysis for the end of FY 2012 and from current forecasts of transmission revenues, expenses, and cash flows for FY 2013. The annual incremental cash provided from forecast net revenues is added to the beginning cash balance for revenue requirements and the current and revised revenue tests. Reserves during the rate period are reduced by \$15 million each year for the funding of capital expenditures in lieu of U.S. Treasury borrowing. Using the existing interest earnings rate, annual interest income is calculated from projected average annual cash balances. The resulting interest income is applied as a credit against interest expense in the transmission revenue requirements and in the income statements of the current and revised revenue tests.

5.3 Interest credits on funds held for others

The projected interest earnings rate is multiplied by the funds held for others (FHFO) average cash balance for each year to determine the annual interest income. The resulting interest income is applied as a credit against interest expense in the transmission revenue requirement.

5.4 Interest income (repayment program calculation)

Separately, interest income rates listed in this chapter are calculated and used within the repayment program to calculate an interest credit based on the average cash necessary to pay the interest, bond call premiums, and amortization payments calculated by the study for return to the U.S. Treasury in each study year. The repayment program assumes the cash accumulates at a uniform rate throughout the year, except for interest paid on bonds issued to the U.S. Treasury at mid-year. At the end of the year, the cash balance, together with the interest credit earned thereon, is used in the program for payment of interest expense, amortization of the Federal investment, and payment of bond premiums.

	A	B	C	D
1				
2		Table 5-1		
3		INTEREST INCOME FROM PROJECTED CASH BALANCES		
4		REVENUE REQUIREMENT DEVELOPMENT		
5		(\$000s)		
6			A	B
7			<u>2016</u>	<u>2017</u>
8	1	ANNUAL CASH SURPLUS/(DEFICIT)	-	-
9				
10	2	ADJUSTMENTS TO CASH	(15,000)	(15,000)
11				
12	3	SOY CASH BALANCE	419,500	404,500
13	4	EOY CASH BALANCE	404,500	389,500
14	5	AVERAGE CASH BALANCE	412,000	397,000
15				
16	6	INTEREST INCOME RATE	1.59%	2.84%
17				
18	7	INTEREST ON BPA FUND/INVESTMENTS (LN 5 X LN 6)	6,551	11,275
19	8	REPAYMENT STUDY INTEREST INCOME	1,434	2,526
20				
21		INTEREST EARNED ON FUNDS HELD FOR OTHERS		
22	9	SOY CASH BALANCE	133,000	40,000
23	10	EOY CASH BALANCE	40,000	40,000
24	11	AVERAGE CASH BALANCE	86,500	40,000
25	12	INTEREST ON FUNDS HELD FOR OTHERS (LN 11 X LN 6)	1,375	1,136
26	13	TRUSTEE INTEREST INCOME	200	200
27				
28	14	TOTAL ANNUAL INTEREST INCOME (LN 7+8+12+13)	9,560	15,137

	A	B	D	E
1				
2		Table 5-2		
3		INTEREST INCOME FROM PROJECTED CASH BALANCES		
4		REVENUES FROM CURRENT RATES		
5		(\$000s)		
6			A	B
7			<u>2016</u>	<u>2017</u>
8	1	ANNUAL CASH SURPLUS/(DEFICIT)	(64,100)	(70,352)
9				
10	2	ADJUSTMENTS TO CASH	(15,000)	(15,000)
11				
12	3	SOY CASH BALANCE	419,500	340,400
13	4	EOY CASH BALANCE	340,400	255,048
14	5	AVERAGE CASH BALANCE	379,950	297,724
15				
16	6	INTEREST INCOME RATE	1.59%	2.84%
17				
18	7	INTEREST ON BPA FUND/INVESTMENTS (LN 5 X LN 6)	6,041	8,455
19	8	REPAYMENT STUDY INTEREST INCOME	1,434	2,526
20				
21		INTEREST EARNED ON FUNDS HELD FOR OTHERS		
22	9	SOY CASH BALANCE	133,000	40,000
23	10	EOY CASH BALANCE	40,000	40,000
24	11	AVERAGE CASH BALANCE	86,500	40,000
25	12	INTEREST INCOME (LN 11 X LN 6)	1,575	1,336
26	13	TRUSTEE INTEREST INCOME	200	200
27				
28	14	TOTAL ANNUAL INTEREST INCOME (LN 7+8+12+13)	9,050	12,318
29				
30				
31				
32				

	A	B	D	E
1	Table 5-3			
2	INTEREST INCOME FROM PROJECTED CASH BALANCES			
3	REVENUES FROM PROPOSED RATES			
4	(\$000s)			
5			A	B
6			2016	2017
7				
8	1	ANNUAL CASH SURPLUS/(DEFICIT)	-	-
9				
10	2	ADJUSTMENTS TO CASH	(15,000)	(15,000)
11				
12	3	SOY CASH BALANCE	419,500	404,500
13	4	EOY CASH BALANCE	404,500	389,500
14	5	AVERAGE CASH BALANCE	412,000	397,000
15				
16	6	INTEREST INCOME RATE	1.59%	2.84%
17				
18	7	INTEREST ON BPA FUND/INVESTMENTS (LN 5 X LN 6)	6,551	11,275
19	8	REPAYMENT STUDY INTEREST INCOME	1,434	2,526
20				
21	INTEREST EARNED ON FUNDS HELD FOR OTHERS			
22	9	SOY CASH BALANCE	133,000	40,000
23	10	EOY CASH BALANCE	40,000	40,000
24	11	AVERAGE CASH BALANCE	86,500	40,000
25	12	INTEREST INCOME (LN 11 X LN 6)	1,375	1,136
26	13	TRUSTEE INTEREST INCOME	200	200
27				
28	14	TOTAL ANNUAL INTEREST INCOME (LN 7+8+12+13)	9,560	15,137
29				
30				
31				

6. INTEREST RATES AND PRICE DEFLATORS

6.1 Introduction

Interest rates on bonds issued by BPA to the U.S. Treasury are used in development of repayment studies and projections of Federal interest expense in revenue requirements.

6.2 Source of Forecasts

To project interest rates on bonds issued to the U.S. Treasury, BPA uses U.S. Treasury yield curve forecasts provided by the IHS Global Insights Group (GI). GI is also the source of price deflators that BPA treats as escalators for purposes of developing spending levels. GI develops the price deflators taking into account projections of Gross Domestic Product (GDP). The GDP consists of the sum of consumption, investment, government purchases, and net exports, excluding transfers to foreigners.

6.3 Interest Rate Projections

Projected interest rates for BPA bonds issued to the U.S. Treasury are based on GI's yield curve projections of U.S. Treasury market rates, plus a markup of up to 190 basis points, depending on the length of time to maturity and call options. The markup estimate reflects an interagency agreement that the U.S. Treasury will price BPA bonds at a level comparable to the price for securities (bonds) issued by U.S. government corporations. The markup estimate reflects the average basis point markup on recent intermediate and long-term bonds issued by BPA.

6.4 Deflators

The current and cumulative price deflators used to escalate midyear dollars are derived from the fiscal and calendar year price deflators provided by GI. They are calculated as follows:

$$[(FY1/100) \times 0.5] + 1 = \text{Cumulative Price Deflator}_1$$

Thus, the fiscal year GDP price deflator for the current year is divided by one hundred and multiplied by one-half. The result, when added to one, yields the cumulative price deflator for the first year.

$$[1 + (FY_t/100)] \times \text{Cumulative Price Deflator}_{t-1} = \text{Cumulative Price Deflator}_t, \text{ when } t > 1$$

Thus, the fiscal year GDP price deflator for a future year is divided by one hundred and added to one. The result, when multiplied by the cumulative price deflator from the previous year, yields the cumulative price deflator for each successive year.

When deflators are used in developing the FY 2016–2017 spending levels, they are based on the price deflators from the September 2013 GI Base Case forecast.

memorandum

DATE:

REPLY TO
ATTN OF: FTC-2

SUBJECT: FY 2014 Interest Rate and Inflation Forecast

TO: See Attached "cc:" List

Please see the attached BPA interest rate and inflation forecast for the period FY 2014 through 2043.

These forecasts provide an internally consistent basis for BPA decisions regarding debt management, budget formulation and other financial analyses, as well as capital budgeting and strategic planning efforts. The FY 2014 forecast is summarized in the following tables:

- Table 1: 30 Year Treasury Yields and BPA Borrowing Rates
- Table 2: Forecast Comparison – 30 Year BPA Borrowing Rate – Callable at Par
- Table 3: 20 Year Treasury Yields and BPA Borrowing Rates
- Table 4: 15 Year Treasury Yields and BPA Borrowing Rates
- Table 5: BPA FY 2014 Appropriation Borrowing Rate Forecast
- Table 6: BPA FY 2014 BPA Borrowing Rate – No Premium
- Table 7: BPA FY 2014 BPA Borrowing Rate – Coupon Scale-Down Redemption Premium
- Table 8: BPA FY 2014 BPA Borrowing Rate – Callable at Par
- Table 9: BPA FY 2014 Third-Party Taxable Borrowing Rate Forecast
- Table 10: BPA FY 2014 Third-Party Tax-Exempt Borrowing Rate Forecast
- Table 11: BPA FY 2014 FERC Borrowing Rate (Bank Prime) Forecast
- Table 12: BPA FY 2014 May 3-Month LIBOR Rate Forecast
- Table 13: Comparison of FY 2014 Inflation Forecast Components

Borrowing Rate Forecast Methodology

The FY 2014 forecast is based on the Global Insight (GI) Third Quarter September 2013 Long-Term Economic Outlook.

Tables 1, 3 and 4 illustrate the components of BPA's Treasury borrowing rate forecasts. GI calendar year (CY) projections of 30-year Treasury bond yields are shown in Column A. BPA fiscal year (FY) projections are shown in Column B. Column C, D and E reflect BPA's Treasury borrowing rate options.

BPA borrowing rates from the U.S. Treasury reflect a mark-up over the Treasury yield curve. Table 6 is the Government Agency borrowing rate spread over the Treasury yield curve and reflects the rate BPA would borrow at without a call premium. The other two rates {Table 7 and Table 8} reflect the two additional borrowing options BPA

can exercise with Treasury: callable at par and coupon-scale down. A callable at par call option allows BPA to redeem the bond before maturity without paying a call premium at the time of the call. The cost of this call option results in a mark-up to the coupon rate, resulting in higher interest expense paid over the life of the bond. With a coupon scale down call option the call premium is determined at the time of bond issuance for each option call date over the bond's term; this call premium is only paid if the bond is called. In addition to paying a call premium at the time the bond is called, there is also a mark-up to the coupon rate for the coupon scale down option. The premium for these two call options are calculated using historical spread premiums.

Table Descriptions

Tables 1, 3 and 4: Shows the steps involved to arrive at the BPA borrowing rate.

Table 2: Shows the difference between the BPA borrowing rate - callable at par between last year and this year.

Table 5: Forecasts a rate equivalent to the Treasury yield curve.

Table 6: Forecasts the rate at which Bonneville would borrow from the U.S. Treasury for a bullet bond with no call option.

Table 7: Forecasts the rate at which Bonneville would borrow from the U.S. Treasury for a bullet bond with a callable at par call option.

Table 8: Forecasts the rate at which Bonneville would borrow from the U.S. Treasury for a bullet bond with a coupon scale-down call option.

Table 9: Forecasts the rate at which Bonneville would back third-party bonds on a taxable basis, as with the Lease Financing Program.

Table 10: Forecasts the rate at which Bonneville would back third-party bonds on a tax-exempt basis, as with Bonneville-backed Energy Northwest bonds.

Table 11: Forecasts the Prime rate, the rate at which banks charge interest for their most creditworthy customers.

Table 12: Forecasts the 3-month LIBOR rate, the rate charged by London banks, used as a benchmark rate worldwide.

Table 13: Forecasts the projected change in the Gross Domestic Product (GDP) price deflator and compares to the FY 2013 inflation forecast. The table also forecasts future inflation rates.

Inflation Forecast

BPA inflation assumptions reflect projected changes in the U.S. GDP Price Deflator. The GDP Price Deflator is the broadest measure of inflation in the U.S. economy. GDP reflects the value of all goods and services produced by domestic and foreign capital and labor within the United States. Major components of GDP include: total consumption, investment, government purchases, and net exports. The real GDP calculations reflect both the changing mix of the components in GDP and the relative price changes in these components.

This index assumes a base year of 2009. The projected change in the GDP price deflator and comparison with the FY 2013 inflation forecast is summarized in Table 13. Column A shows the projected trend in GDP inflation rates between 2014-2043 on a calendar year basis and in column B by BPA fiscal year. Column C provides the cumulative price

index projections. The forecast expresses fiscal year dollar values as mid-year dollar values.

If you have questions, or suggestions concerning the FY 2014 Interest Rate and Inflation Forecasts, please contact Anna-Lisa Miller at (503) 230-4243.



Anna-Lisa Miller
Financial Analyst, Debt and Investment Management
Attachment

cc:

See Front List

Official File –

<http://internal.bpa.gov/finance/FT/FTC/Common%20Agency%20Assumptions/Forms/AllItems.aspx>

Table 1
30 Year Treasury Yields and BPA Borrowing Rates
 FY 2014 Forecast of BPA Borrowing Rates

Calendar/Fiscal Years 2014-2043

Year	A	B	C	D	E
	Bond Rate 1/ <u>Calendar Year</u>	Bond Rate <u>Fiscal Year</u>	BPA Rate 2/ No Premium <u>Fiscal Year</u>	BPA Rate 3/ Coupon Scale-Down <u>Fiscal Year</u>	BPA Rate 4/ Callable at Par <u>Fiscal Year</u>
2013	3.22				
2014	3.91	3.74	4.40	5.60	5.80
2015	4.17	4.11	4.73	5.93	6.13
2016	4.59	4.49	5.07	6.27	6.47
2017	4.75	4.71	5.25	6.45	6.65
2018	4.77	4.76	5.26	6.46	6.66
2019	4.77	4.77	5.27	6.47	6.67
2020	4.77	4.77	5.27	6.47	6.67
2021	4.77	4.77	5.27	6.47	6.67
2022	4.77	4.77	5.27	6.47	6.67
2023	4.77	4.77	5.27	6.47	6.67
2024	4.77	4.77	5.27	6.47	6.67
2025	4.77	4.77	5.27	6.47	6.67
2026	4.77	4.77	5.27	6.47	6.67
2027	4.77	4.77	5.27	6.47	6.67
2028	4.77	4.77	5.27	6.47	6.67
2029	4.77	4.77	5.27	6.47	6.67
2030	4.77	4.77	5.27	6.47	6.67
2031	4.77	4.77	5.27	6.47	6.67
2032	4.77	4.77	5.27	6.47	6.67
2033	4.77	4.77	5.27	6.47	6.67
2034	4.77	4.77	5.27	6.47	6.67
2035	4.77	4.77	5.27	6.47	6.67
2036	4.77	4.77	5.27	6.47	6.67
2037	4.77	4.77	5.27	6.47	6.67
2038	4.77	4.77	5.27	6.47	6.67
2039	4.77	4.77	5.27	6.47	6.67
2040	4.77	4.77	5.27	6.47	6.67
2041	4.77	4.77	5.27	6.47	6.67
2042	4.77	4.77	5.27	6.47	6.67
2043	4.77	4.77	5.27	6.47	6.67

1/ Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

2/ Column C = Column B + U.S. Treasury borrowing markup, no premium

3/ Column D = Column B + U.S. Treasury borrowing markup + Coupon Scale-Down premium

4/ Column E = Column B + U.S. Treasury borrowing markup + Callable at Par premium

Table 2
Forecast Comparison - 30 Year BPA Borrowing Rate - Callable at Par
 BPA FY 2014 vs. BPA FY 2013

Calendar/Fiscal Years 2014-2043

Year	A FY 2014 Forecast BPA Rate 1/ <u>Callable at Par</u>	B FY 2013 Forecast BPA Rate 2/ <u>Callable at Par</u>	C Difference <u>(A-B)</u>
2014	5.80	5.76	0.04
2015	6.13	6.11	0.02
2016	6.47	6.37	0.10
2017	6.65	6.40	0.25
2018	6.66	6.43	0.23
2019	6.67	6.43	0.24
2020	6.67	6.43	0.24
2021	6.67	6.43	0.24
2022	6.67	6.43	0.24
2023	6.67	6.43	0.24
2024	6.67	6.43	0.24
2025	6.67	6.43	0.24
2026	6.67	6.43	0.24
2027	6.67	6.43	0.24
2028	6.67	6.43	0.24
2029	6.67	6.43	0.24
2030	6.67	6.43	0.24
2031	6.67	6.43	0.24
2032	6.67	6.43	0.24
2033	6.67	6.43	0.24
2034	6.67	6.43	0.24
2035	6.67	6.43	0.24
2036	6.67	6.43	0.24
2037	6.67	6.43	0.24
2038	6.67	6.43	0.24
2039	6.67	6.43	0.24
2040	6.67	6.43	0.24
2041	6.67	6.43	0.24
2042	6.67	6.43	0.24
2043	6.67	6.43	0.24

1/ Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

2/ Global Insight The U.S. Economy: 30-year Focus, September 2012 Forecast, Base Case.

Table 3
20 Year Treasury Yields and BPA Borrowing Rates
 FY 2014 Forecast of BPA Borrowing Rates

Calendar/Fiscal Years 2014-2043

Year	A	B	C	D	E
	Bond Rate 1/ <u>Calendar Year</u>	Bond Rate <u>Fiscal Year</u>	BPA Rate 2/ No Premium <u>Fiscal Year</u>	BPA Rate 3/ Coupon Scale-Down <u>Fiscal Year</u>	BPA Rate 4/ Callable at Par <u>Fiscal Year</u>
2013	2.69				
2014	3.41	3.23	3.75	4.78	4.98
2015	3.70	3.63	4.13	5.16	5.36
2016	4.20	4.08	4.57	5.60	5.80
2017	4.62	4.51	5.00	6.03	6.23
2018	4.68	4.67	5.14	6.17	6.37
2019	4.68	4.68	5.16	6.19	6.39
2020	4.68	4.68	5.16	6.19	6.39
2021	4.68	4.68	5.16	6.19	6.39
2022	4.68	4.68	5.16	6.19	6.39
2023	4.68	4.68	5.16	6.19	6.39
2024	4.68	4.68	5.16	6.19	6.39
2025	4.68	4.68	5.16	6.19	6.39
2026	4.68	4.68	5.16	6.19	6.39
2027	4.68	4.68	5.16	6.19	6.39
2028	4.68	4.68	5.16	6.19	6.39
2029	4.68	4.68	5.16	6.19	6.39
2030	4.68	4.68	5.16	6.19	6.39
2031	4.68	4.68	5.16	6.19	6.39
2032	4.68	4.68	5.16	6.19	6.39
2033	4.68	4.68	5.16	6.19	6.39
2034	4.68	4.68	5.16	6.19	6.39
2035	4.68	4.68	5.16	6.19	6.39
2036	4.68	4.68	5.16	6.19	6.39
2037	4.68	4.68	5.16	6.19	6.39
2038	4.68	4.68	5.16	6.19	6.39
2039	4.68	4.68	5.16	6.19	6.39
2040	4.68	4.68	5.16	6.19	6.39
2041	4.68	4.68	5.16	6.19	6.39
2042	4.68	4.68	5.16	6.19	6.39
2043	4.68	4.68	5.16	6.19	6.39

1/ Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

2/ Column C = Column B + U.S. Treasury borrowing markup, no premium

3/ Column D = Column B + U.S. Treasury borrowing markup + Coupon Scale-Down premium

4/ Column E = Column B + U.S. Treasury borrowing markup + Callable at Par premium

Table 4
15 Year Treasury Yields and BPA Borrowing Rates
 FY 2014 Forecast of BPA Borrowing Rates

Calendar/Fiscal Years 2014-2043

Year	A	B	C	D	E
	Bond Rate 1/ <u>Calendar Year</u>	Bond Rate <u>Fiscal Year</u>	BPA Rate 2/ No Premium <u>Fiscal Year</u>	BPA Rate 3/ Coupon Scale-Down <u>Fiscal Year</u>	BPA Rate 4/ Callable at Par <u>Fiscal Year</u>
2013	2.42				
2014	3.16	2.98	3.42	4.36	4.56
2015	3.46	3.39	3.84	4.78	4.98
2016	4.01	3.87	4.32	5.27	5.47
2017	4.55	4.41	4.87	5.82	6.02
2018	4.64	4.62	5.08	6.02	6.22
2019	4.64	4.64	5.10	6.05	6.25
2020	4.64	4.64	5.10	6.05	6.25
2021	4.64	4.64	5.10	6.05	6.25
2022	4.64	4.64	5.10	6.05	6.25
2023	4.64	4.64	5.10	6.05	6.25
2024	4.64	4.64	5.10	6.05	6.25
2025	4.64	4.64	5.10	6.05	6.25
2026	4.64	4.64	5.10	6.05	6.25
2027	4.64	4.64	5.10	6.05	6.25
2028	4.64	4.64	5.10	6.05	6.25
2029	4.64	4.64	5.10	6.05	6.25
2030	4.64	4.64	5.10	6.05	6.25
2031	4.64	4.64	5.10	6.05	6.25
2032	4.64	4.64	5.10	6.05	6.25
2033	4.64	4.64	5.10	6.05	6.25
2034	4.64	4.64	5.10	6.05	6.25
2035	4.64	4.64	5.10	6.05	6.25
2036	4.64	4.64	5.10	6.05	6.25
2037	4.64	4.64	5.10	6.05	6.25
2038	4.64	4.64	5.10	6.05	6.25
2039	4.64	4.64	5.10	6.05	6.25
2040	4.64	4.64	5.10	6.05	6.25
2041	4.64	4.64	5.10	6.05	6.25
2042	4.64	4.64	5.10	6.05	6.25
2043	4.64	4.64	5.10	6.05	6.25

1/ Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

2/ Column C = Column B + U.S. Treasury borrowing markup, no premium

3/ Column D = Column B + U.S. Treasury borrowing markup + Coupon Scale-Down premium

4/ Column E = Column B + U.S. Treasury borrowing markup + Callable at Par premium

Table 5
BPA FY 2014 Appropriation Borrowing Rate Forecast 1/

Fiscal Years 2014-2043
(continued on next page)

<u>Year</u>	<u>Maturity</u>														
	<u>1 Year</u>	<u>2 Year</u>	<u>3 Year</u>	<u>4 Year</u>	<u>5 Year</u>	<u>6 Year</u>	<u>7 Year</u>	<u>8 Year</u>	<u>9 Year</u>	<u>10 Year</u>	<u>11 Year</u>	<u>12 Year</u>	<u>13 Year</u>	<u>14 Year</u>	<u>15 Year</u>
2014 2/	0.24	0.53	1.01	1.44	1.74	1.85	2.40	2.61	2.80	2.92	3.02	3.13	3.23	3.28	3.38
2015	0.53	0.82	1.16	1.51	1.86	2.12	2.38	2.63	2.89	3.15	3.20	3.24	3.29	3.34	3.39
2016	2.10	2.37	2.54	2.71	2.88	3.03	3.19	3.35	3.51	3.67	3.71	3.75	3.79	3.83	3.87
2017	3.56	3.76	3.85	3.94	4.03	4.09	4.15	4.20	4.26	4.32	4.34	4.36	4.38	4.40	4.41
2018	3.93	4.14	4.22	4.30	4.38	4.42	4.46	4.49	4.53	4.57	4.58	4.59	4.60	4.61	4.62
2019	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2020	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2021	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2022	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2023	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2024	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2025	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2026	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2027	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2028	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2029	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2030	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2031	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2032	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2033	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2034	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2035	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2036	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2037	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2038	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2039	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2040	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2041	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2042	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64
2043	3.95	4.17	4.25	4.33	4.40	4.44	4.48	4.52	4.56	4.60	4.61	4.62	4.62	4.63	4.64

1\Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

2\ FY 2014 Appropriation rates are determined in accordance with BPA Appropriations Refinancing Act, 16 U.S.C. 8381 enacted on April 26, 1996, and are independent of the Global Insight Treasury Yield forecasts.

Table 5
BPA FY 2014 Appropriation Borrowing Rate Forecast 1/

Fiscal Years 2014-2043

Maturity

<u>16 Year</u>	<u>17 Year</u>	<u>18 Year</u>	<u>19 Year</u>	<u>20 Year</u>	<u>21 Year</u>	<u>22 Year</u>	<u>23 Year</u>	<u>24 Year</u>	<u>25 Year</u>	<u>26 Year</u>	<u>27 Year</u>	<u>28 Year</u>	<u>29 Year</u>	<u>30 Year</u>	<u>50 Year</u>	<u>Year</u>
3.44	3.50	3.50	3.58	3.63	3.63	3.63	3.74	3.75	3.75	3.75	3.75	3.88	3.88	3.88	3.88	2014 2/
3.44	3.48	3.53	3.58	3.63	3.68	3.72	3.77	3.82	3.87	3.92	3.97	4.01	4.06	4.11	4.11	2015
3.91	3.95	4.00	4.04	4.08	4.12	4.16	4.20	4.24	4.28	4.32	4.36	4.41	4.45	4.49	4.49	2016
4.43	4.45	4.47	4.49	4.51	4.53	4.55	4.57	4.59	4.61	4.63	4.65	4.67	4.69	4.71	4.71	2017
4.63	4.64	4.65	4.66	4.67	4.68	4.69	4.69	4.70	4.71	4.72	4.73	4.74	4.75	4.76	4.76	2018
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2019
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2020
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2021
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2022
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2023
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2024
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2025
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2026
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2027
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2028
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2029
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2030
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2031
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2032
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2033
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2034
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2035
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2036
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2037
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2038
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2039
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2040
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2041
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2042
4.65	4.66	4.67	4.67	4.68	4.69	4.70	4.71	4.72	4.72	4.73	4.74	4.75	4.76	4.77	4.77	2043

1/Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

2/ FY 2014 Appropriation rates are determined in accordance with BPA Appropriations Refinancing Act, 16 U.S.C. 8381 enacted on April 26, 1996, and are independent of the Global Insight Treasury Yield forecasts.

Table 6
BPA FY 2014 BPA Borrowing Rate - No Premium 1/

Fiscal Years 2014-2043
 (continued on next page)

<u>Maturity</u>															
<u>Year</u>	<u>1 Year</u>	<u>2 Year</u>	<u>3 Year</u>	<u>4 Year</u>	<u>5 Year</u>	<u>6 Year</u>	<u>7 Year</u>	<u>8 Year</u>	<u>9 Year</u>	<u>10 Year</u>	<u>11 Year</u>	<u>12 Year</u>	<u>13 Year</u>	<u>14 Year</u>	<u>15 Year</u>
2014	0.30	0.57	1.02	1.47	1.93	2.16	2.39	2.63	2.86	3.09	3.16	3.22	3.29	3.35	3.42
2015	0.67	1.01	1.44	1.86	2.28	2.53	2.78	3.03	3.29	3.54	3.60	3.66	3.72	3.78	3.84
2016	2.29	2.61	2.85	3.09	3.32	3.47	3.62	3.77	3.93	4.08	4.13	4.18	4.23	4.27	4.32
2017	3.77	4.04	4.19	4.35	4.51	4.55	4.60	4.65	4.70	4.75	4.77	4.80	4.82	4.85	4.87
2018	4.17	4.46	4.60	4.74	4.88	4.91	4.94	4.96	4.99	5.02	5.03	5.04	5.05	5.07	5.08
2019	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2020	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2021	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2022	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2023	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2024	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2025	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2026	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2027	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2028	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2029	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2030	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2031	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2032	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2033	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2034	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2035	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2036	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2037	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2038	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2039	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2040	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2041	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2042	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10
2043	4.19	4.49	4.63	4.77	4.90	4.93	4.96	4.99	5.02	5.05	5.06	5.07	5.08	5.09	5.10

1\Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 6
 BPA FY 2014 BPA Borrowing Rate - No Premium 1/

Fiscal Years 2014-2043

Maturity

<u>16 Year</u>	<u>17 Year</u>	<u>18 Year</u>	<u>19 Year</u>	<u>20 Year</u>	<u>21 Year</u>	<u>22 Year</u>	<u>23 Year</u>	<u>24 Year</u>	<u>25 Year</u>	<u>26 Year</u>	<u>27 Year</u>	<u>28 Year</u>	<u>29 Year</u>	<u>30 Year</u>	<u>50 Year</u>	<u>Year</u>
3.48	3.55	3.61	3.68	3.75	3.81	3.88	3.94	4.01	4.07	4.14	4.20	4.27	4.33	4.40	4.40	2014
3.90	3.95	4.01	4.07	4.13	4.19	4.25	4.31	4.37	4.43	4.49	4.55	4.61	4.67	4.73	4.73	2015
4.37	4.42	4.47	4.52	4.57	4.62	4.67	4.72	4.77	4.82	4.87	4.92	4.97	5.02	5.07	5.07	2016
4.90	4.92	4.95	4.97	5.00	5.02	5.05	5.07	5.10	5.12	5.15	5.17	5.20	5.22	5.25	5.25	2017
5.09	5.10	5.12	5.13	5.14	5.15	5.16	5.18	5.19	5.20	5.21	5.23	5.24	5.25	5.26	5.26	2018
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2019
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2020
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2021
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2022
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2023
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2024
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2025
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2026
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2027
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2028
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2029
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2030
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2031
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2032
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2033
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2034
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2035
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2036
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2037
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2038
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2039
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2040
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2041
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2042
5.11	5.12	5.13	5.15	5.16	5.17	5.18	5.19	5.20	5.21	5.22	5.23	5.24	5.26	5.27	5.27	2043

1\Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 7
BPA FY 2014 BPA Borrowing Rate - Coupon Scale-Down Redemption Premium 1/

Fiscal Years 2014-2043
 (continued on next page)

<u>Year</u>	<u>Maturity</u>														
	<u>1 Year</u>	<u>2 Year</u>	<u>3 Year</u>	<u>4 Year</u>	<u>5 Year</u>	<u>6 Year</u>	<u>7 Year</u>	<u>8 Year</u>	<u>9 Year</u>	<u>10 Year</u>	<u>11 Year</u>	<u>12 Year</u>	<u>13 Year</u>	<u>14 Year</u>	<u>15 Year</u>
2014	0.38	0.74	1.28	1.82	2.36	2.68	2.99	3.31	3.63	3.95	4.03	4.12	4.20	4.28	4.36
2015	0.76	1.18	1.69	2.20	2.71	3.05	3.38	3.72	4.06	4.40	4.47	4.55	4.63	4.70	4.78
2016	2.37	2.78	3.11	3.43	3.75	3.99	4.23	4.46	4.70	4.94	5.00	5.07	5.14	5.20	5.27
2017	3.86	4.21	4.45	4.69	4.94	5.07	5.20	5.34	5.47	5.61	5.65	5.69	5.73	5.77	5.82
2018	4.26	4.64	4.86	5.09	5.31	5.42	5.54	5.65	5.76	5.88	5.91	5.94	5.97	5.99	6.02
2019	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2020	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2021	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2022	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2023	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2024	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2025	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2026	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2027	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2028	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2029	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2030	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2031	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2032	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2033	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2034	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2035	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2036	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2037	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2038	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2039	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2040	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2041	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2042	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05
2043	4.28	4.66	4.89	5.11	5.33	5.45	5.56	5.68	5.79	5.91	5.93	5.96	5.99	6.02	6.05

1\Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 7
 BPA FY 2014 BPA Borrowing Rate - Coupon Scale-Down Redemption Premium 1/

Fiscal Years 2014-2043

Maturity

<u>16 Year</u>	<u>17 Year</u>	<u>18 Year</u>	<u>19 Year</u>	<u>20 Year</u>	<u>21 Year</u>	<u>22 Year</u>	<u>23 Year</u>	<u>24 Year</u>	<u>25 Year</u>	<u>26 Year</u>	<u>27 Year</u>	<u>28 Year</u>	<u>29 Year</u>	<u>30 Year</u>	<u>50 Year</u>	<u>Year</u>
4.45	4.53	4.61	4.69	4.78	4.86	4.94	5.02	5.10	5.19	5.27	5.35	5.43	5.52	5.60	5.60	2014
4.86	4.93	5.01	5.09	5.16	5.24	5.32	5.39	5.47	5.55	5.62	5.70	5.78	5.85	5.93	5.93	2015
5.34	5.40	5.47	5.54	5.60	5.67	5.73	5.80	5.87	5.93	6.00	6.07	6.13	6.20	6.27	6.27	2016
5.86	5.90	5.94	5.98	6.03	6.07	6.11	6.15	6.20	6.24	6.28	6.32	6.36	6.41	6.45	6.45	2017
6.05	6.08	6.11	6.14	6.17	6.20	6.23	6.26	6.29	6.32	6.35	6.37	6.40	6.43	6.46	6.46	2018
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2019
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2020
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2021
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2022
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2023
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2024
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2025
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2026
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2027
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2028
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2029
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2030
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2031
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2032
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2033
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2034
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2035
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2036
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2037
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2038
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2039
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2040
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2041
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2042
6.07	6.10	6.13	6.16	6.19	6.21	6.24	6.27	6.30	6.33	6.35	6.38	6.41	6.44	6.47	6.47	2043

1|Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 8
 BPA FY 2014 BPA Borrowing Rate - Callable at Par 1/

Fiscal Years 2014-2043
 (continued on next page)

<u>Maturity</u>															
<u>Year</u>	<u>1 Year</u>	<u>2 Year</u>	<u>3 Year</u>	<u>4 Year</u>	<u>5 Year</u>	<u>6 Year</u>	<u>7 Year</u>	<u>8 Year</u>	<u>9 Year</u>	<u>10 Year</u>	<u>11 Year</u>	<u>12 Year</u>	<u>13 Year</u>	<u>14 Year</u>	<u>15 Year</u>
2014	0.40	0.78	1.34	1.90	2.46	2.80	3.13	3.47	3.81	4.15	4.23	4.32	4.40	4.48	4.56
2015	0.78	1.22	1.75	2.28	2.81	3.17	3.52	3.88	4.24	4.60	4.67	4.75	4.83	4.90	4.98
2016	2.39	2.82	3.17	3.51	3.85	4.11	4.37	4.62	4.88	5.14	5.20	5.27	5.34	5.40	5.47
2017	3.88	4.25	4.51	4.77	5.04	5.19	5.34	5.50	5.65	5.81	5.85	5.89	5.93	5.97	6.02
2018	4.28	4.68	4.92	5.17	5.41	5.54	5.68	5.81	5.94	6.08	6.11	6.14	6.17	6.19	6.22
2019	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2020	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2021	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2022	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2023	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2024	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2025	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2026	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2027	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2028	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2029	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2030	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2031	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2032	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2033	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2034	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2035	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2036	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2037	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2038	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2039	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2040	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2041	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2042	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25
2043	4.30	4.70	4.95	5.19	5.43	5.57	5.70	5.84	5.97	6.11	6.13	6.16	6.19	6.22	6.25

1\Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 8
 BPA FY 2014 BPA Borrowing Rate - Callable at Par 1/

Fiscal Years 2014-2043

Maturity

<u>16 Year</u>	<u>17 Year</u>	<u>18 Year</u>	<u>19 Year</u>	<u>20 Year</u>	<u>21 Year</u>	<u>22 Year</u>	<u>23 Year</u>	<u>24 Year</u>	<u>25 Year</u>	<u>26 Year</u>	<u>27 Year</u>	<u>28 Year</u>	<u>29 Year</u>	<u>30 Year</u>	<u>50 Year</u>	<u>Year</u>
4.65	4.73	4.81	4.89	4.98	5.06	5.14	5.22	5.30	5.39	5.47	5.55	5.63	5.72	5.80	5.80	2014
5.06	5.13	5.21	5.29	5.36	5.44	5.52	5.59	5.67	5.75	5.82	5.90	5.98	6.05	6.13	6.13	2015
5.54	5.60	5.67	5.74	5.80	5.87	5.93	6.00	6.07	6.13	6.20	6.27	6.33	6.40	6.47	6.47	2016
6.06	6.10	6.14	6.18	6.23	6.27	6.31	6.35	6.40	6.44	6.48	6.52	6.56	6.61	6.65	6.65	2017
6.25	6.28	6.31	6.34	6.37	6.40	6.43	6.46	6.49	6.52	6.55	6.57	6.60	6.63	6.66	6.66	2018
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2019
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2020
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2021
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2022
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2023
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2024
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2025
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2026
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2027
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2028
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2029
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2030
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2031
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2032
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2033
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2034
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2035
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2036
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2037
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2038
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2039
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2040
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2041
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2042
6.27	6.30	6.33	6.36	6.39	6.41	6.44	6.47	6.50	6.53	6.55	6.58	6.61	6.64	6.67	6.67	2043

1/Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 9

BPA FY 2014 Third-Party Taxable Borrowing Rate Forecast 1/

Fiscal Years 2014-2043
(continued on next page)

Maturity

<u>Year</u>	<u>1 Year</u>	<u>2 Year</u>	<u>3 Year</u>	<u>4 Year</u>	<u>5 Year</u>	<u>6 Year</u>	<u>7 Year</u>	<u>8 Year</u>	<u>9 Year</u>	<u>10 Year</u>	<u>11 Year</u>	<u>12 Year</u>	<u>13 Year</u>	<u>14 Year</u>	<u>15 Year</u>
2014	1.04	1.11	1.49	1.88	2.27	2.58	2.89	3.20	3.52	3.83	3.91	4.00	4.08	4.16	4.25
2015	1.31	1.45	1.88	2.30	2.72	3.06	3.40	3.74	4.08	4.41	4.48	4.54	4.60	4.66	4.73
2016	2.57	3.36	3.60	3.85	4.10	4.30	4.50	4.71	4.91	5.11	5.16	5.20	5.25	5.29	5.34
2017	4.01	4.37	4.53	4.68	4.84	4.93	5.01	5.10	5.19	5.28	5.33	5.38	5.43	5.48	5.53
2018	4.41	4.59	4.73	4.88	5.02	5.09	5.16	5.23	5.30	5.36	5.41	5.47	5.52	5.57	5.62
2019	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2020	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2021	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2022	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2023	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2024	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2025	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2026	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2027	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2028	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2029	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2030	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2031	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2032	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2033	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2034	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2035	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2036	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2037	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2038	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2039	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2040	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2041	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2042	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64
2043	4.43	4.62	4.76	4.90	5.04	5.11	5.19	5.26	5.33	5.40	5.45	5.50	5.54	5.59	5.64

1/Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 9

BPA FY 2014 Third-Party Taxable Borrowing Rate Forecast 1/

Fiscal Years 2014-2043

Maturity

<u>16 Year</u>	<u>17 Year</u>	<u>18 Year</u>	<u>19 Year</u>	<u>20 Year</u>	<u>21 Year</u>	<u>22 Year</u>	<u>23 Year</u>	<u>24 Year</u>	<u>25 Year</u>	<u>26 Year</u>	<u>27 Year</u>	<u>28 Year</u>	<u>29 Year</u>	<u>30 Year</u>	<u>50 Year</u>	<u>Year</u>
4.33	4.42	4.50	4.59	4.67	4.76	4.84	4.92	5.01	5.09	5.18	5.26	5.35	5.43	5.52	5.52	2014
4.79	4.85	4.91	4.98	5.04	5.10	5.16	5.23	5.29	5.35	5.41	5.48	5.54	5.60	5.66	5.66	2015
5.38	5.43	5.47	5.52	5.56	5.61	5.66	5.70	5.75	5.79	5.84	5.88	5.93	5.97	6.02	6.02	2016
5.59	5.64	5.69	5.74	5.79	5.84	5.89	5.95	6.00	6.05	6.10	6.15	6.20	6.25	6.31	6.31	2017
5.67	5.72	5.77	5.82	5.87	5.92	5.97	6.02	6.07	6.12	6.17	6.22	6.27	6.33	6.38	6.38	2018
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2019
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2020
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2021
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2022
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2023
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2024
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2025
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2026
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2027
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2028
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2029
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2030
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2031
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2032
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2033
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2034
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2035
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2036
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2037
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2038
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2039
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2040
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2041
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2042
5.69	5.74	5.79	5.84	5.89	5.94	5.99	6.04	6.09	6.14	6.19	6.23	6.28	6.33	6.38	6.38	2043

1/Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 10
 BPA FY 2014 Third-Party Tax-Exempt Borrowing Rate Forecast 1/

Fiscal Years 2014-2043
 (continued on next page)

Maturity

<u>Year</u>	<u>1 Year</u>	<u>2 Year</u>	<u>3 Year</u>	<u>4 Year</u>	<u>5 Year</u>	<u>6 Year</u>	<u>7 Year</u>	<u>8 Year</u>	<u>9 Year</u>	<u>10 Year</u>	<u>11 Year</u>	<u>12 Year</u>	<u>13 Year</u>	<u>14 Year</u>	<u>15 Year</u>
2014	0.35	0.55	0.88	1.21	1.54	1.77	2.01	2.25	2.49	2.73	2.78	2.84	2.89	2.95	3.00
2015	0.65	0.89	1.20	1.51	1.82	2.08	2.34	2.60	2.87	3.13	3.18	3.23	3.28	3.33	3.38
2016	1.99	2.22	2.38	2.54	2.70	2.88	3.07	3.25	3.43	3.61	3.66	3.70	3.75	3.79	3.84
2017	2.76	2.94	3.05	3.17	3.29	3.39	3.48	3.58	3.68	3.78	3.83	3.87	3.92	3.97	4.02
2018	2.91	3.10	3.21	3.33	3.44	3.52	3.61	3.69	3.77	3.86	3.90	3.95	4.00	4.04	4.09
2019	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2020	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2021	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2022	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2023	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2024	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2025	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2026	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2027	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2028	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2029	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2030	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2031	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2032	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2033	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2034	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2035	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2036	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2037	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2038	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2039	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2040	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2041	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2042	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11
2043	2.92	3.12	3.23	3.34	3.46	3.54	3.63	3.71	3.79	3.88	3.92	3.97	4.02	4.06	4.11

1\Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 10
 BPA FY 2014 Third-Party Tax-Exempt Borrowing Rate Forecast 1/

Fiscal Years 2014-2043

<u>Maturity</u>																
<u>16 Year</u>	<u>17 Year</u>	<u>18 Year</u>	<u>19 Year</u>	<u>20 Year</u>	<u>21 Year</u>	<u>22 Year</u>	<u>23 Year</u>	<u>24 Year</u>	<u>25 Year</u>	<u>26 Year</u>	<u>27 Year</u>	<u>28 Year</u>	<u>29 Year</u>	<u>30 Year</u>	<u>50 Year</u>	<u>Year</u>
3.06	3.11	3.17	3.22	3.28	3.33	3.39	3.44	3.50	3.55	3.61	3.66	3.72	3.77	3.83	3.83	2014
3.44	3.49	3.54	3.59	3.64	3.69	3.74	3.79	3.85	3.90	3.95	4.00	4.05	4.10	4.15	4.15	2015
3.88	3.93	3.97	4.02	4.06	4.11	4.15	4.20	4.25	4.29	4.34	4.38	4.43	4.47	4.52	4.52	2016
4.06	4.11	4.16	4.21	4.25	4.30	4.35	4.40	4.44	4.49	4.54	4.59	4.63	4.68	4.73	4.73	2017
4.13	4.18	4.23	4.27	4.32	4.37	4.41	4.46	4.50	4.55	4.60	4.64	4.69	4.74	4.78	4.78	2018
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2019
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2020
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2021
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2022
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2023
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2024
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2025
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2026
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2027
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2028
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2029
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2030
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2031
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2032
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2033
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2034
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2035
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2036
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2037
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2038
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2039
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2040
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2041
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2042
4.15	4.20	4.24	4.29	4.33	4.38	4.42	4.47	4.51	4.56	4.61	4.65	4.70	4.74	4.79	4.79	2043

1\Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 11
BPA FY 2014 FERC Borrowing Rate (Bank Prime) Forecast 1/

Calendar/Fiscal Years 2014-2043

<u>Year</u>	<u>A</u> FERC Rate <u>Calendar Year</u>	<u>B</u> FERC Rate <u>Fiscal Year</u>
2014	3.25	3.25
2015	3.42	3.38
2016	5.15	4.72
2017	6.83	6.41
2018	7.00	6.96
2019	7.00	7.00
2020	7.00	7.00
2021	7.00	7.00
2022	7.00	7.00
2023	7.00	7.00
2024	7.00	7.00
2025	7.00	7.00
2026	7.00	7.00
2027	7.00	7.00
2028	7.00	7.00
2029	7.00	7.00
2030	7.00	7.00
2031	7.00	7.00
2032	7.00	7.00
2033	7.00	7.00
2034	7.00	7.00
2035	7.00	7.00
2036	7.00	7.00
2037	7.00	7.00
2038	7.00	7.00
2039	7.00	7.00
2040	7.00	7.00
2041	7.00	7.00
2042	7.00	7.00
2043	7.00	7.00

1/ Global Insight: The U.S. Economy: 30-Year Focus, September 2013
Forecast, Base Case.

Table 12
BPA FY 2014 May 3-Month LIBOR Rate Forecast 1/

Calendar/Fiscal Years 2014-2043

<u>Year</u>	A 3-Mo LIBOR <u>Calendar Year</u>	B 3-Mo LIBOR <u>Fiscal Year</u>
2014	0.28	0.32
2015	0.62	0.54
2016	2.46	2.00
2017	4.10	3.69
2018	4.25	4.21
2019	4.25	4.25
2020	4.25	4.25
2021	4.25	4.25
2022	4.25	4.25
2023	4.25	4.25
2024	4.25	4.25
2025	4.25	4.25
2026	4.25	4.25
2027	4.25	4.25
2028	4.25	4.25
2029	4.25	4.25
2030	4.25	4.25
2031	4.25	4.25
2032	4.25	4.25
2033	4.25	4.25
2034	4.25	4.25
2035	4.25	4.25
2036	4.25	4.25
2037	4.25	4.25
2038	4.25	4.25
2039	4.25	4.25
2040	4.25	4.25
2041	4.25	4.25
2042	4.25	4.25
2043	4.25	4.25

1/ Global Insight: The U.S. Economy: 30-Year Focus, September 2013 Forecast, Base Case.

Table 13
Comparison of FY 2014 Inflation Forecast Components
 Calendar/Fiscal Year Forecasts 2014 vs. 2013

Calendar/Fiscal Years 2014-2043							
	A	B	C	D	E	F	G
	CY 2014 1/ Calendar Year	FY 2014 1/ Fiscal Year	FY 2014 2/ Fiscal Year	FY 2013 1/ Fiscal Year	FY 2013 1/ Fiscal Year	Change in the FY Price Deflator	Change in the FY Cumulative Price Deflator
YEAR	GDP Price Deflator (%)	GDP Price Deflator (%)	Cumulative Price Deflator (Base Year 2013)	FY Price Deflator (%)	FY Cumulative Price Deflator (Base Year 2012)	(B-D)	(C-E)
2014	1.79%	1.70%	1.008	1.60%	1.027	0.10%	-0.020
2015	1.59%	1.64%	1.025	1.59%	1.044	0.05%	-0.019
2016	1.68%	1.66%	1.041	1.64%	1.060	0.01%	-0.019
2017	1.60%	1.62%	1.059	1.61%	1.078	0.01%	-0.019
2018	1.60%	1.60%	1.076	1.66%	1.095	-0.06%	-0.019
2019	1.56%	1.57%	1.093	1.64%	1.113	-0.08%	-0.020
2020	1.65%	1.63%	1.110	1.66%	1.132	-0.03%	-0.021
2021	1.71%	1.69%	1.128	1.70%	1.150	-0.01%	-0.022
2022	1.71%	1.71%	1.147	1.74%	1.170	-0.03%	-0.023
2023	1.73%	1.72%	1.167	1.74%	1.190	-0.02%	-0.023
2024	1.72%	1.72%	1.187	1.72%	1.211	0.01%	-0.024
2025	1.75%	1.74%	1.208	1.71%	1.232	0.03%	-0.024
2026	1.81%	1.79%	1.229	1.72%	1.253	0.07%	-0.024
2027	1.85%	1.84%	1.251	1.73%	1.274	0.11%	-0.024
2028	1.84%	1.84%	1.274	1.74%	1.296	0.10%	-0.023
2029	1.86%	1.85%	1.297	1.78%	1.319	0.07%	-0.022
2030	1.86%	1.86%	1.321	1.80%	1.343	0.05%	-0.022
2031	1.93%	1.91%	1.346	1.84%	1.367	0.07%	-0.021
2032	1.93%	1.93%	1.371	1.83%	1.392	0.10%	-0.021
2033	1.97%	1.96%	1.398	1.82%	1.417	0.15%	-0.020
2034	2.01%	2.00%	1.425	1.83%	1.443	0.17%	-0.018
2035	1.97%	1.98%	1.454	1.82%	1.469	0.15%	-0.016
2036	1.97%	1.97%	1.482	1.82%	1.496	0.15%	-0.014
2037	2.00%	1.99%	1.511	1.84%	1.523	0.15%	-0.012
2038	2.01%	2.01%	1.542	1.85%	1.551	0.16%	-0.010
2039	2.02%	2.02%	1.573	1.86%	1.580	0.16%	-0.008
2040	2.01%	2.01%	1.604	1.85%	1.609	0.16%	-0.005
2041	2.01%	2.01%	1.637	1.85%	1.639	0.16%	-0.003
2042	2.01%	2.01%	1.670	1.85%	1.670	0.15%	0.000
2043	2.02%	2.01%	1.703				

1/ Global Insight The U.S. Economy. 30-Year Focus, September 2013 Forecast, Base Case.

2/ Fiscal Year Cumulative Price Deflator escalates to midyear dollars. The first year, 2014, is determined as follows: $1.008 = ((1.698/100) \cdot 5) + 1$. An example of subsequent year cumulative growth such as in 2015 is found as: $1.025 = (1 + (1.64/100)) \cdot 1.008$

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7. HISTORICAL AND PROJECTED NEW BONDS ISSUED TO TREASURY

7.1 Purpose

This chapter documents all the bonds that BPA has issued and those it projects it will issue to the U.S. Treasury to finance capital investments.

7.2 Method

New long-term debt consists of bonds issued by BPA to the U.S. Treasury reflecting projected outlays for BPA transmission, construction, and environmental programs during the cost evaluation period (FY 2015–2017). All bonds projected for issuance are entered into the projected portions of the repayment study.

New bonds projected to be issued for the cost evaluation period are based on Integrated Program Review capital program outlays.

	A	B	C	D	E	F
1	Table 7-1: PROJECTED FEDERAL BORROWING FOR FY 2014 - 2017					
2	(\$000s)					
3						
4		A	B	C	D	E
5		FISCAL YEAR	DESCRIPTION	INTEREST RATE	TERM	TOTAL BORROWING
6	1	2014	Environment	1.76%	15	3,000
7	2		Construction	1.76%	8	9,000
8	3		Construction	1.76%	21	42,150
9	4		Construction	3.64%	21	18,740
10	5		Construction	3.60%	21	65,000
11	6		Construction (AS)	1.76%	6	1,950
12	7		Construction (AS)	1.76%	6	2,021
13	8		Construction (AS)	1.76%	6	<u>4,125</u>
14	9		TOTAL			145,986
15	10					
16	11	2015	Environment	3.84%	15	6,000
17	12		Construction	3.60%	11	43,000
18	13		Construction	3.66%	12	25,000
19	14		Construction	3.60%	11	50,000
20	15		Construction	3.54%	10	34,000
21	16		Construction	3.54%	10	40,000
22	17		Construction	3.54%	10	56,000
23	18		Construction	3.54%	10	52,000
24	19		Construction	3.66%	12	59,000
25	20		Construction	3.66%	12	47,000
26	21		Construction	3.78%	14	47,000
27	22		Construction	3.78%	14	65,000
28	23		Construction	3.78%	14	69,000
29	24		Construction (AS)	1.76%	6	1,300
30	25		Construction (AS)	2.53%	6	1,300
31	26		Construction (AS)	2.53%	6	1,300
32	27		Construction (AS)	2.53%	6	650
33	28		Construction (AS)	2.53%	6	1,300
34	29		Construction (AS)	2.53%	6	1,300
35	30		Construction (AS)	2.53%	6	1,300
36	31		Construction (AS)	2.53%	6	1,300
37	32		Construction (AS)	2.53%	6	1,300
38	33		Construction (AS)	2.53%	6	1,300

	A	B	C	D	E	F
1	Table 7-1: PROJECTED FEDERAL BORROWING FOR FY 2014 - 2017					
2	(\$000s)					
3						
4		A	B	C	D	E
5		FISCAL YEAR	DESCRIPTION	INTEREST RATE	TERM	TOTAL BORROWING
39	34		Construction (AS)	2.53%	6	1,300
40	35		Construction (AS)	2.53%	6	<u>2,600</u>
41	36		TOTAL			609,250
42	37					
43	38	2016	Environment	4.32%	15	7,000
44	39		Construction	4.13%	11	42,000
45	40		Construction	4.13%	11	25,000
46	41		Construction	4.13%	11	49,000
47	42		Construction	4.27%	14	33,000
48	43		Construction	4.27%	14	39,000
49	44		Construction	4.27%	14	55,000
50	45		Construction	4.27%	14	51,000
51	46		Construction	4.32%	15	58,000
52	47		Construction	4.32%	15	45,000
53	48		Construction	4.32%	15	46,000
54	49		Construction	4.32%	15	63,000
55	50		Construction	4.32%	15	67,000
56	51		Construction (AS)	3.47%	30	1,300
57	52		Construction (AS)	3.47%	30	1,300
58	53		Construction (AS)	3.47%	30	1,300
59	54		Construction (AS)	3.47%	6	1,300
60	55		Construction (AS)	3.47%	6	1,300
61	56		Construction (AS)	3.47%	6	1,300
62	57		Construction (AS)	3.47%	6	1,300
63	58		Construction (AS)	3.47%	6	1,300
64	59		Construction (AS)	3.47%	6	1,950
65	60		Construction (AS)	3.47%	6	1,300
66	61		Construction (AS)	3.47%	6	1,300
67	62		Construction (AS)	3.47%	6	<u>3,250</u>
68	63		TOTAL			598,200
69	64					
70	65	2017	Environment	4.87%	15	7,000
71	66		Construction	4.87%	15	38,000

	A	B	C	D	E	F
1	Table 7-1: PROJECTED FEDERAL BORROWING FOR FY 2014 - 2017					
2	(\$000s)					
3						
4		A	B	C	D	E
5		FISCAL YEAR	DESCRIPTION	INTEREST RATE	TERM	TOTAL BORROWING
72	67		Construction	4.87%	15	23,000
73	68		Construction	4.87%	15	45,000
74	69		Construction	4.87%	15	30,000
75	70		Construction	4.87%	15	36,000
76	71		Construction	4.87%	15	50,000
77	72		Construction	4.90%	16	46,000
78	73		Construction	4.90%	16	53,000
79	74		Construction	4.75%	10	42,000
80	75		Construction	4.75%	10	42,000
81	76		Construction	5.00%	20	58,000
82	77		Construction	5.00%	20	61,000
83	78		Construction (AS)	4.55%	6	650
84	79		Construction (AS)	4.55%	6	1,300
85	80		Construction (AS)	4.55%	6	650
86	81		Construction (AS)	4.55%	6	650
87	82		Construction (AS)	4.50%	6	1,300
88	83		Construction (AS)	4.55%	6	1,300
89	84		Construction (AS)	4.55%	6	650
90	85		Construction (AS)	4.55%	6	1,300
91	86		Construction (AS)	4.55%	6	1,300
92	87		Construction (AS)	4.55%	6	1,300
93	88		Construction (AS)	4.55%	6	1,300
94	89		Construction (AS)	4.55%	6	2,600
95	90		TOTAL			545,300

8. NON-FEDERAL PAYMENT OBLIGATIONS

8.1 Introduction

There are two forms of non-Federal payment obligations associated with transmission assets in this rate proposal. One is a lease-purchase arrangement for capitalized asset purchases. The other is the functional reassignment to transmission of debt service payment obligations associated with non-Federal, Energy Northwest (EN) bonds.

8.2 Capital Leases

BPA entered into a lease-purchase agreement with the Northwest Infrastructure Financing Corporation (NIFC) to provide for the construction of the 500-kV Schultz-Wautoma transmission line. Since the completion of that project, BPA has entered into additional lease-purchase agreements with other NIFC entities and the Port of Morrow for other capital projects. The resulting payment streams are treated as debt service in the repayment study. BPA also has several legacy capital leases such as those for the Teton-Swan Valley and the Goshen-Drummond lines. Table 8-1 displays the consolidated payment stream.

8.3 Debt Service Reassignment

Debt Service Reassignment (DSR) is an accounting and ratemaking mechanism created to make full use of the Debt Optimization Program (DOP). It allows the use of cash flows generated by DOP actions for advanced amortization payments of transmission debt. In return, DSR ensures that Transmission revenues repay the full cost of the associated EN debt. DOP and DSR ended in FY 2009, but the associated financial obligations exist through FY 2018.

Under DOP, the proceeds from EN refinancing bonds are used to pay principal on the currently maturing EN bonds in a given fiscal year. Since BPA power rates were set to recover the originally expected EN principal payments on the maturing bonds, and the associated debt service requirement was expected to decrease the EN budget (when the principal was paid from the proceeds of the newly issued refinancing bonds), funds in the BPA Fund then became available for other purposes. The amount made available equals the principal of the amortized EN bonds. BPA uses these funds to amortize Federal obligations associated with generation and transmission assets ahead of schedule, thereby replenishing or creating future opportunities to replenish BPA's available U.S. Treasury borrowing authority.

DSR is applicable when BPA uses the funds made available from DOP to early-amortize Federal Transmission obligations. The stream of annual all-in costs from the DSR transaction is assigned to Transmission Services and recovered in transmission rates. The all-in costs include debt service on tax-exempt and taxable bonds and other costs associated with the DSR transaction, which are described later. Conversely, the costs attached to these EN refinancing bonds are no longer assigned for recovery from Power revenues.

Transmission's total DSR payment obligation and the related relief of Power's payment obligations are shown in table 8-2. Transmission's total principal obligation can be higher or

lower than the total principal relief for Power if premium or discount bonds are issued. The interest associated with outstanding obligations may change over time if DSR bonds are refinanced for interest savings.

	A	B	C	D	E	F
1	Table 8-1					
2	LEASE PURCHASE PAYMENT STREAM					
3	(\$000s)					
4						
5		A	B	C	D	E
6		FISCAL YEAR	PRINCIPAL	INTEREST	EXPENSES	TOTAL
7	1	2014	-	37,671	1,215	38,886
8	2	2015	-	45,467	1,099	46,565
9	3	2016	-	48,326	897	49,222
10	4	2017	-	49,304	583	49,888
11	5	2018	-	51,188	554	51,742
12	6	2019	-	56,993	420	57,413
13	7	2020	-	61,980	222	62,202
14	8	2021	-	74,248	131	74,379
15	9	2022	-	74,248	107	74,355
16	10	2023	-	74,248	110	74,358
17	11	2024	-	74,248	113	74,361
18	12	2025	-	74,248	116	74,364
19	13	2026	-	74,248	120	74,368
20	14	2027	-	74,248	123	74,371
21	15	2028	-	74,248	127	74,375
22	16	2029	-	74,248	131	74,379
23	17	2030	-	74,248	134	74,383
24	18	2031	-	74,248	139	74,387
25	19	2032	-	74,248	143	74,391
26	20	2033	89,689	74,248	147	164,084
27	21	2034	29,896	69,456	72	99,424
28	22	2035	-	67,816	48	67,863
29	23	2036	-	67,816	49	67,865
30	24	2037	150,000	67,816	50	217,866
31	25	2038	183,370	60,023	51	243,444
32	26	2039	152,680	49,980	53	202,712
33	27	2040	133,190	40,927	54	174,171
34	28	2041	175,617	32,995	56	208,669
35	29	2042	140,108	22,750	50	162,908
36	30	2043	193,152	16,119	-	209,271
37	31	2044	71,798	4,422	-	76,220
38	32	Total	1,319,499	1,816,273	7,114	3,142,886

	A	B	C	D	E	G	H	I
1	Table 8-2							
2	RELIEF OF GENERATION & TRANSMISSION'S DSR OBLIGATION							
3	(\$000s)							
4								
5		A	B	C	D	E	F	
6		RELIEF OF GENERATION OBLIGATION			TRANSMISSION DSR PAYMENT OBLIGATION			
7		BPA FY	PRINCIPAL	INTEREST	TOTAL	PRINCIPAL	INTEREST	TOTAL
8	1	2004	-	16,366	16,366	-	15,088	15,088
9	2	2005	-	27,505	27,505	-	25,240	25,240
10	3	2006	-	35,780	35,780	-	33,041	33,041
11	4	2007	674	45,812	46,486	716	42,809	43,524
12	5	2008	4,271	57,069	61,340	4,518	51,369	55,887
13	6	2009	9,950	61,506	71,456	10,432	56,154	66,586
14	7	2010	12	62,109	62,121	12	57,173	57,185
15	8	2011	147	61,999	62,146	154	57,327	57,480
16	9	2012	39,287	59,879	99,165	41,165	55,051	96,216
17	10	2013	157,982	57,078	215,060	165,827	51,887	217,714
18	11	2014	166,651	48,411	215,062	175,119	44,348	219,466
19	12	2015	177,787	37,132	214,918	185,160	35,053	220,213
20	13	2016	175,956	29,126	205,081	185,303	25,366	210,669
21	14	2017	188,366	21,917	210,283	199,991	17,037	217,028
22	15	2018	181,629	13,191	194,821	191,504	9,509	201,013
23	16	2019	4,727	4,608	9,335	4,838	4,440	9,277
24	17	2020	16,837	4,378	21,215	19,592	1,816	21,408
25	18	2021	17,677	3,537	21,214	20,571	879	21,449
26	19	2022	18,555	2,655	21,210	21,596	(107)	21,489
27	20	2023	19,487	1,729	21,216	22,678	(1,138)	21,540
28	21	2024	15,157	756	15,914	17,640	(1,456)	16,184
29	22	Total	1,195,152	652,545	1,847,697	1,266,815	580,882	1,847,697

9. REPAYMENT PERIOD REPLACEMENTS

9.1 Introduction

Consistent with the requirements of Department of Energy Order RA 6120.2, each repayment study includes funding for replacements to the transmission system during the repayment period. The purpose of these investments is to maintain the existing revenue-generating capability of the system. This schedule is expressed in mid-year dollars for the study year and is assigned the interest rates of the projected long-term borrowing for the study year.

9.2 Transmission Replacements

BPA's Transmission replacement methodology combines the Iowa Curve methodology, the Handy-Whitman Index, and BPA's expected service lives of its assets to produce projected replacements through the cost evaluation period. The Iowa Curves are a set of curves with different shapes corresponding to how much of an initial asset survives as a function of time. They are described in the book "Statistical Analyses of Industrial Property Retirements" by Robley Winfrey, Bulletin 125 Revised, Engineering Research Institute, Iowa State University, April 1967. The specific curves are assigned to FERC Accounts in BPA's depreciation study.

BPA's total plant is analyzed, by FERC account and in-service date, and assigned the various FERC Accounts Iowa Curves as determined by the depreciation study. A table from Winfrey's book, table 22 – TOTAL RENEWALS FOR TYPE CURVES, tells what fraction of plant represented by a given curve will have to be replaced each tenth of a lifetime to maintain the initial plant. A data file with the contents of table 22, accurate to 12 lifetimes, is used in calculating repayment period transmission replacements. For each of the Iowa Curves, table 22 identifies a percentage of plant to be replaced for each tenth of a lifetime.

The Handy-Whitman Index provides cost trends for electric, gas, telephone, and water utilities in geographical regions of generally similar characteristics. The Handy-Whitman Index numbers are widely used in the industry to trend original cost records to estimate reproduction cost at prices prevailing at a later date. The cost trends for each of the utilities are further subdivided by type of plant. In particular, the cost trends provided by the Index for electrical utilities include trends for total transmission plant and trends for the major FERC accounts within transmission plant. BPA uses the trends for individual FERC accounts when they are available. When the Handy-Whitman Index does not provide a cost trend for a specific account, BPA used the trends for total transmission plant.

To determine replacement costs, BPA also must determine the expected service life of its assets. BPA assigns most assets an expected service life based on its periodic depreciation studies. The service life determined by the depreciation studies reflects early retirements that may occur as a result of facility upgrades to expand the system for load growth and other system conditions. However, for assets that are more likely to be retired early to facilitate upgrades, replacements are based on the expected physical life of the asset, not on a lifetime that is shortened by early retirements. The purpose of repayment period replacements is to maintain the *existing* system's revenue-producing capability over the repayment period. These assets are retired early to facilitate expansion of the system. If service life was used for determining replacements for

these assets, we would be forecasting replacements for an expanded system and therefore overstating costs.

BPA has long assumed that transmission towers and fixtures (FERC Account 354) have an expected service life that matches their expected physical life of 100 years, despite the depreciation study assigning that account a service life of 65 years. For other accounts, this study uses the service life developed by the latest BPA depreciation study produced in 2012.

Transmission plant investment by FERC account and in-service year was obtained from BPA's plant investment records. Based on the year plant was placed in service and the year of the cost evaluation period being analyzed, BPA calculated the number of tenths of a lifetime since the plant was placed in service. The result was then indexed using the appropriate survival curve in table 22 to identify the portion of plant that would be replaced in a given tenth of a lifetime. Next, the original plant investment was inflated to study-year dollars using the Handy-Whitman Index and BPA's inflation forecast. Projected plant investment was added for the rate period. The result was multiplied by the portion of plant that should be replaced, as indicated by table 22, and the portion of the expected service life to yield a cost of replacement in the cost evaluation year for a given year's investment. The product is the replacement cost for FERC account and in-service year. Finally, these replacement costs were accumulated by future year and FERC account.

BPA's capital program includes a replacement program that recognizes that some historical plant is retired over time. If future replacements were calculated for the planned replacement program, a double counting would occur. Therefore, the projections for a cost evaluation year were reduced by the amount calculated for replacements for the same year. Future replacements were then calculated for only the remaining net initial investment of that year.

9.3 Replacement Credits

Replacement credits are calculated for two sets of customer-funded plant, the AC Intertie and facilities constructed for the dedicated use of a customer through the Projects Funded in Advance mechanism.

The cost evaluation period data for the AC Intertie is determined by multiplying the total replacements for each year by the average proportion of actual plant that is attributed to the AC Intertie. The result is then multiplied by 22 percent, the AC Intertie capacity owners' share of the Intertie. The results are the future replacements for the total AC. These replacements are multiplied by the appropriate percentage representing the amount that will be allocated to the capacity owners to obtain the future contributions required from capacity owners. The future replacement costs for the cost evaluation period are included in the repayment study, and the associated contributions from capacity owners are also included as negative expenses.

BPA receives funds from customers for the construction of facilities that are dedicated to the use of those customers, known as Projects Funded in Advance (PFIA). Although the customer-financed facilities are BPA assets, the customer is responsible for the future cost of replacement of these facilities. As with the AC Intertie, BPA calculates the future replacement cost of customer-financed facilities. Because the customer will provide the up-front funding for the replacements, that funding is applied as a credit against future replacement costs in the repayment study. The replacement credit for these facilities is calculated as a percentage of the total replacement cost for each account based on the portion of plant in each account that has been funded through customer advances.

	A	B	C	D	E
1	Table 9-1: FUTURE REPLACEMENTS FOR FY 2016				
2	(\$000s)				
3					
4		A	B	C	
5		FY	AMOUNT	RATE	DUE
6	1	2017	183,360	5.070%	2052
7	2	2018	191,559	5.070%	2053
8	3	2019	198,805	5.070%	2054
9	4	2020	206,036	5.070%	2055
10	5	2021	211,032	5.070%	2056
11	6	2022	218,095	5.070%	2057
12	7	2023	224,307	5.070%	2058
13	8	2024	230,400	5.070%	2059
14	9	2025	235,625	5.070%	2060
15	10	2026	240,341	5.070%	2061
16	11	2027	245,011	5.070%	2062
17	12	2028	249,147	5.070%	2063
18	13	2029	253,031	5.070%	2064
19	14	2030	257,142	5.070%	2065
20	15	2031	261,208	5.070%	2066
21	16	2032	265,356	5.070%	2067
22	17	2033	269,936	5.070%	2068
23	18	2034	274,348	5.070%	2069
24	19	2035	279,210	5.070%	2070
25	20	2036	284,238	5.070%	2071
26	21	2037	288,012	5.070%	2072
27	22	2038	292,229	5.070%	2073
28	23	2039	296,795	5.070%	2074
29	24	2040	301,108	5.070%	2075
30	25	2041	304,160	5.070%	2076
31	26	2042	308,309	5.070%	2077
32	27	2043	313,004	5.070%	2078
33	28	2044	317,533	5.070%	2079
34	29	2045	322,291	5.070%	2080
35	30	2046	326,523	5.070%	2081
36	31	2047	329,815	5.070%	2082
37	32	2048	334,044	5.070%	2083
38	33	2049	339,003	5.070%	2084
39	34	2050	342,853	5.070%	2085
40	35	2051	345,791	5.070%	2086

	A	B	C	D	E
1	Table 9-2: FUTURE REPLACEMENTS FOR FY 2017				
2	(\$000s)				
3					
4		A	B	C	
5		FY	AMOUNT	RATE	DUE
6	1	2018	195,278	5.250%	2053
7	2	2019	202,689	5.250%	2054
8	3	2020	210,104	5.250%	2055
9	4	2021	215,186	5.250%	2056
10	5	2022	222,367	5.250%	2057
11	6	2023	228,727	5.250%	2058
12	7	2024	235,874	5.250%	2059
13	8	2025	241,196	5.250%	2060
14	9	2026	245,991	5.250%	2061
15	10	2027	250,787	5.250%	2062
16	11	2028	255,968	5.250%	2063
17	12	2029	259,963	5.250%	2064
18	13	2030	264,141	5.250%	2065
19	14	2031	268,275	5.250%	2066
20	15	2032	273,453	5.250%	2067
21	16	2033	278,179	5.250%	2068
22	17	2034	282,664	5.250%	2069
23	18	2035	287,600	5.250%	2070
24	19	2036	292,745	5.250%	2071
25	20	2037	297,546	5.250%	2072
26	21	2038	301,827	5.250%	2073
27	22	2039	306,532	5.250%	2074
28	23	2040	310,943	5.250%	2075
29	24	2041	314,969	5.250%	2076
30	25	2042	319,181	5.250%	2077
31	26	2043	323,949	5.250%	2078
32	27	2044	328,544	5.250%	2079
33	28	2045	334,222	5.250%	2080
34	29	2046	338,574	5.250%	2081
35	30	2047	341,921	5.250%	2082
36	31	2048	346,218	5.250%	2083
37	32	2049	351,395	5.250%	2084
38	33	2050	356,081	5.250%	2085
39	34	2051	359,069	5.250%	2086
40	35	2052	362,056	5.250%	2087

	A	B	C	D	E	F	G	H
1	Table 9-3: REPLACEMENT CREDITS							
2	(\$000s)							
3								
4			A	B	C	D	E	F
5			AC INTERTIE		PFIA		TOTAL	
6			1.48% of Total Replacements ^{1/}		2.49% of Total Replacements			
7			2016 STUDY	2017 STUDY	2016 STUDY	2017 STUDY	2016 STUDY	2017 STUDY
8	1	2017	(2,715)	-	(4,566)	-	(7,280)	-
9	2	2018	(2,836)	(2,891)	(4,770)	(4,862)	(7,606)	(7,754)
10	3	2019	(2,944)	(3,001)	(4,950)	(5,047)	(7,894)	(8,048)
11	4	2020	(3,051)	(3,111)	(5,130)	(5,232)	(8,181)	(8,342)
12	5	2021	(3,125)	(3,186)	(5,255)	(5,358)	(8,379)	(8,544)
13	6	2022	(3,229)	(3,292)	(5,431)	(5,537)	(8,660)	(8,829)
14	7	2023	(3,321)	(3,387)	(5,585)	(5,695)	(8,906)	(9,082)
15	8	2024	(3,411)	(3,492)	(5,737)	(5,873)	(9,148)	(9,366)
16	9	2025	(3,489)	(3,571)	(5,867)	(6,006)	(9,356)	(9,577)
17	10	2026	(3,558)	(3,642)	(5,984)	(6,125)	(9,543)	(9,767)
18	11	2027	(3,628)	(3,713)	(6,101)	(6,245)	(9,728)	(9,958)
19	12	2028	(3,689)	(3,790)	(6,204)	(6,374)	(9,893)	(10,163)
20	13	2029	(3,746)	(3,849)	(6,300)	(6,473)	(10,047)	(10,322)
21	14	2030	(3,807)	(3,911)	(6,403)	(6,577)	(10,210)	(10,488)
22	15	2031	(3,867)	(3,972)	(6,504)	(6,680)	(10,372)	(10,652)
23	16	2032	(3,929)	(4,049)	(6,607)	(6,809)	(10,536)	(10,858)
24	17	2033	(3,997)	(4,119)	(6,721)	(6,927)	(10,718)	(11,045)
25	18	2034	(4,062)	(4,185)	(6,831)	(7,038)	(10,893)	(11,223)
26	19	2035	(4,134)	(4,258)	(6,952)	(7,161)	(11,086)	(11,419)
27	20	2036	(4,208)	(4,334)	(7,078)	(7,289)	(11,286)	(11,624)
28	21	2037	(4,264)	(4,405)	(7,172)	(7,409)	(11,436)	(11,814)
29	22	2038	(4,327)	(4,469)	(7,277)	(7,515)	(11,603)	(11,984)
30	23	2039	(4,394)	(4,539)	(7,390)	(7,633)	(11,785)	(12,171)
31	24	2040	(4,458)	(4,604)	(7,498)	(7,742)	(11,956)	(12,346)
32	25	2041	(4,503)	(4,663)	(7,574)	(7,843)	(12,077)	(12,506)
33	26	2042	(4,565)	(4,726)	(7,677)	(7,948)	(12,242)	(12,673)
34	27	2043	(4,634)	(4,796)	(7,794)	(8,066)	(12,428)	(12,863)
35	28	2044	(4,701)	(4,864)	(7,907)	(8,181)	(12,608)	(13,045)
36	29	2045	(4,772)	(4,948)	(8,025)	(8,322)	(12,797)	(13,271)
37	30	2046	(4,835)	(5,013)	(8,130)	(8,430)	(12,965)	(13,443)
38	31	2047	(4,883)	(5,062)	(8,212)	(8,514)	(13,096)	(13,576)
39	32	2048	(4,946)	(5,126)	(8,318)	(8,621)	(13,264)	(13,747)
40	33	2049	(5,019)	(5,203)	(8,441)	(8,750)	(13,460)	(13,953)
41	34	2050	(5,076)	(5,272)	(8,537)	(8,866)	(13,613)	(14,139)
42	35	2051	(5,120)	(5,316)	(8,610)	(8,941)	(13,730)	(14,257)
43	36	2052	-	(5,361)	-	(9,015)	-	(14,376)
44								
45	1/ Represents share (22%) of the 6.73% average AC plant represents of total Transmission plant.							
46								

	A	B	C	D	E	F	G
1	Table 9-4: SUMMARY OF HISTORICAL PLANT INVESTMENT						
2	AS OF 9/30/2013						
3							
4							
5							
6		A	B	C	D	E	F
		FERC ACCOUNT	ACCOUNT NAME	TOTAL PLANT	AC INTERTIE	PFIA	ALL OTHER
7	1	352	STRUCTURES & IMPROVEMENTS	330,100,884	26,469,503	3,261,421	300,369,960
8	2	353	STATION EQUIPMENT	3,138,057,905	329,898,991	70,982,065	2,737,176,849
9	3	354	TOWERS & FIXTURES	1,131,437,632	35,519,049	18,735,818	1,077,182,764
10	4	355	POLES & FIXTURES	323,629,579	1,728,256	16,747,818	305,153,505
11	5	356	CONDUCTOR & CLEARING ROW	1,177,991,395	43,500,715	16,591,033	1,117,899,647
12	6	358	UNDERGROUND CONDUCTOR & DEVICES	21,865,435	-	-	21,865,435
13	7	359	ROADS & TRAILS	178,848,349	6,056,355	763,614	172,028,380
14	8	397	COMMUNICATION EQUIPMENT	601,043,583	21,407,173	43,139,982	536,496,428
15	9		TOTAL	6,902,974,761	464,580,041	170,221,751	6,268,172,969
16							

**Table 9-5:
Plant Investment by Account and Year of Investment**

	A	B	C	D	E	F	G	H	I	J	K
1	A		B	C	D	E	F	G	H	I	J
2	1	ACCOUNT	352	353	354	355	356	358	359	397	
3	2	NAME	STRUCTURES & IMPROVEMENTS	STATION EQUIPMENT	TOWERS & FIXTURES	POLES & FIXTURES	CONDUCTOR & CLEARING ROW	UNDERGROUND CONDUCTOR & DEVICES	ROADS & TRAILS	COMMUNICATION EQUIPMENT	TOTAL
4	3	CURVE	R2.5	S1	R3	R2.5	R4	S3	R3	S2	
5	4	SERVICE LIFE	65	45	100	55	100	40	75	19	
6	5	1940	476,062	1,812,502	926,103	25,606	1,079,234	-	91,782		4,411,289
7	6	1941	927,550	917,191	3,730,079	433,380	6,515,414	-	144,555		12,668,169
8	7	1942	655,363	1,339,495	67,986	210,246	1,257,105	-	289,447		3,819,642
9	8	1943	587,688	1,105,707	4,226,245	36,859	2,895,795	-	381,085		9,233,379
10	9	1944	14,066	8,933	918	16,690	305,568	-	131,489		477,664
11	10	1945	32,032	268,695	536,141	136,702	742,578	-	129,005		1,845,152
12	11	1946	153,424	318,920	602,984	50,451	299,611	-	41,441		1,466,831
13	12	1947	64,746	20,890	9,107	183,835	547,687	-	112,439		938,704
14	13	1948	282,743	1,351,847	324,789	398,494	1,761,543	-	160,519		4,279,935
15	14	1949	88,566	1,994,547	393,538	899,670	1,575,879	-	114,243		5,066,444
16	15	1950	657,081	1,797,360	3,994,408	707,803	5,500,526	-	949,689		13,606,867
17	16	1951	420,867	2,705,453	2,043,375	713,559	4,276,588	-	11,879		10,171,722
18	17	1952	355,096	2,054,048	7,179,525	479,848	7,133,967	193,932	9,140		17,405,556
19	18	1953	1,394,228	8,777,672	9,406,359	3,090,439	10,927,304	-	231,375		33,827,378
20	19	1954	835,601	2,876,027	13,091,368	1,303,062	12,296,500	-	1,581,255		31,983,813
21	20	1955	841,817	4,918,080	2,126,071	386,867	2,605,388	-	49,245		10,927,468
22	21	1956	711,374	7,184,829	16,294,005	349,009	12,765,653	-	355,213		37,660,084
23	22	1957	1,039,728	7,209,196	1,477,666	991,206	3,641,597	-	299,050		14,658,443
24	23	1958	577,916	4,155,308	5,493,794	1,759,261	6,958,712	-	738,896		19,683,887
25	24	1959	308,063	6,755,886	2,159,559	1,035,953	3,358,277	-	236,348	-	13,854,086
26	25	1960	121,487	2,517,503	756,488	336,802	1,104,808	-	38,778		4,875,865
27	26	1961	378,023	3,682,537	3,183,277	717,643	4,168,609	-	283,261		12,413,350
28	27	1962	513,912	2,532,676	11,358,446	1,232,702	9,760,967	-	529,044		25,927,747
29	28	1963	257,014	1,831,817	1,222,631	411,811	1,840,281	-	405,707		5,969,261
30	29	1964	545,408	2,295,248	12,142,615	193,118	1,538,415	-	52,736		16,767,540
31	30	1965	164,570	2,574,919	8,881,139	277,461	23,513,104	-	538,436		35,949,629
32	31	1966	534,437	6,448,389	4,065,177	1,078,563	6,173,805	-	264,808	-	18,565,178
33	32	1967	1,082,426	7,662,147	11,213,131	775,955	11,962,679	284,507	235,346		33,216,190
34	33	1968	2,586,901	14,631,972	34,619,212	398,131	36,706,310	-	1,035,661	-	89,978,187
35	34	1969	1,929,033	14,902,901	25,131,430	1,128,553	27,655,524	-	487,407	-	71,234,847
36	35	1970	11,392,850	38,007,381	26,607,338	1,132,938	28,490,386	-	943,394		106,574,287
37	36	1971	1,339,043	8,888,950	15,948,455	724,414	14,206,774	-	328,307	-	41,435,943
38	37	1972	2,187,552	12,490,376	14,909,761	1,182,298	18,851,150	-	878,608		50,499,745

**Table 9-5:
Plant Investment by Account and Year of Investment**

	A	B	C	D	E	F	G	H	I	J	K
1	A		B	C	D	E	F	G	H	I	J
2	1	ACCOUNT	352	353	354	355	356	358	359	397	
3	2	NAME	STRUCTURES & IMPROVEMENTS	STATION EQUIPMENT	TOWERS & FIXTURES	POLES & FIXTURES	CONDUCTOR & CLEARING ROW	UNDERGROUND CONDUCTOR & DEVICES	ROADS & TRAILS	COMMUNICATION EQUIPMENT	TOTAL
4	3	CURVE	R2.5	S1	R3	R2.5	R4	S3	R3	S2	
5	4	SERVICE LIFE	65	45	100	55	100	40	75	19	
39	38	1973	2,032,890	11,860,844	28,621,272	507,773	26,205,327	1,493,582	1,613,013	-	72,334,701
40	39	1974	955,300	12,475,644	6,503,689	1,527,927	7,245,614	-	1,101,600	-	29,809,774
41	40	1975	3,411,759	21,707,421	20,932,602	1,555,515	14,493,367	-	1,319,642	-	63,420,306
42	41	1976	1,730,520	20,019,399	32,771,629	2,029,686	29,176,322	1,317,799	860,285	-	87,905,640
43	42	1977	2,211,926	22,288,765	52,128,905	1,432,076	57,076,176	64,799	946,696	-	136,149,343
44	43	1978	1,156,144	33,453,208	7,713,140	1,381,584	7,584,533	43,378	50,708	-	51,382,695
45	44	1979	829,125	13,900,487	9,161,554	1,970,345	12,018,086	-	1,336,894	-	39,216,491
46	45	1980	1,553,847	18,000,316	14,400,660	780,350	16,022,767	-	201,487	-	50,959,427
47	46	1981	2,361,683	33,936,118	61,360,719	1,234,848	64,049,936	-	526,795	-	163,470,099
48	47	1982	1,831,205	31,235,190	3,575,782	662,029	5,060,449	-	355,871	-	42,720,526
49	48	1983	4,938,306	37,003,778	28,577,207	2,931,584	28,663,225	-	826,879	-	102,940,979
50	49	1984	6,818,386	52,095,432	76,260,479	3,244,293	78,997,002	-	8,388,752	-	225,804,344
51	50	1985	7,875,754	49,228,437	286,797	1,929,796	1,561,203	4,573,403	59,347	-	65,514,737
52	51	1986	4,967,389	21,648,043	7,491,442	8,485,733	16,210,096	-	742,455	-	59,545,158
53	52	1987	7,506,190	32,340,604	100,490,771	13,847,331	145,470,634	-	40,286,606	-	339,942,136
54	53	1988	8,268,167	19,372,113	4,837,575	2,508,510	6,810,774	-	309,066	-	42,106,205
55	54	1989	25,777,277	105,837,423	2,055,601	3,645,863	2,294,160	-	141,340	-	139,751,664
56	55	1990	3,704,482	51,930,584	3,377,301	1,341,163	2,590,241	-	-	-	62,943,771
57	56	1991	6,621,529	93,186,876	1,304,831	1,493,504	3,257,771	-	-	-	105,864,511
58	57	1992	3,157,930	118,942,933	11,015,954	2,025,109	20,029,162	-	2,021,035	-	157,192,123
59	58	1993	8,269,431	77,266,995	14,158,498	2,859,084	23,645,239	-	4,253,512	-	130,452,759
60	59	1994	28,174,069	231,481,549	5,806,581	3,641,305	4,863,220	-	117,722	-	274,084,446
61	60	1995	11,104,797	66,685,299	825,569	996,873	5,071,877	-	201,091	21,205,386	106,090,892
62	61	1996	6,766,302	80,581,744	1,685,145	198,282	3,844,738	-	1,925	39,790,978	132,869,114
63	62	1997	7,022,574	86,057,649	15,093,318	2,160,086	12,029,703	13,996	2,634,641	46,458,040	171,470,007
64	63	1998	11,205,585	52,296,087	8,932,174	2,860,997	12,737,573	7,328	1,782,782	49,096,462	138,918,988
65	64	1999	5,425,683	75,801,415	(644,635)	7,715,074	121,378	-	416,353	79,012,124	167,847,392
66	65	2000	1,548,591	39,830,312	89,833	2,071,939	654,477	-	428	7,811,984	52,007,564
67	66	2001	2,901,840	58,925,772	1,404,165	4,261,666	2,921,401	-	1,197,852	7,643,129	79,255,825
68	67	2002	6,639,600	85,493,827	1,956,554	23,741,448	14,693,786	5,548,135	806,409	29,960,602	168,840,362
69	68	2003	7,172,199	113,387,384	23,211,669	7,159,904	19,106,084	9,405	1,152,777	33,722,915	204,922,337
70	69	2004	6,305,985	147,315,945	44,017,733	12,557,226	16,120,192	26,853	1,148,355	27,587,094	255,079,382
71	70	2005	6,785,951	98,550,784	65,512,047	18,608,221	49,892,215	-	14,830	24,301,368	263,665,415

**Table 9-5:
Plant Investment by Account and Year of Investment**

	A	B	C	D	E	F	G	H	I	J	K
1	A		B	C	D	E	F	G	H	I	J
2	1	ACCOUNT	352	353	354	355	356	358	359	397	
3	2	NAME	STRUCTURES & IMPROVEMENTS	STATION EQUIPMENT	TOWERS & FIXTURES	POLES & FIXTURES	CONDUCTOR & CLEARING ROW	UNDERGROUND CONDUCTOR & DEVICES	ROADS & TRAILS	COMMUNICATION EQUIPMENT	TOTAL
4	3	CURVE	R2.5	S1	R3	R2.5	R4	S3	R3	S2	
5	4	SERVICE LIFE	65	45	100	55	100	40	75	19	
72	71	2006	12,062,449	82,574,783	74,122,412	9,641,185	45,701,248	8,218,798	697,144	48,718,944	281,736,963
73	72	2007	8,059,402	73,468,007	1,340,875	15,000,211	9,620,210	20,273	5,069,935	23,600,950	136,179,863
74	73	2008	6,165,343	93,138,841	4,094,580	28,467,955	13,219,453	-	4,455,860	25,811,888	175,353,920
75	74	2009	8,144,329	107,550,433	482,741	7,908,823	3,621,393	-	3,120,294	11,254,036	142,082,050
76	75	2010	7,820,685	142,473,362	31,433,761	43,086,120	23,975,563	-	12,891,176	35,067,066	296,747,733
77	76	2011	9,044,032	122,607,342	9,274,022	23,975,907	18,771,527	-	12,736,052	27,667,948	224,076,829
78	77	2012	12,217,990	156,599,491	106,864,593	16,322,045	72,871,097		28,343,785	39,812,948	433,031,950
79	78	<u>2013</u>	<u>26,097,572</u>	<u>169,467,868</u>	<u>4,546,280</u>	<u>13,060,878</u>	<u>7,034,784</u>	<u>49,246</u>	<u>24,632,389</u>	<u>22,519,721</u>	<u>267,408,737</u>
80	79	Total	330,100,884	3,138,057,905	1,131,198,944	323,629,579	1,177,751,740	21,865,435	178,843,371	601,043,583	6,902,491,440

	A	B	C	D	E	F
1	Table 9-6: PLANT INVESTMENT BY ACCOUNT FOR REPLACEMENT CALCULATIONS					
2	(\$000s)					
3						
4		A	B	C	D	
5						
6		ACCOUNTS	2014	2015	2016	2017
7	1	LINES 354	88,033	136,646	170,339	150,753
8	2	SUBS 353	80,162	94,082	146,957	339,217
9	3	COMM EQUIP 397	-	10,842,229	17,202,997	-
10	4	TOTAL	168,195	11,072,957	17,520,293	489,970
11						
12						
13						
14						
15						
16						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Table 9-7: STATISTICAL ANALYSIS OF INDUSTRIAL PROPERTY RETIREMENTS																					
2																						
3																						
4	Tenth of Life	L0	L1	L2	L3	L4	L5	S0	S1	S2	S3	S4	S5	S6	R0.5	R1	R2	R2.5	R3	R4	R5	O1
5	1	2.93	0.95	0.11	-	-	-	1.17	0.16	-	-	-	-	-	2.42	2.78	1.14	0.65	0.15	0.02	-	2.53
6	2	4.82	2.09	0.68	0.08	-	-	2.68	0.89	0.12	-	-	-	-	3.49	3.23	1.57	0.99	0.40	0.06	-	5.25
7	3	5.92	3.64	1.60	0.47	-	-	3.84	2.03	0.58	0.06	-	-	-	4.29	3.69	2.12	1.50	0.88	0.19	-	5.52
8	4	6.72	5.35	2.78	1.22	0.16	-	4.83	3.36	1.59	0.38	-	-	-	4.98	4.18	2.81	2.21	1.60	0.51	-	5.80
9	5	7.32	6.90	4.83	2.40	0.95	0.01	5.71	4.78	3.16	1.34	0.10	-	-	5.64	4.76	3.67	3.13	2.59	1.18	0.05	6.10
10	6	7.77	7.95	7.42	4.63	2.64	0.46	6.52	6.17	5.18	3.32	0.79	0.02	-	6.31	5.47	4.73	4.28	3.83	2.45	0.46	6.41
11	7	8.18	8.45	9.50	8.28	5.00	2.64	7.25	7.48	7.39	6.36	3.28	0.46	-	7.01	6.31	6.01	5.69	5.37	4.53	1.96	6.74
12	8	8.54	8.82	10.62	12.11	8.66	6.70	7.94	8.63	9.49	10.00	8.66	4.05	0.36	7.75	7.25	7.50	7.50	7.50	7.49	5.59	7.09
13	9	8.87	9.16	10.85	14.12	16.35	14.73	8.56	9.61	11.20	13.32	15.88	15.63	8.93	8.48	8.25	9.17	9.78	10.38	11.23	13.40	7.45
14	10	9.16	9.47	10.58	13.60	20.53	28.50	9.14	10.37	12.30	15.36	21.28	29.85	40.71	9.20	9.24	10.85	12.21	13.57	17.14	24.92	7.83
15	11	9.41	9.73	10.20	11.66	16.77	23.71	9.67	10.92	12.71	15.52	21.28	29.85	40.71	9.85	10.16	12.32	14.13	15.94	21.62	29.98	8.23
16	12	9.62	9.93	9.93	9.80	11.27	12.45	10.14	11.24	12.45	13.88	15.91	15.63	8.93	10.41	10.94	13.23	14.72	16.20	18.76	18.70	8.66
17	13	9.78	10.08	9.86	8.80	7.93	6.23	10.54	11.34	11.68	11.17	8.80	4.05	0.36	10.84	11.52	13.26	13.53	13.79	11.69	4.71	9.10
18	14	9.92	10.18	9.94	8.70	6.40	3.26	10.86	11.24	10.64	8.49	3.79	0.47	-	11.12	11.84	12.34	11.16	9.97	5.69	0.49	9.57
19	15	10.01	10.24	10.06	9.14	6.00	2.09	11.08	10.96	9.61	6.79	2.20	0.14	-	11.20	11.86	10.85	9.24	7.63	3.08	0.65	10.06
20	16	10.08	10.25	10.16	9.76	6.57	2.78	11.20	10.54	8.84	6.50	3.31	0.74	0.01	11.10	11.56	9.54	7.94	6.34	3.94	1.78	10.57
21	17	10.12	10.24	10.19	10.26	8.12	5.42	11.17	10.05	8.52	7.44	6.10	2.95	0.30	10.81	10.97	8.66	7.49	6.31	5.87	4.13	11.11
22	18	10.15	10.21	10.16	10.48	10.34	9.68	10.95	9.55	8.69	8.99	9.76	8.16	3.18	10.37	10.18	8.04	7.86	7.68	8.19	8.17	11.68
23	19	10.15	10.16	10.09	10.42	12.28	14.97	10.48	9.17	9.23	10.50	13.32	15.90	14.83	9.85	9.39	8.17	8.65	9.13	10.67	13.68	12.28
24	20	10.14	10.11	10.02	10.18	12.93	18.28	9.55	9.08	9.89	11.51	15.55	22.11	31.68	9.36	8.87	8.94	9.70	10.46	12.94	18.94	12.91
25	21	10.12	10.06	9.96	9.94	12.22	16.98	8.86	9.43	10.38	11.87	15.61	22.11	31.68	9.12	8.74	9.66	10.57	11.48	14.43	20.78	11.01
26	22	10.10	10.01	9.93	9.80	10.88	12.84	9.22	9.81	10.62	11.60	13.57	15.90	14.83	9.41	9.15	10.24	11.12	12.00	14.40	17.13	8.76
27	23	10.08	9.97	9.92	9.80	9.62	8.75	9.51	10.06	10.62	10.91	10.39	8.19	3.18	9.66	9.52	10.62	11.27	11.92	12.67	10.08	8.93
28	24	10.05	9.95	9.94	9.89	8.78	5.94	9.73	10.20	10.48	10.07	7.45	3.11	0.30	9.87	9.84	10.79	11.04	11.29	10.00	4.35	9.10
29	25	10.03	9.94	9.96	10.00	8.47	4.73	9.90	10.26	10.25	9.37	5.82	1.35	0.02	10.02	10.08	10.77	10.56	10.35	7.64	2.27	9.26
30	26	10.01	9.94	9.99	10.07	8.69	5.25	10.02	10.25	10.02	8.99	5.88	2.06	0.15	10.13	10.25	10.58	10.01	9.44	6.54	3.02	9.41
31	27	10.00	9.94	10.00	10.10	9.33	7.28	10.10	10.20	9.84	8.99	7.34	4.82	1.23	10.20	10.34	10.30	9.57	8.84	6.85	5.40	9.56
32	28	9.98	9.96	10.02	10.07	10.12	10.24	10.15	10.13	9.75	9.31	9.53	9.42	5.79	10.21	10.36	10.00	9.35	8.70	8.11	8.85	9.69
33	29	9.98	9.97	10.02	10.03	10.73	13.08	10.17	10.05	9.74	9.78	11.62	14.70	16.08	10.19	10.31	9.76	9.37	8.97	9.70	12.74	9.82
34	30	9.98	9.99	10.02	9.98	10.96	14.53	10.16	9.99	9.79	10.23	12.94	18.34	26.73	10.15	10.23	9.61	9.55	9.49	11.13	15.91	9.93
35	31	9.98	10.00	10.01	9.96	10.79	13.98	10.14	9.94	9.89	10.52	13.10	18.35	26.73	10.10	10.13	9.59	9.83	10.06	12.06	16.93	10.03
36	32	9.98	10.01	10.00	9.96	10.38	11.95	10.10	9.91	9.99	10.59	12.15	14.73	16.08	10.03	10.02	9.67	10.09	10.50	12.29	15.07	10.11
37	33	9.98	10.01	10.00	9.98	9.93	9.53	10.06	9.91	10.07	10.47	10.54	9.55	5.79	9.98	9.93	9.82	10.28	10.73	11.77	11.12	10.17
38	34	9.99	10.01	10.00	10.00	9.60	7.61	10.02	9.92	10.12	10.22	8.92	5.26	1.24	9.93	9.86	9.98	10.35	10.71	10.70	7.04	10.21
39	35	9.99	10.01	10.00	10.01	9.46	6.72	9.98	9.95	10.12	9.96	7.86	3.21	0.22	9.91	9.84	10.11	10.31	10.50	9.49	4.65	10.24
40	36	10.00	10.01	10.00	10.02	9.52	7.04	9.94	9.98	10.09	9.76	7.67	3.60	0.51	9.91	9.84	10.19	10.19	10.18	8.57	4.54	10.23
41	37	10.00	10.00	10.00	10.01	9.75	8.36	9.92	10.01	10.04	9.67	8.33	6.01	2.36	9.92	9.88	10.20	10.03	9.86	8.26	6.24	10.20
42	38	10.00	10.00	10.00	10.01	10.02	10.19	9.92	10.03	10.00	9.70	9.49	9.73	7.47	9.95	9.93	10.17	9.90	9.63	8.58	8.94	10.14
43	39	10.00	10.00	10.00	10.00	10.23	11.82	9.93	10.04	9.96	9.82	10.70	13.56	16.07	9.98	9.99	10.10	9.82	9.54	9.33	11.83	10.05
44	40	10.00	10.00	10.00	9.99	10.32	12.63	9.96	10.04	9.95	9.97	11.53	16.02	23.53	10.01	10.03	10.03	9.82	9.61	10.18	14.02	9.92
45	41	10.00	10.00	10.00	9.99	10.28	12.36	9.99	10.02	9.95	10.10	11.73	16.04	23.53	10.03	10.06	9.96	9.87	9.77	10.86	14.74	9.78
46	42	10.00	10.00	10.00	10.00	10.15	11.24	10.02	10.01	9.96	10.17	11.30	13.66	16.07	10.04	10.07	9.92	9.95	9.97	11.18	13.67	9.80
47	43	10.00	10.00	10.00	10.00	9.99	9.80	10.03	10.00	9.98	10.18	10.47	10.02	7.48	10.04	10.06	9.90	10.03	10.15	11.09	11.21	9.85
48	44	10.00	10.00	10.00	10.00	9.87	8.60	10.03	9.99	10.00	10.13	9.56	6.70	2.39	10.03	10.04	9.91	10.08	10.25	10.66	8.43	9.89
49	45	10.00	10.00	10.00	10.00	9.81	8.02	10.03	9.99	10.02	10.05	8.91	4.88	0.70	10.02	10.02	9.94	10.10	10.26	10.06	6.47	9.93
50	46	10.00	10.00	10.00	10.00	9.83	8.19	10.02	10.00	10.02	9.97	8.71	5.02	1.05	10.01	10.00	9.98	10.09	10.20	9.51	6.01	9.96
51	47	10.00	10.00	10.00	10.00	9.90	9.00	10.01	10.00	10.02	9.92	8.99	6.89	3.38	10.00	9.99	10.01	10.05	10.09	9.18	7.01	9.99
52	48	10.00	10.00	10.00	10.00	10.00	10.10	10.01	10.00	10.02	9.90	9.59	9.76	8.49	9.99	9.98	10.04	10.01	9.97	9.16	8.95	10.00
53	49	10.00	10.00	10.00	10.00	10.07	11.07	10.00	10.00	10.01	9.91	10.26	12.63	15.66	9.99	9.97	10.05	9.97	9.88	9.42	11.09	10.02
54	50	10.00	10.00	10.00	10.00	10.11	11.55	9.99	10.00	10.00	9.95	10.77	14.42	21.26	9.98	9.97	1					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Table 9-7: STATISTICAL ANALYSIS OF INDUSTRIAL PROPERTY RETIREMENTS																					
2																						
3																						
4	Tenth of Life	L0	L1	L2	L3	L4	L5	S0	S1	S2	S3	S4	S5	S6	R0.5	R1	R2	R2.5	R3	R4	R5	O1
111	107	10.00	10.00	10.00	10.00	10.00	9.95	10.00	10.00	10.00	10.00	9.96	9.34	6.94	10.00	10.00	10.00	10.00	10.00	9.99	9.53	9.98
112	108	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.97	9.83	9.85	10.00	10.00	10.00	10.00	10.00	9.98	9.66	9.98
113	109	10.00	10.00	10.00	10.00	10.00	10.04	10.00	10.00	10.00	10.00	9.99	10.35	12.81	10.00	10.00	10.00	10.00	10.00	9.99	9.91	9.98
114	110	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	10.00	10.72	14.70	10.00	10.00	10.00	10.00	10.00	10.00	10.18	9.98
115	111	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	10.02	10.80	14.79	10.00	10.00	10.00	10.00	10.00	10.00	10.36	9.98
116	112	10.00	10.00	10.00	10.00	10.00	10.04	10.00	10.00	10.00	10.00	10.03	10.58	13.04	10.00	10.00	10.00	10.00	10.00	10.01	10.40	9.98
117	113	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.02	10.16	10.11	10.00	10.00	10.00	10.00	10.00	10.01	10.29	9.98
118	114	10.00	10.00	10.00	10.00	10.00	9.97	10.00	10.00	10.00	10.00	10.01	9.70	7.21	10.00	10.00	10.00	10.00	10.00	10.01	10.09	9.98
119	115	10.00	10.00	10.00	10.00	10.00	9.95	10.00	10.00	10.00	10.00	10.00	9.38	5.53	10.00	10.00	10.00	10.00	10.00	10.00	9.87	9.98
120	116	10.00	10.00	10.00	10.00	10.00	9.95	10.00	10.00	10.00	10.00	9.99	9.31	5.61	10.00	10.00	10.00	10.00	10.00	9.99	9.71	9.98
121	117	10.00	10.00	10.00	10.00	10.00	9.97	10.00	10.00	10.00	10.00	9.98	9.49	7.27	10.00	10.00	10.00	10.00	10.00	9.99	9.66	9.98
122	118	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.98	9.85	9.86	10.00	10.00	10.00	10.00	10.00	9.99	9.74	9.98
123	119	10.00	10.00	10.00	10.00	10.00	10.02	10.00	10.00	10.00	10.00	9.99	10.25	12.47	10.00	10.00	10.00	10.00	10.00	10.00	9.91	9.98
124	120	10.00	10.00	10.00	10.00	10.00	10.04	10.00	10.00	10.00	10.00	10.00	10.53	14.13	10.00	10.00	10.00	10.00	10.00	10.00	10.10	9.98

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Table 9-7: STATISTICAL ANALYSIS OF INDUSTRIAL PROPERTY RETIREMENTS																					
2																						
3																						
4	Tenth of Life	L0	L1	L2	L3	L4	L5	S0	S1	S2	S3	S4	S5	S6	R0.5	R1	R2	R2.5	R3	R4	R5	O1
61	57	10.00	10.00	10.00	10.00	9.96	9.39	10.00	10.00	10.00	9.98	9.40	7.57	4.25	10.01	10.01	10.00	10.04	10.08	9.66	7.72	9.98
62	58	10.00	10.00	10.00	10.00	10.00	10.05	10.00	10.00	10.00	9.97	9.70	9.75	9.09	10.01	10.01	10.01	10.03	10.04	9.53	9.03	9.97
63	59	10.00	10.00	10.00	10.00	10.02	10.63	10.00	10.00	10.00	9.97	10.08	11.91	15.14	10.00	10.00	10.01	10.01	10.00	9.62	10.58	9.96
64	60	10.00	10.00	10.00	10.00	10.04	10.92	10.00	10.00	10.00	9.98	10.38	13.27	19.53	10.00	10.00	10.02	9.99	9.96	9.79	11.82	9.96
65	61	10.00	10.00	10.00	10.00	10.04	10.85	10.00	10.00	10.00	9.99	10.52	13.34	19.53	10.00	10.00	10.01	9.98	9.94	10.02	12.34	9.96
66	62	10.00	10.00	10.00	10.00	10.02	10.48	10.00	10.00	10.00	10.00	10.46	12.16	15.14	10.00	9.99	10.01	9.98	9.94	10.20	11.98	9.97
67	63	10.00	10.00	10.00	10.00	10.00	9.97	10.00	10.00	10.00	10.01	10.24	10.24	9.12	10.00	9.99	10.00	9.98	9.96	10.30	10.94	9.98
68	64	10.00	10.00	10.00	10.00	9.99	9.52	10.00	10.00	10.00	10.02	9.97	8.35	4.39	10.00	9.99	10.00	9.99	9.98	10.29	9.61	9.99
69	65	10.00	10.00	10.00	10.00	9.98	9.29	10.00	10.00	10.00	10.02	9.74	7.18	2.18	10.00	9.99	9.99	10.00	10.01	10.18	8.51	9.99
70	66	10.00	10.00	10.00	10.00	9.98	9.34	10.00	10.00	10.00	10.01	9.62	7.12	2.44	10.00	10.00	9.99	10.01	10.03	10.03	8.03	9.99
71	67	10.00	10.00	10.00	10.00	9.99	9.62	10.00	10.00	10.00	10.00	9.65	8.12	4.97	10.00	10.00	9.99	10.01	10.03	9.88	8.30	9.99
72	68	10.00	10.00	10.00	10.00	10.00	10.02	10.00	10.00	10.00	9.99	9.80	9.74	9.44	10.00	10.00	10.00	10.02	10.03	9.79	9.16	9.99
73	69	10.00	10.00	10.00	10.00	10.01	10.37	10.00	10.00	10.00	9.99	10.00	11.38	14.60	10.00	10.00	10.00	10.01	10.02	9.78	10.26	9.99
74	70	10.00	10.00	10.00	10.00	10.01	10.55	10.00	10.00	10.00	9.99	10.18	12.42	18.17	10.00	10.00	10.00	10.00	10.00	9.84	11.19	9.99
75	71	10.00	10.00	10.00	10.00	10.01	10.51	10.00	10.00	10.00	9.99	10.28	12.51	18.17	10.00	10.00	10.00	10.00	9.99	9.94	11.63	9.99
76	72	10.00	10.00	10.00	10.00	10.01	10.29	10.00	10.00	10.00	10.00	10.26	11.66	14.62	10.00	10.00	10.00	9.99	9.98	10.05	11.46	9.99
77	73	10.00	10.00	10.00	10.00	10.00	9.99	10.00	10.00	10.00	10.00	10.16	10.25	9.50	10.00	10.00	10.00	9.99	9.98	10.13	10.77	9.98
78	74	10.00	10.00	10.00	10.00	10.00	9.72	10.00	10.00	10.00	10.00	10.01	8.82	5.18	10.00	10.00	10.00	9.99	9.98	10.16	9.85	9.98
79	75	10.00	10.00	10.00	10.00	9.99	9.58	10.00	10.00	10.00	10.00	9.88	7.92	2.98	10.00	10.00	10.00	10.00	9.99	10.13	9.04	9.98
80	76	10.00	10.00	10.00	10.00	9.99	9.60	10.00	10.00	10.00	10.00	9.80	7.83	3.18	10.00	10.00	10.00	10.00	10.00	10.06	8.63	9.98
81	77	10.00	10.00	10.00	10.00	9.99	9.77	10.00	10.00	10.00	10.00	9.80	8.54	5.58	10.00	10.00	10.00	10.01	10.01	9.98	8.74	9.98
82	78	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.87	9.75	9.64	10.00	10.00	10.00	10.01	10.01	9.91	9.30	9.98
83	79	10.00	10.00	10.00	10.00	10.00	10.22	10.00	10.00	10.00	10.00	9.98	10.99	14.09	10.00	10.00	10.00	10.01	10.01	9.88	10.08	9.98
84	80	10.00	10.00	10.00	10.00	10.00	10.33	10.00	10.00	10.00	10.00	10.08	11.79	17.06	10.00	10.00	10.00	10.01	10.01	9.89	10.76	9.98
85	81	10.00	10.00	10.00	10.00	10.00	10.31	10.00	10.00	10.00	10.00	10.14	11.88	17.06	10.00	10.00	10.00	10.00	10.00	9.91	11.13	9.98
86	82	10.00	10.00	10.00	10.00	10.00	10.18	10.00	10.00	10.00	10.00	10.15	11.28	14.12	10.00	10.00	10.00	10.00	10.00	9.97	11.07	9.99
87	83	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.10	10.24	11.07	10.00	10.00	10.00	10.00	10.00	10.03	10.62	9.99
88	84	10.00	10.00	10.00	10.00	10.00	9.84	10.00	10.00	10.00	10.00	10.02	9.16	4.51	10.00	10.00	10.00	10.00	10.00	10.08	9.98	9.99
89	85	10.00	10.00	10.00	10.00	10.00	9.75	10.00	10.00	10.00	10.00	9.94	8.46	3.75	10.00	10.00	10.00	10.00	10.00	10.09	9.39	9.99
90	86	10.00	10.00	10.00	10.00	10.00	9.76	10.00	10.00	10.00	10.00	9.90	8.37	3.88	10.00	10.00	10.00	10.00	10.00	10.07	9.06	9.99
91	87	10.00	10.00	10.00	10.00	10.00	9.86	10.00	10.00	10.00	10.00	9.89	8.88	6.10	10.00	10.00	10.00	10.00	10.00	10.02	9.09	9.99
92	88	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.92	9.77	9.75	10.00	10.00	10.00	10.00	10.00	9.98	9.44	9.98
93	89	10.00	10.00	10.00	10.00	10.00	10.12	10.00	10.00	10.00	10.00	9.98	10.70	13.62	10.00	10.00	10.00	10.00	10.00	9.95	9.98	9.98
94	90	10.00	10.00	10.00	10.00	10.00	10.19	10.00	10.00	10.00	10.00	10.04	11.32	16.13	10.00	10.00	10.00	10.00	10.00	9.94	10.48	9.98
95	91	10.00	10.00	10.00	10.00	10.00	10.19	10.00	10.00	10.00	10.00	10.08	11.42	16.17	10.00	10.00	10.00	10.00	10.00	9.95	10.78	9.98
96	92	10.00	10.00	10.00	10.00	10.00	10.11	10.00	10.00	10.00	10.00	10.08	10.98	13.94	10.00	10.00	10.00	10.00	10.00	9.98	10.78	9.98
97	93	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.06	10.21	10.23	10.00	10.00	10.00	10.00	10.00	10.02	10.49	9.98
98	94	10.00	10.00	10.00	10.00	10.00	9.90	10.00	10.00	10.00	10.00	10.02	9.41	6.06	10.00	10.00	10.00	10.00	10.00	10.04	10.05	9.98
99	95	10.00	10.00	10.00	10.00	10.00	9.85	10.00	10.00	10.00	10.00	9.98	8.86	4.18	10.00	10.00	10.00	10.00	10.00	10.05	9.62	9.98
100	96	10.00	10.00	10.00	10.00	10.00	9.85	10.00	10.00	10.00	10.00	9.95	8.77	4.52	10.00	10.00	10.00	10.00	10.00	10.04	9.36	9.98
101	97	10.00	10.00	10.00	10.00	10.00	9.91	10.00	10.00	10.00	10.00	9.94	9.14	6.55	10.00	10.00	10.00	10.00	10.00	10.01	9.34	9.98
102	98	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.95	9.80	9.81	10.00	10.00	10.00	10.00	10.00	9.98	9.56	9.98
103	99	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	9.98	10.50	13.19	10.00	10.00	10.00	10.00	10.00	9.99	9.93	9.98
104	100	10.00	10.00	10.00	10.00	10.00	10.12	10.00	10.00	10.00	10.00	10.01	10.97	15.36	10.00	10.00	10.00	10.00	10.00	10.01	10.30	9.98
105	101	10.00	10.00	10.00	10.00	10.00	10.11	10.00	10.00	10.00	10.00	10.04	11.06	15.45	10.00	10.00	10.00	10.00	10.00	10.01	10.53	9.98
106	102	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	10.05	10.76	13.46	10.00	10.00	10.00	10.00	10.00	10.02	10.56	9.98
107	103	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.04	10.19	10.12	10.00	10.00	10.00	10.00	10.00	10.02	10.38	9.98
108	104	10.00	10.00	10.00	10.00	10.00	9.94	10.00	10.00	10.00	10.00	10.02	9.57	6.74	10.00	10.00	10.00	10.00				

Table 9-8: Handy-Whitman Index - Pacific Region - January 1, 2013

	A	B	C	D	E	F	G	H
3	A		B	C	D	E	F	G
4	YEAR	TOTAL PLANT	STATION	TOWERS	POLES	OVERHEAD	UNDERGROUND	
5	ACCOUNT	300	EQUIPMENT	& FIXTURES	& FIXTURES	CONDUCTOR	CONDUCTOR	
6			353	354	355	356	358	
7	1	1940	22	35	17	15	22	22
8	2	1941	23	36	19	17	23	25
9	3	1942	25	37	20	18	25	26
10	4	1943	25	36	20	19	26	26
11	5	1944	25	35	21	21	26	25
12	6	1945	26	35	21	22	26	25
13	7	1946	29	39	24	24	30	30
14	8	1947	34	47	28	29	35	35
15	9	1948	37	49	31	32	39	42
16	10	1949	38	52	32	32	39	46
17	11	1950	40	56	34	33	41	49
18	12	1951	45	63	37	36	47	61
19	13	1952	46	64	39	37	49	63
20	14	1953	49	68	41	39	51	62
21	15	1954	50	69	42	40	52	63
22	16	1955	52	70	43	42	55	66
23	17	1956	56	77	46	44	61	65
24	18	1957	57	81	48	47	63	57
25	19	1958	59	84	51	49	63	57
26	20	1959	60	83	53	50	62	60
27	21	1960	60	77	55	52	63	61
28	22	1961	59	70	57	53	63	61
29	23	1962	59	69	57	54	65	61
30	24	1963	59	65	59	55	61	61
31	25	1964	61	69	61	56	64	66
32	26	1965	64	73	63	58	67	72
33	27	1966	67	75	67	61	70	73
34	28	1967	70	79	71	63	73	75
35	29	1968	73	83	74	65	73	73
36	30	1969	78	85	78	69	80	79
37	31	1970	83	89	82	76	89	82
38	32	1971	89	91	87	81	98	82
39	33	1972	93	94	92	87	99	92
40	34	1973	100	100	100	100	100	100
41	35	1974	123	124	123	126	117	134
42	36	1975	145	148	145	144	146	137
43	37	1976	158	157	149	150	172	143
44	38	1977	170	170	155	160	187	158
45	39	1978	175	182	169	171	179	160
46	40	1979	190	197	187	189	193	189

Table 9-8: Handy-Whitman Index - Pacific Region - January 1, 2013

	A	B	C	D	E	F	G	H
3	A		B	C	D	E	F	G
4	YEAR	TOTAL PLANT	STATION	TOWERS	POLES	OVERHEAD	UNDERGROUND	
5	ACCOUNT	300	EQUIPMENT	& FIXTURES	& FIXTURES	CONDUCTOR	CONDUCTOR	
			353	354	355	356	358	
47	41	1980	213	218	210	211	220	221
48	42	1981	231	237	225	233	241	244
49	43	1982	244	253	229	252	251	269
50	44	1983	251	256	234	258	268	273
51	45	1984	252	259	247	260	258	267
52	46	1985	253	260	256	256	252	254
53	47	1986	255	262	261	258	252	275
54	48	1987	257	269	267	261	243	278
55	49	1988	281	281	278	281	311	293
56	50	1989	295	295	287	301	320	314
57	51	1990	304	312	288	312	323	364
58	52	1991	309	315	281	333	333	407
59	53	1992	311	324	284	350	318	416
60	54	1993	323	337	296	360	330	423
61	55	1994	337	352	312	378	340	424
62	56	1995	353	364	322	392	368	436
63	57	1996	359	366	333	407	374	441
64	58	1997	365	372	341	420	379	446
65	59	1998	375	382	347	428	391	450
66	60	1999	396	388	354	419	354	463
67	61	2000	395	415	368	422	398	458
68	62	2001	398	419	373	425	399	468
69	63	2002	411	429	384	450	416	462
70	64	2003	415	438	388	454	411	474
71	65	2004	424	437	415	466	419	481
72	66	2005	465	493	434	487	463	533
73	67	2006	503	528	455	509	537	590
74	68	2007	544	580	472	431	595	603
75	69	2008	588	618	513	567	657	782
76	70	2009	623	654	526	593	657	782
77	71	2010	610	684	520	616	604	837
78	72	2011	622	708	542	599	598	890
79	73	2012	634	730	556	609	591	905
80	74	2013	655	759	568	619	611	948

Table 9-9: 2014 Replacements by Account

	A	B	C	D	E	F	G	H	I	J	K
2			A	B	C	D	E	F	G	H	I
3			352	353	354	355	356	358	359	397	Total
4	1	2017	7,617,083	105,388,998	12,275,671	9,346,774	10,024,607	1,297,815	2,373,785	35,035,261	183,359,994
5	2	2018	8,030,302	108,889,349	12,803,987	9,557,133	10,518,821	1,306,826	2,446,579	38,006,481	191,559,478
6	3	2019	8,189,635	111,986,680	13,284,778	9,697,247	11,054,229	1,379,574	2,651,613	40,561,534	198,805,291
7	4	2020	8,381,137	114,992,816	13,749,288	9,775,094	11,773,951	1,412,572	2,826,177	43,125,086	206,036,121
8	5	2021	8,529,027	117,527,756	14,048,589	9,880,908	12,267,989	1,391,747	2,875,572	44,510,122	211,031,710
9	6	2022	8,794,100	121,132,592	14,558,342	10,030,105	13,011,391	1,370,611	2,922,221	46,276,109	218,095,471
10	7	2023	8,997,369	124,033,668	15,263,509	10,142,282	14,277,543	1,361,738	2,999,166	47,231,393	224,306,668
11	8	2024	9,552,451	126,799,917	15,817,807	10,268,793	15,117,274	1,437,248	3,181,928	48,224,209	230,399,626
12	9	2025	9,744,938	129,375,430	16,740,918	10,326,229	16,185,597	1,424,147	3,248,105	48,580,052	235,625,416
13	10	2026	9,940,287	131,991,316	17,540,153	10,393,228	16,936,257	1,382,618	3,299,348	48,858,100	240,341,308
14	11	2027	10,053,627	135,218,323	17,933,794	10,326,604	17,713,396	1,304,288	3,585,941	48,874,931	245,010,903
15	12	2028	10,151,217	137,673,331	18,696,746	10,402,088	18,481,903	1,434,564	3,679,331	48,627,720	249,146,899
16	13	2029	10,427,684	139,786,164	19,322,776	10,560,427	19,428,757	1,432,564	3,745,846	48,326,700	253,030,918
17	14	2030	10,650,214	142,222,062	19,917,669	10,616,208	20,549,470	1,388,562	3,834,927	47,962,625	257,141,737
18	15	2031	11,131,982	144,927,706	20,296,497	10,663,962	21,319,411	1,273,791	3,986,406	47,608,174	261,207,929
19	16	2032	11,307,568	147,103,540	20,941,523	10,659,722	22,433,015	1,449,210	4,057,443	47,403,611	265,355,633
20	17	2033	11,434,758	148,937,939	21,792,887	10,755,480	24,409,202	1,456,894	4,112,820	47,036,233	269,936,212
21	18	2034	11,553,320	150,902,588	22,548,591	10,861,858	25,636,129	1,427,404	4,355,183	47,062,874	274,347,947
22	19	2035	11,797,608	153,009,186	23,690,172	10,965,217	27,219,978	1,317,165	4,437,926	46,772,425	279,209,678
23	20	2036	11,975,660	155,074,505	24,772,077	10,965,148	28,300,164	1,502,364	4,488,690	47,159,732	284,238,340
24	21	2037	12,470,399	156,712,351	25,312,491	11,033,639	29,434,363	1,514,830	4,550,055	46,984,331	288,012,460
25	22	2038	12,643,773	158,161,948	26,348,360	11,066,451	30,519,268	1,508,013	4,646,579	47,334,792	292,229,183
26	23	2039	12,855,832	159,977,756	27,153,471	11,221,434	32,048,714	1,437,802	4,776,570	47,323,551	296,795,130
27	24	2040	12,925,366	161,520,669	27,962,255	11,372,108	33,645,350	1,582,986	4,825,039	47,273,930	301,107,703
28	25	2041	13,035,080	162,733,772	28,474,120	11,429,817	34,753,622	1,595,067	4,842,415	47,296,165	304,160,058
29	26	2042	13,286,239	163,891,741	29,247,153	11,513,716	36,273,374	1,608,733	5,113,749	47,374,250	308,308,955
30	27	2043	13,535,489	165,055,277	30,150,628	11,682,213	38,388,479	1,594,472	5,146,785	47,450,842	313,004,184
31	28	2044	13,719,317	166,528,298	31,105,576	11,779,166	40,042,241	1,657,268	5,216,797	47,484,063	317,532,726
32	29	2045	13,884,505	167,476,046	32,329,438	11,960,487	42,114,773	1,665,287	5,291,304	47,569,045	322,290,886
33	30	2046	14,004,893	168,308,011	33,655,223	12,092,326	43,774,649	1,689,338	5,335,788	47,662,958	326,523,186
34	31	2047	14,142,075	169,180,702	34,353,919	12,150,697	45,236,131	1,726,417	5,378,064	47,647,151	329,815,158
35	32	2048	14,391,801	170,077,730	35,606,628	12,346,080	46,836,052	1,691,308	5,391,467	47,703,092	334,044,158
36	33	2049	14,504,028	171,104,605	36,660,968	12,512,553	49,062,165	1,694,058	5,788,877	47,676,003	339,003,256
37	34	2050	14,621,788	171,571,781	37,699,919	12,652,108	51,106,813	1,718,030	5,720,573	47,761,707	342,852,718
38	35	2051	14,734,441	172,037,099	38,363,811	12,894,010	52,485,818	1,785,102	5,753,456	47,737,441	345,791,179

Table 9-10: 2015 Replacements by Account

	A	B	C	D	E	F	G	H	I	J	K
1			A	B	C	D	E	F	G	H	I
2			352	353	354	355	356	358	359	397	Total
3	1	2018	8,161,933	111,240,230	13,034,239	9,713,160	10,689,044	1,327,996	2,486,565	38,625,118	195,278,286
4	2	2019	8,323,846	114,432,327	13,522,818	9,855,544	11,233,126	1,401,923	2,694,922	41,224,204	202,688,710
5	3	2020	8,518,451	117,550,245	13,994,854	9,934,930	11,964,508	1,435,455	2,872,313	43,832,965	210,103,721
6	4	2021	8,668,853	120,126,251	14,299,003	10,042,810	12,466,549	1,414,294	2,922,508	45,246,055	215,186,322
7	5	2022	8,938,910	123,785,516	14,817,014	10,194,423	13,221,994	1,392,815	2,970,085	47,045,969	222,366,726
8	6	2023	9,145,472	126,773,171	15,533,605	10,308,418	14,508,657	1,383,800	3,048,691	48,025,187	228,727,000
9	7	2024	9,709,546	130,532,547	16,098,396	10,436,978	15,361,650	1,460,533	3,234,413	49,040,316	235,874,380
10	8	2025	9,905,151	133,149,784	17,036,548	10,495,762	16,447,258	1,447,220	3,301,663	49,412,556	241,195,942
11	9	2026	10,103,665	135,803,971	17,848,732	10,564,372	17,210,079	1,405,018	3,353,736	49,701,242	245,990,815
12	10	2027	10,219,015	139,123,070	18,248,196	10,496,669	17,999,808	1,325,426	3,644,972	49,729,698	250,786,853
13	11	2028	10,319,220	142,590,393	19,022,818	10,573,376	18,780,764	1,457,812	3,739,875	49,483,537	255,967,794
14	12	2029	10,600,166	144,737,454	19,696,677	10,734,280	19,742,957	1,455,780	3,807,798	49,188,159	259,963,271
15	13	2030	10,826,300	147,208,702	20,301,208	10,790,964	20,881,826	1,411,066	3,899,118	48,821,473	264,140,656
16	14	2031	11,315,874	149,951,755	20,686,173	10,840,073	21,664,240	1,294,456	4,053,050	48,469,567	268,275,188
17	15	2032	11,494,304	153,123,717	21,341,648	10,836,496	22,795,884	1,472,717	4,125,238	48,262,809	273,452,815
18	16	2033	11,623,555	155,052,606	22,206,804	10,933,805	24,804,086	1,480,526	4,181,512	47,896,044	278,178,937
19	17	2034	11,744,280	157,049,083	22,977,657	11,041,906	26,049,778	1,450,558	4,427,802	47,923,061	282,664,125
20	18	2035	11,993,965	159,185,732	24,137,899	11,146,940	27,659,214	1,338,577	4,511,885	47,625,898	287,600,109
21	19	2036	12,174,900	161,321,934	25,237,330	11,147,623	28,756,899	1,526,776	4,563,472	48,015,932	292,744,866
22	20	2037	12,677,654	163,955,477	25,785,436	11,218,172	29,909,472	1,539,444	4,626,327	47,834,148	297,546,132
23	21	2038	12,853,838	165,428,558	26,836,761	11,251,515	31,011,952	1,532,517	4,725,608	48,185,920	301,826,669
24	22	2039	13,069,332	167,269,883	27,727,277	11,409,009	32,566,176	1,461,236	4,857,704	48,170,908	306,531,525
25	23	2040	13,140,307	168,872,308	28,549,163	11,562,123	34,188,677	1,608,772	4,906,959	48,114,975	310,943,285
26	24	2041	13,253,663	171,030,279	29,069,321	11,620,767	35,314,903	1,621,048	4,924,616	48,134,767	314,969,364
27	25	2042	13,508,890	172,207,007	29,854,876	11,706,968	36,859,275	1,634,936	5,200,345	48,208,917	319,181,215
28	26	2043	13,762,178	173,385,777	30,772,987	11,879,379	39,008,644	1,620,525	5,233,917	48,285,336	323,948,743
29	27	2044	13,948,985	174,877,013	31,747,765	11,977,903	40,686,463	1,684,339	5,305,745	48,315,441	328,543,654
30	28	2045	14,116,849	176,681,396	32,991,703	12,162,161	42,792,395	1,692,487	5,383,100	48,402,089	334,222,180
31	29	2046	14,239,187	177,578,657	34,338,966	12,296,135	44,479,162	1,716,928	5,428,304	48,496,321	338,573,659
32	30	2047	14,378,985	178,465,485	35,047,388	12,356,607	45,964,320	1,754,682	5,471,265	48,482,036	341,920,768
33	31	2048	14,635,086	179,373,784	36,318,404	12,556,608	47,590,159	1,719,004	5,484,885	48,540,196	346,218,127
34	32	2049	14,749,132	180,444,050	37,498,365	12,725,777	49,852,335	1,721,798	5,888,733	48,515,199	351,395,390
35	33	2050	14,868,799	181,689,619	38,554,148	12,867,593	51,930,107	1,746,159	5,819,323	48,605,364	356,081,112
36	34	2051	14,983,277	182,162,476	39,228,795	13,113,414	53,331,452	1,814,363	5,852,739	48,582,976	359,069,492
37	35	2052	15,162,319	182,589,144	40,068,668	13,224,136	54,750,445	1,699,491	5,927,307	48,634,536	362,056,045

10. FINANCIAL RISK AND MITIGATION

10.1 Transmission Risk Analysis Model

The foundation of the risk analysis is a transmission financial spreadsheet model. This Excel spreadsheet, the Transmission Risk Analysis Model (TRAM), was developed to estimate the effects of risk and risk mitigation on end-of-year financial reserves and the likelihood of successful U.S. Treasury payment during the rate period. Levels of financial reserves available for risk attributed to Transmission (TS Reserves) at the end of a fiscal year determine whether BPA is able to meet its U.S. Treasury payment obligation in that year. The model is a workbook with individual worksheets including an input matrix of revenues and expenses, an income statement, a cash flow statement, and worksheets for the risks assessed in the model.

TRAM is a Monte Carlo model that produces 3,200 iterations of its calculations. Randomly sampled sets of input values are drawn for each game in a Monte Carlo simulation process that involves computing results of large numbers of games in order to create a probability distribution of outcomes, such as net revenues or TS Reserves. In each game (sometimes called an iteration) the simulation of ending TS Reserves starts with historical data on TS Reserves at the end of FY 2014 (which is the amount of reserves at the beginning of FY 2015). Cash flow (year-to-year change in TS Reserves) for FY 2015 is built on the values from the Income and Cash Flow Statements in the Transmission Revenue Requirement Study, and is modified by drawing randomly from probability distributions over possible values of the risk variables defined in TRAM.

The structure of the income statement and cash flow statement used in the risk analysis is similar to the structure of the statements contained in the Transmission Revenue Requirement Study. The cash flow, added to the start-of-year TS Reserves balance, yields the year-end TS Reserves balance. This flow of computations is repeated sequentially for each year from FY 2015 through FY 2017.

Simulating transmission cash flows in this manner allows creating a distribution of FY 2016 start-of-year TS Reserves instead of defining FY 2016 start-of-year TS Reserves as a deterministic input value. (A deterministic value is a single-point estimate that does not reflect any uncertainty about the actual value that will be realized later.) The model forecasts the start-of-year FY 2016 TS Reserves based on transmission function historical cash flows, current forecasts of expenses and revenues, and the uncertainty in expenses and revenues explicitly modeled for FY 2015. The “most-likely” forecasts are equal to the mode or peak of the underlying probability distribution for uncertain variables. The most-likely forecast will also equal the expected value (sometimes referred to as the mean) when the underlying distribution is symmetric or the value is a single point estimate. However, in some cases the most-likely forecast is greater or less than the expected (or mean) value because the underlying uncertainty distribution is not symmetric.

10.2 Risk Analysis Computer Software

The model used to perform the risk analysis was developed with Excel® and @RISK Professional version 5.5 and 6.0 (®Palisade Corporation). Excel is a spreadsheet computer

program, and @RISK is an Excel® add-in computer program available from Palisade Corporation. The @RISK software allows analysts to develop spreadsheet models that incorporate uncertainty. Uncertainty is incorporated by describing variables of interest as probability distributions over possible values that the variables can take. @RISK samples values from the probability distributions in each game, and then carries out the spreadsheet computations, producing different results for each game. While @RISK provides tools that enable users to turn spreadsheet models into Monte Carlo simulation models, the users still must determine the input probability distributions for the uncertain variables in the model. This is done in analyses external to Excel® and @RISK®.

10.3 Revenue Risk

Revenue risk is one of the uncertainties for which BPA determines probability distributions for use in TRAM. The amount of revenue earned during the rate period can vary from the revenue forecast due to uncertainty in the quantity of each service sold. To capture the total transmission revenue variability, BPA models revenue drivers and the resulting revenue risk for each transmission revenue segment: Network, Intertie, Ancillary Services, and Other Revenues & Credits. The Network comprises Network Integration (NT), long-term Point-to-Point (PTP LT) and short-term Point-to-Point (PTP ST). The Intertie segment comprises long-term Southern Intertie (IS LT) and short-term Southern Intertie (IS ST). The Other Revenues segment comprises Delivery, Fiber & PCS Wireless, and Other Revenues. The Ancillary Services segment comprises Scheduling, System Control and Dispatch (SCD), and Generation Inputs. BPA models revenue risk based on the risk variables discussed below, and determines the revenue risk distribution and the expected value of revenue by running 3,200 revenue forecasting games using Excel® and @RISK.

10.3.1 Network Integration Service (NT) Revenue Risk

Risks in the NT revenue forecast arise from uncertainty in the load forecast, which is the basis for the NT sales and revenue forecast. The load forecast is based on predicted year-to-year NT load growth; actual loads can vary from the forecast because economic conditions are different from those forecast and because load center temperatures are different from the normal temperatures on which the forecast is based. Risk in the growth rate is modeled with a triangular risk distribution defined by a high value, a low value, and a most-likely value, or mode. The most-likely value is the forecast rate of year-to-year load growth. The high value is an optimistic load growth rate that serves as the 80th percentile of the triangular distribution, and the low value is a pessimistic load growth rate that serves as the 20th percentile of the distribution.

The optimistic load growth rate is determined by adding the predicted year-to-year NT load growth rate to an optimistic forecast of Gross Domestic Product (GDP) obtained from IHS Global Insights, an economic forecasting and analysis firm. Similarly, the pessimistic load growth rate is determined by adding the predicted year-to-year NT load growth rate to a pessimistic GDP forecast obtained from IHS Global Insights. The resulting distribution around growth rate serves as the first component of NT revenue risk.

The impact of temperature variability on the load is also modeled. The load forecast is based on normalized temperature, so the risk arises from the variability of load center temperatures.

Variability in these temperatures induces variability in the load. The distribution of temperatures in a 30-year period follows a normal distribution (a bell curve symmetrical around the mean) calculated from historical temperatures.

The NT revenue risk distributions have standard deviations of \$3.9 million for FY 2016 and \$4.2 million for FY 2017.

10.3.2 Long-Term Network Point-to-Point Service (PTP) Revenue Risk

Risks in revenue from long-term PTP service are related to assumptions about new service and potential deferrals of the service commencement date, exercise of renewals under BPA's Open Access Transmission Tariff (OATT), conversions of Formula Power Transmission (FPT) and Integration of Resources (IR) service to PTP service, and possible customer default. BPA also models revenue risk related to service that has not been granted yet, but that might be granted during the rate period.

BPA models risk for forecast revenue from new transmission service (that is, service that has been offered to customers but has not yet begun) because the customer has a right to defer the service commencement date for up to five years. A deferral delays the revenue from that service for the period of the deferral. The revenue risk associated with deferrals is based on a comparison of the service commencement date on the service reservation to the probable service commencement date after deferrals. BPA identifies possible deferrals by determining whether the service appears to be related to a Large Generator Interconnection Agreement (LGIA). If the generation in-service date has been forecast, then risk around the forecast LGIA generation in-service date is modeled using a triangular distribution, which is defined by maximum, most-likely, and minimum values. The transmission service commencement date is assumed to match the risk-adjusted generation in-service date (that is, the analysis assumes the customer would defer its transmission service commencement date to match the generation in-service date). If the generation in-service date has not been forecast, the risk of deferral is identified based on information from BPA's account executive for the customer. The likelihood of deferral is based on the account executive's level of confidence that the request will begin on its current service commencement date.

BPA also models risk associated with revenue from new service to be offered as a result of new infrastructure. During the rate period two Network Open Season infrastructure projects are forecast to be completed (Big Eddy-Knight and Central Ferry-Lower Monumental). A PERT distribution (a distribution in which the user defines the maximum, most-likely, and minimum values) is used to model possible delays to the in-service date for these projects (and resulting delays in the start of service and receipt of revenue). For Big Eddy-Knight, risk of a delay up to one year was modeled. For Central Ferry-Lower Monumental, a delay of up to two years was modeled.

Risk is also modeled for service that is eligible to be renewed during the rate period. Historical data was gathered on the frequency of renewal of long-term PTP service for service reservations that have been eligible for renewal over the past five years. A normal distribution was identified using the historical frequency of renewals for service requests that are eligible for renewal. That

distribution is applied to the service requests that are eligible for renewal during the rate period to identify the probability of the service being renewed.

Risk is modeled for service that is eligible to convert from FPT or IR service to PTP service by gathering information from BPA's account executives for the customers on the likelihood that individual requests will convert either after the expiration or prior to the expiration of the FPT or IR contract. The likelihood of conversion is based on the account executives' level of confidence that the request will convert to PTP service during the rate period.

Risk of default is modeled for all current and anticipated service. The probability of default for each customer is modeled using information from Standard & Poor's. BPA applies Standard & Poor's credit rating for each entity and refers to Standard & Poor's Global Corporate Average Default Rate for the level of default risk associated with that credit rating. Standard & Poor's conducts its default studies on the basis of groupings called static pools. Static pools are formed by grouping issuers by rating category at the beginning of each year covered by the study. Annual default rates were calculated for each static pool: first in units and later as percentages with respect to the number of issuers in each rating category. Finally, these percentages were combined to obtain cumulative default rates for the 30 years covered by the study. If a default occurs in the model, we assume that the capacity held by the defaulting customer returns to inventory and is resold for a portion of the remaining months of the fiscal year. Assuming the capacity is resold for only a portion of the year accounts for the time it takes to process and offer the new contract for the service.

Risk associated with additional sales of service that have not yet been requested (the possibility that revenues will be higher than forecast due to these sales) is modeled based on three different sources: new sales associated with new generation that is included in the LGIA forecast but for which long-term service has not yet been requested, new sales from transmission inventory that becomes available due to customer default, as described above, and new sales as a result of competitions performed in accordance with section 17.7 of the OATT (deferral competitions). Sales due to new generation are modeled using a PERT distribution and information from TS's customer service engineering on expected in-service dates. Modeling of sales from inventory that becomes available due to customer default is described above. To model sales that occur after competitions, it is assumed that zero to six competitions will be performed a year. For each competition performed there is a 50 percent chance that the competition will be successful and result in additional revenue.

The long-term PTP revenue risk distribution results in standard deviations of \$11.0 million for FY 2016 and \$12.5 million for FY 2017.

10.3.3 Short-Term Network Point-to-Point Service Revenue Risk

The short-term PTP revenue forecast carries significant risk due to the nature of the product. This service is not reserved far in advance with an existing contract, but instead is requested on an hourly, daily, weekly, or monthly basis. Short-term PTP service is sensitive to market conditions and streamflow, so we model the risks around the NP-15 minus Mid-C price spread, and streamflow. To model risk around the Mid-C and NP-15 prices we incorporate variability around natural gas prices and streamflow. Natural gas volatility is important because natural

gas-fired electricity generation is often the marginal resource in western power markets, and therefore plays an important role in setting the market price of power. Fluctuations in natural gas prices lead to fluctuations in power prices. We use the natural gas volatility documented in the Power Risk and Market Price Study to model this risk. BP-16-E-BPA-04, § 2.3.1

Streamflow variability is important for two reasons. First, the Mid-C and NP-15 price spread is positively correlated with streamflow. As streamflow increases, Mid-C prices decrease and the price spread widens. Second, streamflow has a high correlation with short-term transmission reservations made by BPA Power Services. The short-term PTP forecast is developed using a regression analysis, so we also modeled risk of errors in correlation identified between historical sales, streamflow, and price spread. For a more in-depth discussion on the short-term PTP forecast and risk assessment process, see the Transmission Rates Study and Documentation. BP-16-E-BPA-07, § 2.2.2.2. The short-term PTP risk distribution resulting from the methodology outlined above results in standard deviations of \$13.0 million for FY 2016 and \$13.0 million for FY 2017.

10.3.4 Long-Term Southern Intertie Service Revenue Risk

Capacity for long-term service on the Southern Intertie is fully subscribed, meaning that the capacity is completely sold out. In addition, there is a queue of transmission service requests that are seeking long-term Southern Intertie service but that have not been granted service because no long-term Southern Intertie capacity is available for sale. Uncertainties in the revenue forecast are based primarily on transmission service contracts that will expire during the rate period and do not have service renewal rights. Requests in the queue are expected to replace any contracts that expire. Thus, we identified a high service commencement probability, with a normal distribution, for these requests. In addition, we model default risk for service on the Southern Intertie using the same method described for long-term PTP service. The long-term Southern Intertie risk distribution results in standard deviations of \$1.8 million for FY 2016 and \$2.5 million for FY 2017.

10.3.5 Short-Term Southern Intertie Service Revenue Risk

The revenue forecast for short-term Southern Intertie service carries significant risk due to the nature of the product. This service is not reserved far in advance with an existing contract, but instead is requested on an hourly, daily, weekly, or monthly basis. Short-term Southern Intertie service is sensitive to market conditions and streamflow, so BPA models the risks around the NP-15 minus Mid-C price spread, and streamflow. The forecast is developed using a regression analysis, so BPA also models risk of errors in correlations identified between historical sales, streamflow, and price spread. For a more in-depth discussion on the short-term IS forecast and risk assessment process, see the Transmission Rates Study and Documentation. *Id.* § 2.3.1.2. The short-term Southern Intertie revenue risk distribution results in standard deviations of \$1.4 million for FY 2016 and \$1.5 million for FY 2017.

10.3.6 Other Transmission Revenue Risk

The risk related to other transmission revenues arises from variability in Utility Delivery and DSI Delivery revenues, revenues from fiber and wireless contracts, and revenues from other fixed-price contracts. This risk is modeled based on the historical variance between rate case revenue

forecasts for these products and actual revenue. Data from FY 2006 through FY 2014 is used and a normal distribution is applied, resulting in a standard deviation of \$0.5 million per year for Utility and DSI Delivery revenue, \$1.2 million per year for fiber and wireless contract revenue, and \$2.7 million per year for other fixed-price contract revenue.

10.3.7 Ancillary and Control Area Services Revenue Risk

BPA models the revenue risk associated with the ancillary service Scheduling, System Control, and Dispatch (SCD), which applies to customers taking both firm and non-firm transmission service. SCD revenue is based on sales of NT, long-term PTP, short-term PTP, long-term IS, and short-term IS. As such, the revenue variability for SCD follows the risk associated with those services, and SCD revenue risk is not modeled individually. Instead, variations in SCD revenues are assumed to be directly proportional to variations in the revenue from those services.

BPA does not model revenue risk associated with the Ancillary Service Reactive Supply and Voltage Control from Generation Sources (GSR) because that rate is a formula rate that is currently set at zero. As a result, it generates no revenue. The formula rate for GSR is calculated for each quarter but has been calculated to be zero in every quarter since 2009.

Generation Inputs services comprise Regulation & Frequency Response (RFR), Dispatchable Energy Resource Balancing Service (DERBS), Variable Energy Resource Balancing Service (VERBS), Energy & Generation Imbalance (EI/GI), and Operating Reserve – Spinning & Supplemental (OR). We sorted these sources of revenue into three categories based on their characteristics and their impact on TS net revenue: 1) variable revenue but fixed expense, 2) essentially fixed revenue and expense, and 3) equivalent variability in both revenue and expense.

TS pays PS a fixed amount for RFR and DERBS during the rate period. The revenue that TS charges to its customers, however, is variable, so the contribution to TS net revenue is variable. For RFR the billing factor is customers' loads in the BPA balancing area. As such the billing factor is variable due to factors that include weather variation from normal and changes in economic conditions. The standard deviation of historical billed RFR loads from FY 2008 through FY 2014 is used in the simulation of the load and associated revenue during the rate period. The resulting variability on revenues for RFR is \$0.7M. DERBS is based on the station control error of non-Federal thermal plants. Station control error is the deviation of a generator from its basepoint, which is the generation level to which the plant is planned to operate. The historical standard deviation of the station control area for DERBS plants for INC and DEC reserves is used in simulating DERBS revenue. The resulting variability on revenues for DERBS is \$0.4M.

Generation inputs whose revenues and expenses are essentially fixed create no uncertainty in TS net revenue. VERBS is the only generation inputs service in this category. Generation inputs whose revenues and expenses are equally variable and perfectly correlated, that is, any potential change in TS revenue is matched by an equal offsetting change in TS expense, also create no uncertainty in TS net revenue. This category comprises EI/GI and OR. No uncertainty in revenue from VERBS, EI/GI or OR is modeled.

10.3.8 Total Transmission Revenue Risk

The Transmission Revenue Risk worksheets compute the revenue risk and the resulting expected value for transmission revenues from these products. The revenue uncertainty from all transmission services is aggregated; the variability of the total transmission revenues (as measured by the standard deviation) is less than the sum of the variabilities (standard deviations) of the individual services. The standard deviation of the distribution of total transmission revenue for the FY 2016 is \$22.6 million and for FY 2017 is \$24.0 million. In each game, the total transmission revenue is linked into the income statement in TRAM (worksheet “TS IS”).

10.4 Expense Risk

The following expense items were modeled probabilistically in TRAM:

1. Transmission Operations
2. Transmission Maintenance
3. Agency Services General & Administrative
4. Interest on Long-Term Debt Issued to the U.S. Treasury
5. Transmission Engineering

To obtain the data used to develop the probability distributions used by TRAM for these items, BPA analyzed historical data and consulted with subject matter experts for their assessment of the risks concerning their cost estimates, including the possible range of outcomes and the associated probabilities of occurrence.

10.4.1 Transmission Operations

TRAM models variability in transmission operations expense using PERT distributions for FY 2015 and for each of the two fiscal years in the rate period, FY 2106 and FY 2017. (Again, a PERT distribution is a distribution in which maximum, most-likely (mode), and minimum values are defined for the distribution.) For FY 2015, the most-likely value comes from the start-of-year budget. For the rate case years, the most-likely values come from the revenue requirement. The minimum and maximum values of the distribution come from the historically observed minimum and maximum actual values (from FY 2009–2013) compared to rate case projections. The minimum value is 8.7 percent lower than the level of expense in the revenue requirement; the maximum value is 15.5 percent higher than the expected level of expense in the revenue requirement. The resulting standard deviation of transmission operations expense is \$7.1 million per year.

10.4.2 Transmission Maintenance

To model variability in transmission maintenance expense, PERT distributions are used for FY 2015 and for each of the two fiscal years in the rate period. For FY 2015, the most-likely value comes from the start-of-year budget. For the rate case years, the most-likely values come from the revenue requirement. The minimum and maximum values of the distribution come from the historically observed minimum and maximum actuals values (from FY 2009–2013) compared to rate case projections. The minimum value is 10.2 percent lower; the maximum value is 26.3 percent higher. The resulting standard deviation of transmission maintenance expense is \$10.8 million each year.

10.4.3 Agency Services General & Administrative

To model variability in agency services general and administrative (G&A) costs, PERT distributions are used for FY 2015 and for each of the two fiscal years in the rate period. For FY 2015, the most-likely value comes from the start-of-year budget. For the rate case years, the most-likely values come from the revenue requirement. The minimum and maximum values come from the historically observed minimum and maximum actuals values (from FY 2009–2013) compared to rate case projections. The minimum value is 20.7 percent lower; the maximum value is 18.1 percent higher. The resulting standard deviation of G&A expense is \$6.3 million each year.

10.4.4 Interest on Long-Term Debt Issued to the U.S. Treasury

TRAM models the impact of interest rate uncertainty associated with new debt issuances (borrowings) on interest expense and on TS Reserves. For FYs 2015, 2016, and 2017 the amounts of planned new borrowing are \$609 million, \$598 million, and \$545 million respectively (table 11-2). These planned borrowings and the official interest rates included in chapter 6 are used to calculate anticipated interest expense on long-term debt for the revenue requirement (Transmission Revenue Requirement Study, BP-16-E-BPA-08, table 11-2). This analysis assesses the potential difference between actual interest expenses and the interest expenses included in the revenue requirement.

For each fiscal year, new borrowings are planned on a monthly basis, and are for different amounts each month, and with different term lengths (this documentation, table 11-2). For example, in March of 2015, there are two planned borrowings, for \$56 million and \$1.3 million, at planned borrowing terms of 10 and six years and interest rates of 3.54% and 2.53% respectively (table 11-2). TRAM models uncertainty in the interest rate BPA will eventually receive when these borrowings occur, but the analysis does not model uncertainty in the amount borrowed, term length of the borrowing, or timing of the borrowing.

TRAM uses a historical database of interest rates as the basis to forecast future uncertainty in interest rates. We generated the database from 21 years of historical daily data (1994 to 2014) that includes each interest rate term (for example one year, two year ...thirty year) for U.S. Agency interest rates (the rate BPA borrows at for Federal borrowings – data source - Bloomberg Curve CO843) and a taxable interest rate index for AA rated utilities (a proxy for the rates BPA borrows for third-party lease financing [Lease Financing], that is, financing BPA obtains from the private sector – Bloomberg Curve 903M). To model the interest expense uncertainty in TRAM, for each game we randomly select a starting date from the historical data set and obtain the interest rate for each term length on the yield curve (for example, one-year interest rate, two-year rate, up to the 30-year rate) on that date. Then we obtain the interest rate for each term length on the yield curve for the date 30 days later. We repeat this process, sampling the interest rates each 30 days, for three years and one month following the starting date, so that we end up with 37 interest rate data points for each term length (37 data points are needed because there are twelve 30-day periods in a year; 12 multiplied by three years is 36; and we need an extra month to capture 36 month-to-month returns, or month-to-month changes). We do this separately for Agency interest rates and for the AA Utility Taxable interest rates (AA Taxable).

We measure the monthly returns by taking the log return, also known as geometric return, which is the natural logarithm of the interest rate from one month less the natural logarithm of the interest rate of the prior month. Monthly returns are calculated for each interest rate product (Agency and AA Taxable), for each term length of that product and for each thirty-day period for a full three years from the sample starting date. We use the 3,200 calculated monthly returns to create three-year projections of interest rates for each term length and for each interest rate product, all of which start from BPA's official starting interest rates in FY 2015 (chapter 6).

For example, assume the sample starting date selected for game one is June 5, 2001. The interest rate for the Agency product with a 10-year term, in the first month of the 36-month projection, is equal to the FY 2015 Agency 10-year interest rate from the official forecast (3.54 percent, *id.*) multiplied by the calculated return from June 5, 2001 to July 5, 2001 (June 5, 2001 10-year Agency interest rate = 6.02 percent, July 5, 2001 10-year Agency interest rate = 6.19 percent, the log return equals 1.2094 percent ($\log(6.19)$ less $\log(6.02)$). Taking the exponent of the log return yields 1.012168, which is the appropriate factor by which to multiply 3.54 percent to get a projection for one month later of the 10-year Agency interest rate for game one, 3.583 percent. To generate the month two projection of the 10-year Agency interest rate for game one, we take the calculated rate from month one, 3.583 percent, and multiply it by the sampled return from August 5, 2001 to July 5, 2001. For the full projection, we repeat the process for all 36 months for each term length on the yield curve and for each interest rate product. In the second game, a new sample starting date is selected from the 20-year dataset, and the process is repeated, but using a different three-year historical window within the dataset.

We run 3,200 games using this methodology, and thus generate 3,200 projections of each term length for each interest rate product. We adjust each projection by the same amount to adjust the average 2017 interest rate from the set of 3,200 games to match the interest rate in BPA's official 2017 interest rate forecast (chapter 6). Thus, this analysis captures the month-to-month uncertainty around the interest expense in the revenue requirement but does not adjust the expected value itself, which was determined in BPA's official interest rate forecast.

We then combine interest rates from each projection with the corresponding timing and term length of anticipated monthly borrowings in the repayment study to generate 3,200 projections of interest expense (50 percent of each anticipated borrowing in the repayment study is assumed to be financed at the simulated Agency rate and 50 percent at the AA Taxable Utility rate, in line with common agency assumptions of 50 percent lease financing of the transmission capital program). Finally, we incorporate these 3,200 projections of interest expense into the 3,200 games in TRAM. That is, for each game in TRAM, the modeled interest expense on new borrowings replaces the portion of interest expense on long-term debt related to new borrowings from the revenue requirement (Transmission Revenue Requirement Study, BP-16-E-BPA-08, table 3). The resulting standard deviations of interest expense for long-term debt are \$2.2 million in FY 2016 and \$4.3 million in FY 2017.

10.4.5 Transmission Engineering

To model variability in transmission engineering expense, PERT distributions are used for FY 2015 and for each of the two fiscal years in the rate period. For FY 2015, the most-likely

value comes from the start-of-year budget. For the rate case years, the most-likely values come from the revenue requirement. The minimum and maximum values of the distribution come from the historically observed minimum and maximum actuals values (from FY 2009–2013) compared to rate case projections. The minimum value is 25.1 percent lower; the maximum value is 23.6 percent higher. The resulting standard deviation of transmission maintenance expense is \$5.0 million each year.

10.5 Cash Timing Lags

TRAM uses projections of revenues and expenses to estimate possible changes in TS Reserves. A projected revenue or expense is a projection of when accounting will record that a service has been performed by BPA (revenue) or that a service has been received by BPA (expense). The projection of when accounting records a revenue or expense is typically within one month of when the cash is received or paid. For most revenues and expenses, we start by assuming that cash is received or paid in the same year as the revenue or expense is recorded, unless we know the revenue or expense has no cash associated with it (that is, it is a non-cash revenue or non-cash expense). We remove these known non-cash revenues and non-cash expenses from the forecast. As we project revenue and expenses for each game in TRAM, we model uncertainty in the timing of when the cash will be received or paid.

For revenues or expenses projected to be recorded by accounting near the end of a fiscal year, there is a potential for the cash transaction to lag sufficiently far behind the accounting transaction that the cash will be received or paid in the following year. If some cash receipts from revenue lag into the next year, TS Reserves at the end of the year will be lower than otherwise, and if some cash payments for recorded expenses lag into the next year, TS Reserves at the end of the year will be higher than otherwise. Timing differences of this kind can be observed in historical data by looking at the year-over-year changes to the accounts payable, accounts receivable, materials, and prepaid expense accounts. These accounts represent revenues or expenses BPA has recorded from an accounting standpoint but for which BPA has not yet received or paid cash.

To model this uncertainty, we looked at the change in BPA's accounts payable (both Power and Transmission), accounts receivable, materials, and prepaid expenses from 2009 to 2014. We assumed that the percentage of each account that is attributed to Transmission Services equaled the percentage of BPA's total revenues that is earned by Transmission Services. Thus, since transmission revenue was 29 percent of total FCRPS revenue in every year of the historical period except one, when it was 28 percent, we assumed that 29 percent of these accounts were attributable to Transmission Services in all years but one, and 28 percent in the other year. For FY 2014 to FY 2009, the changes in accounts payable, accounts receivable, materials and prepaid expenses attributed to Transmission Services were \$8.2 million, \$10.3 million, \$7.4 million, -\$18.5 million, \$14.9 million, and -\$32.1 million respectively. The average over the period was -\$5 million and the standard deviation was \$18.3 million. Over many years the average will be very close to \$0, because the changes to these accounts are merely timing differences between when revenue and expenses are accounted for and when the cash is received or paid. The historical data show that over time, increases in one year are offset by decreases in another.

For example in FY 2014, the change in accounts payable, accounts receivable, materials, and prepaid expenses was \$8.2 million, in FY 2013 it was negative -\$10.3 million, and the trend continues through FY 2009. We modeled the variability in cash timing lags in TRAM in FY 2015 – FY 2017 with a normal distribution (bell-shaped curve), average of \$0 (theoretical long-run average) and standard deviation of \$18.3 million (observed standard deviation). This means that on average the cash timing lag will be \$0, but has the potential to vary on either side of \$0. Two thirds of the time the cash lag will be within the range of positive and negative \$18.3 million. Because the FY 2014 actual amount was positive we assumed the FY 2015 amount would be negative, FY 2016 amount positive, and FY 2017 amount negative, reflecting the offsetting relationship of these amounts year over year. In each TRAM game, we sampled three values from the earlier-described normal distribution for FY 2015, FY 2016 and FY 2017 and converted the sampled value to the appropriate positive or negative sign if it wasn't the appropriate sign already. The analysis resulted in an average cash lag in FY 2016 and FY 2017 of -\$2 thousand and standard deviation of \$15.4 million.

10.6 Within-year Liquidity Need

The within-year liquidity need is the amount of cash or other liquidity (the temporary availability of cash) BPA needs at the beginning of a fiscal year for dealing with cash flow deficits that result from payments being made before cash receipts. The transmission business unit has over \$900 million in annual expenses. Debt service payments and revenue receipts are the primary drivers of monthly surplus or deficit in TS's cash flow. In the 2002 transmission rate case, BPA determined that its within-year liquidity need for TS was \$20 million. This means that BPA determined that, after all expenses are paid at the end of a year, including the Treasury payment, it needed to have at least \$20 million of liquidity on hand for use during the next fiscal year in the event cash disbursements were made in advance of cash receipts. BPA has made the same assumption in each rate case since then, until now. TRAM records a Treasury payment miss (that is, TRAM assumes that BPA is unable to make its Treasury payment) if TS Reserves in a game are below the within-year liquidity need at the end of either year in the rate period.

For this rate case, we reexamined the within-year liquidity need. We calculated monthly changes in historical (FY 2010–2014) TS Reserves (TS monthly cash flow) by taking the difference between one month's ending balance and the following month's ending balance. Then we divided the monthly cash flow into two parts: within-year cash flow and strategic cash flow. Within-year cash flow represents the timing difference between when cash is received or paid. It is not a result of permanent gains or losses but instead temporary gains or losses in cash that are largely a function of timing differences in the receipt and disbursement of cash. The annual within-year cash flow is assumed to be \$0.

Strategic cash flow represents more or less permanent gains or losses in TS Reserves. Annual strategic cash flow is calculated by taking the year-over-year increase or decrease in TS Reserves. Monthly strategic cash flow is approximated as 1/12 of the annual amount. Cumulative total cash flow in a given month (the sum of year-to-date total cash flows) less cumulative strategic cash flow (the sum of year-to-date strategic cash flows) results in year-to-date within-year cash flow.

Consider an example in which TS had \$0 in TS Reserves at the start of a fiscal year, but gained \$120 million over the course of that year. Annual strategic cash flow was \$120 million, and the approximation of monthly strategic cash flow is \$10 million, one twelfth of the annual amount. Suppose the total cash flow in the first month of the year was \$8 million, that is, TS Reserves after one month were \$8 million higher than at the start of the year. In the first month, total cumulative cash flow was \$8 million, and total cumulative strategic cash flow was \$10 million. , thus cumulative within-year cash flow at this point was -\$2 million. Even though TS gained \$10 million in strategic cash flow in the first month, within-year cash flow after one month was negative. The negative within-year cash flow will turn positive in a future month when receipts are higher and disbursements lower.

Negative cumulative within-year cash flow requires a use of liquidity, specifically what we term within-year liquidity, in order to be able to make cash disbursements until the timing of receipts and disbursements evens out. We found from the historical data that the annual maximum amount of within-year liquidity used was significantly greater than \$20 million in three of the five years. The maximum for FYs 2010 through 2014 was \$96 million, \$11 million, \$17 million, \$30 million, and \$61 million respectively. Because the purpose of retaining within-year liquidity is to ensure that sufficient liquidity is available in every year, the maximum historical value is appropriate as an indicator of the required amount. Thus, we concluded that the within-year liquidity need for Transmission Services is \$100 million (the highest figure rounded to the nearest \$10 million) rather than \$20 million. For the BP-16 rate period, we propose to meet this need with \$100 million in TS Reserves.

10.7 Risk Analysis Results

The transmission risk analysis simulation resulted in 3,200 games out of 3,200 in which end-of-year TS Reserves were sufficient to pay the U.S. Treasury on time and in full in the FY 2016–2017 rate period. This TPP for the BP-16 rate period is above 99.9 percent.

10.8 TS Reserves and PNRR

The expected values of year-end TS Reserves for FY 2015, 2016, and 2017 are \$446 million, \$417 million, and \$360 million, respectively. Since the TPP is above 95 percent for the rate period, no PNRR was needed.

	B	C	D	E	F	G	H							
1	Table 10-1: TRAM TPP Calculation													
2								(\$000s)						
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	A	B	C
	FY 2015	FY 2016	FY 2017
Starting Reserves for Risk	510,900	445,997	416,987
Revenues	1,026,306	1,078,112	1,090,802
VERBS Net Revenue Deviations	-	-	-
Expenses	(948,454)	(998,607)	(1,033,691)
Game specific Interest Credit Adjustment	643	1,722	1,767
Adjusted Net Revenue	78,494	81,227	58,878
Total Expenses Not Requiring Cash	156,193	194,628	195,252
Cash Used for Capital Investment	(639,534)	(658,667)	(576,229)
Cash From Borrowing and Appropriations	339,944	353,802	264,593
Net Revenue-to-Cash Adjustment	(143,397)	(110,237)	(116,384)
Net Adjusted Cash Flow	(64,903)	(29,010)	(57,506)
Additional Use of Reserves	-	-	-
Ending Reserves for Risk	445,997	416,987	359,481
Required EOY Within-Year Liquidity Reserves	100,000	100,000	100,000
Count TPP Misses	0	0	0
TPP % (3200-Misses/3200)	100%	100%	100%

	B	C	D	E	F	G
1						
2			Table 10-2: TRAM TPP Calculation			
3			(\$000s)			
4				A	B	C
5				FY 2015	FY 2016	FY 2017
6			Total Operating Revenues (Excl. Reimbursable)	1,026,306	1,078,112	1,090,802
7						
8			VERBS Net Revenue Deviations	-	-	-
9						
10			Operating Expenses			
11			Transmission Operations	145,847	157,041	162,629
12			Transmission Maintenance	165,321	166,902	168,669
13			Transmission Engineering	63,008	54,284	54,777
14			Trans Services Transmission Acquisition and Ancillary Services	134,793	140,767	140,782
15			Transmission Reimbursable	10,745	-	-
16			Agency Services G&A	85,410	84,734	86,534
17			Other Income, Expenses & Adjustments	-	(2,100)	(2,100)
18			Other	-	-	-
19			Total Transmission Operating Expense	605,124	601,626	611,292
20						
21			Net Operating Margin	421,182	476,486	479,511
22						
23			Federal Projects Depreciation	223,380	239,852	259,210
24						
25			Total Operating Expense & Depreciation	828,504	841,479	870,502
26						
27			Net Operating Revenue	197,802	236,633	220,300
28			Interest on Appropriated Funds	14,514	14,418	8,351
29			Capitalization Adjustment	(18,968)	(18,968)	(18,968)
30			Interest on Long-Term Debt Issued to Treasury	92,984	127,734	152,725
31			Amortization of Capitalized Bond Premiums	-	561	561
32			Debt Reassignment Interest Expense	35,053	31,431	23,072
33			Interest on Customer Advances	8,823	-	-
34			AFUDC	(49,000)	(40,657)	(40,446)
35			Non Federal Interest	44,000	52,170	53,032
36			Interest Credit on Financial Reserves	(7,455)	(9,560)	(15,137)
37			Net Interest Expense	119,950	157,128	163,189
38						
39			Total Operating & Net Interest Expenses	948,454	998,607	1,033,691
40						
41			Simulation NR delta from point estimates	(14,439)	(30,472)	(29,704)
42						
43			Net Revenues	77,851	79,505	57,111

	B	C	D	E	F	G	H
3							
4				Table 10-3: TRAM TPP Calculation			
5				(\$000s)			
6					A	B	C
7					FY 2015	FY 2016	FY 2017
8				Cash Provided by Current Operations			
9				Adjusted Net Revenues	77,851	79,505	57,111
10				Expenses not Requiring Cash			
11				Depreciation/Amortization	223,380	239,852	259,210
12							
13				Amort of Capitalized Bond Premiums	-	561	561
14				Capitalization Adjustment	(18,968)	(18,968)	(18,968)
15				Cash flow adjustment (reserve)/application	-	-	-
16				Cash lag from FY14	(14,612)	14,603	(14,607)
17				Avista Settlement & B2H Cash Payments	-	-	-
18				Revenue Recognition AC Intertie/Fiber	(3,065)	(6,853)	(6,853)
19				Revenue Recognition (Fiberoptics)	(3,535)	-	-
20				MBS interest accrual net of cash received	-	-	-
21				Fiber Lease Pre Pay	-	-	-
22				Transmission Credit Projects Net Interest (see Int on LGIA...	8,823	4,326	4,252
23				Accrual Revenues (LGIA)	(35,830)	(38,893)	(28,343)
24				Cash Provided by Current Operations	234,045	274,133	252,363
25				Cash Used for Capital Investments			
26				Investment in			
27				Gross Utility Plant and CWIP	(639,534)	(658,667)	(576,229)
28				Cash Used for Capital Investments	(639,534)	(658,667)	(576,229)
29				Cash From Borrowing and Appropriations			
30				Cash from Borrowing & Appropriations	624,534	643,667	561,229
31				DSR Principal Repayment	(185,173)	(185,303)	(199,991)
32				Repayment of Long-term Debt (Plus Advanced Refunding)	-	(1,392)	(1,585)
33				Repayment of Long-term Debt	(1,298)	(19,500)	(40,950)
34				Repayment of Capital Appropriations	(98,119)	(83,670)	(54,110)
35				Subtotal Cash from Borrowing & Approp	339,944	353,802	264,593
36				Annual Change in Cash Balance	(65,545)	(30,732)	(59,273)
37				Plus Beginning Cash Balance	510,900	445,355	414,623
38				Reserves For Risk	445,355	414,623	355,350
39				Reserves For Risk+Incremental Interest Credit	445,997	416,987	359,481

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11. REPAYMENT STUDY INPUT DATA

	A	B	C	D	E	F	G
1		A	G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
3	1	Bonneville Power Administration	09/1940	09/1985	2.500%	6,812	0
4	2	Bonneville Power Administration	09/1941	09/1986	2.500%	18,906	0
5	3	Bonneville Power Administration	09/1941	09/1986	2.500%	461	0
6	4	Bonneville Power Administration	09/1942	09/1987	2.500%	8,446	0
7	5	Bonneville Power Administration	09/1942	09/1987	2.500%	1,052	0
8	6	Bonneville Power Administration	09/1943	09/1988	2.500%	16,083	0
9	7	Bonneville Power Administration	09/1943	09/1988	2.500%	4,538	0
10	8	Bonneville Power Administration	09/1944	09/1989	2.500%	583	0
11	9	Bonneville Power Administration	09/1944	09/1989	2.500%	249	0
12	10	Bonneville Power Administration	09/1945	09/1990	2.500%	1,306	0
13	11	Bonneville Power Administration	09/1945	09/1990	2.500%	3,366	0
14	12	Bonneville Power Administration	09/1946	09/1991	2.500%	2,488	0
15	13	Bonneville Power Administration	09/1946	09/1991	2.500%	732	0
16	14	Bonneville Power Administration	09/1947	09/1992	2.500%	1,330	0
17	15	Bonneville Power Administration	09/1947	09/1992	2.500%	1,773	0
18	16	Bonneville Power Administration	09/1948	09/1993	2.500%	7,468	0
19	17	Bonneville Power Administration	09/1948	09/1993	2.500%	2,290	0
20	18	Bonneville Power Administration	09/1949	09/1994	2.500%	6,809	0
21	19	Bonneville Power Administration	09/1949	09/1994	2.500%	2,719	0
22	20	Bonneville Power Administration	09/1950	09/1995	2.500%	24,111	0
23	21	Bonneville Power Administration	09/1950	09/1995	2.500%	6,124	0
24	22	Bonneville Power Administration	09/1951	09/1996	2.500%	7,040	0
25	23	Bonneville Power Administration	09/1951	09/1996	2.500%	13,266	0
26	24	Bonneville Power Administration	09/1952	09/1997	2.500%	18,610	0
27	25	Bonneville Power Administration	09/1952	09/1997	2.500%	8,979	0
28	26	Bonneville Power Administration	09/1953	09/1998	6.330%	11,605	0
29	27	Bonneville Power Administration	09/1953	09/1998	6.330%	23,550	0
30	28	Bonneville Power Administration	09/1954	09/1999	6.510%	23,614	0
31	29	Bonneville Power Administration	09/1954	09/1999	6.510%	17,370	0
32	30	Bonneville Power Administration	09/1955	09/2000	6.620%	11,827	0
33	31	Bonneville Power Administration	09/1955	09/2000	6.620%	10,283	0
34	32	Bonneville Power Administration	09/1956	09/2001	6.710%	14,573	0
35	33	Bonneville Power Administration	09/1956	09/2001	6.710%	32,221	0
36	34	Bonneville Power Administration	09/1957	09/2002	6.790%	7,933	0
37	35	Bonneville Power Administration	09/1957	09/2002	6.790%	15,980	0
38	36	Bonneville Power Administration	09/1958	09/2003	6.840%	15,593	0
39	37	Bonneville Power Administration	09/1958	09/2003	6.840%	10,654	0
40	38	Bonneville Power Administration	09/1959	09/2004	6.880%	8,157	0
41	39	Bonneville Power Administration	09/1959	09/2004	6.880%	8,863	0
42	40	Bonneville Power Administration	09/1960	09/2005	6.910%	3,598	0

	A	B	C	D	E	F	G
1		A	G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
43	41	Bonneville Power Administration	09/1960	09/2005	6.910%	4,218	0
44	42	Bonneville Power Administration	09/1961	09/2006	6.950%	4,468	0
45	43	Bonneville Power Administration	09/1961	09/2006	6.950%	11,271	0
46	44	Bonneville Power Administration	09/1962	09/2007	6.980%	19,597	0
47	45	Bonneville Power Administration	09/1962	09/2007	6.980%	4,877	0
48	46	Bonneville Power Administration	09/1963	09/2008	7.020%	4,876	0
49	47	Bonneville Power Administration	09/1963	09/2008	7.020%	4,330	0
50	48	Bonneville Power Administration	09/1963	09/2008	7.020%	904	0
51	49	Bonneville Power Administration	09/1963	09/2008	7.020%	803	0
52	50	Bonneville Power Administration	09/1964	09/2009	7.060%	4,151	0
53	51	Bonneville Power Administration	09/1964	09/2009	7.060%	5,738	0
54	52	Bonneville Power Administration	09/1965	09/2010	7.090%	3,706	0
55	53	Bonneville Power Administration	09/1965	09/2010	7.090%	7,248	0
56	54	Bonneville Power Administration	09/1965	09/2010	7.090%	5,202	0
57	55	Bonneville Power Administration	09/1965	09/2010	7.090%	10,171	0
58	56	Bonneville Power Administration	09/1966	09/2011	7.130%	11,830	0
59	57	Bonneville Power Administration	09/1966	09/2011	7.130%	3,049	0
60	58	Bonneville Power Administration	09/1966	09/2011	7.130%	6,647	0
61	59	Bonneville Power Administration	09/1966	09/2011	7.130%	1,714	0
62	60	Bonneville Power Administration	09/1967	09/2012	7.160%	19,003	0
63	61	Bonneville Power Administration	09/1967	09/2012	7.160%	4,566	0
64	62	Bonneville Power Administration	09/1967	09/2012	7.160%	14,300	0
65	63	Bonneville Power Administration	09/1967	09/2012	7.160%	3,436	0
66	64	Bonneville Power Administration	09/1968	09/2013	7.200%	41,070	0
67	65	Bonneville Power Administration	09/1968	09/2013	7.200%	8,076	0
68	66	Bonneville Power Administration	09/1968	09/2013	7.200%	23,202	0
69	67	Bonneville Power Administration	09/1968	09/2013	7.200%	4,562	0
70	68	Bonneville Power Administration	09/1969	09/2014	7.230%	42,237	0
71	69	Bonneville Power Administration	09/1969	09/2014	7.230%	22,537	0
72	70	Bonneville Power Administration	09/1969	09/2014	7.230%	384	0
73	71	Bonneville Power Administration	09/1969	09/2014	7.230%	205	0
74	72	Bonneville Power Administration	09/1970	09/2015	7.270%	64,977	0
75	73	Bonneville Power Administration	09/1970	09/2015	7.270%	7,995	0
76	74	Bonneville Power Administration	09/1970	09/2015	7.270%	24,412	0
77	75	Bonneville Power Administration	09/1970	09/2015	7.270%	3,003	0
78	76	Bonneville Power Administration	09/1971	09/2016	7.290%	12,025	0
79	77	Bonneville Power Administration	09/1971	09/2016	7.290%	17,766	0
80	78	Bonneville Power Administration	09/1971	09/2016	7.290%	12,051	0
81	79	Bonneville Power Administration	09/1971	09/2016	7.290%	17,805	0
82	80	Bonneville Power Administration	09/1972	09/2017	7.290%	29,326	0

	A	B	C	D	E	F	G
1		A	G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
83	81	Bonneville Power Administration	09/1972	09/2017	7.290%	21,170	0
84	82	Bonneville Power Administration	09/1972	09/2017	7.290%	3,980	0
85	83	Bonneville Power Administration	09/1972	09/2017	7.290%	2,873	0
86	84	Bonneville Power Administration	09/1973	09/2018	7.280%	33,788	0
87	85	Bonneville Power Administration	09/1973	09/2018	7.280%	21,656	0
88	86	Bonneville Power Administration	09/1973	09/2018	7.280%	16,368	0
89	87	Bonneville Power Administration	09/1973	09/2018	7.280%	10,491	0
90	88	Bonneville Power Administration	09/1974	09/2019	7.270%	12,563	6,522
91	89	Bonneville Power Administration	09/1974	09/2019	7.270%	12,079	0
92	90	Bonneville Power Administration	09/1974	09/2019	7.270%	20,984	0
93	91	Bonneville Power Administration	09/1974	09/2019	7.270%	21,826	0
94	92	Bonneville Power Administration	09/1975	09/2020	7.250%	32,026	32,026
95	93	Bonneville Power Administration	09/1975	09/2020	7.250%	21,916	21,916
96	94	Bonneville Power Administration	09/1975	09/2020	7.250%	17,158	17,158
97	95	Bonneville Power Administration	09/1975	09/2020	7.250%	11,742	11,742
98	96	Bonneville Power Administration	09/1976	09/2021	7.230%	61,025	61,025
99	97	Bonneville Power Administration	09/1976	09/2021	7.230%	2,212	2,212
100	98	Bonneville Power Administration	09/1977	09/2022	7.210%	3,948	3,948
101	99	Bonneville Power Administration	09/1977	09/2022	7.210%	5,380	5,380
102	100	Bonneville Power Administration	09/1977	09/2022	7.210%	33,702	33,702
103	101	Bonneville Power Administration	09/1977	09/2022	7.210%	4,981	4,981
104	102	Construction	09/1978	09/2013	8.950%	17,770	0
105	103	Construction	09/1978	09/2013	8.950%	24,222	0
106	104	Construction	09/1978	09/2013	8.950%	3,389	0
107	105	Construction	09/1978	09/2013	8.950%	4,619	0
108	106	Construction	06/1979	06/2014	9.450%	7,010	0
109	107	Construction	06/1979	06/2014	9.450%	9,804	0
110	108	Construction	06/1979	06/2014	9.450%	26,690	0
111	109	Construction	06/1979	06/2014	9.450%	21,977	0
112	110	Construction	06/1979	06/2014	9.450%	6,026	0
113	111	Construction	06/1979	06/2014	9.450%	1,371	0
114	112	Construction	06/1979	06/2014	9.450%	1,870	0
115	113	Construction	06/1979	06/2014	9.450%	150	0
116	114	Construction	06/1979	06/2014	9.450%	102	0
117	115	Construction	09/1979	09/2014	9.900%	21,228	0
118	116	Construction	09/1979	09/2014	9.900%	14,340	0
119	117	Construction	09/1979	09/2014	9.900%	10,610	0
120	118	Construction	09/1979	09/2014	9.900%	2,888	0
121	119	Construction	09/1979	09/2014	9.900%	98	0
122	120	Construction	09/1979	09/2014	9.900%	66	0

	A	B	C	D	E	F	G
1		A	G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
123	121	Construction	09/1979	09/2014	9.900%	605	0
124	122	Construction	09/1979	09/2014	9.900%	165	0
125	123	Construction	09/1980	09/2015	13.000%	39,696	0
126	124	Construction	09/1980	09/2015	13.000%	10,806	0
127	125	Construction	09/1980	09/2015	13.000%	44,811	0
128	126	Construction	09/1980	09/2015	13.000%	1,469	0
129	127	Construction	09/1980	09/2015	13.000%	9,292	0
130	128	Construction	09/1980	09/2015	13.000%	4,253	0
131	129	Construction	09/1980	09/2015	13.000%	2,263	0
132	130	Construction	09/1980	09/2015	13.000%	616	0
133	131	Construction	09/1980	09/2015	13.000%	1,707	0
134	132	Construction	09/1980	09/2015	13.000%	56	0
135	133	Construction	09/1980	09/2015	13.000%	21	0
136	134	Construction	09/1980	09/2015	13.000%	10	0
137	135	Construction	09/1981	09/2016	16.600%	119,775	0
138	136	Construction	09/1981	09/2016	16.600%	54,821	0
139	137	Construction	09/1981	09/2016	16.600%	277	0
140	138	Construction	09/1981	09/2016	16.600%	127	0
141	139	Construction	12/1981	12/2016	14.400%	34,221	0
142	140	Construction	12/1981	12/2016	14.400%	15,663	0
143	141	Construction	12/1981	12/2016	14.400%	80	0
144	142	Construction	12/1981	12/2016	14.400%	36	0
145	143	Construction	04/1982	04/2017	14.400%	9,975	0
146	144	Construction	04/1982	04/2017	14.400%	4,566	0
147	145	Construction	04/1982	04/2017	14.400%	46,980	0
148	146	Construction	04/1982	04/2017	14.400%	37,455	0
149	147	Construction	04/1982	04/2017	14.400%	23	0
150	148	Construction	04/1982	04/2017	14.400%	11	0
151	149	Construction	04/1982	04/2017	14.400%	551	0
152	150	Construction	04/1982	04/2017	14.400%	439	0
153	151	Construction	07/1982	07/2017	14.150%	3,677	0
154	152	Construction	07/1982	07/2017	14.150%	2,932	0
155	153	Construction	07/1982	07/2017	14.150%	77,807	0
156	154	Construction	07/1982	07/2017	14.150%	43	0
157	155	Construction	07/1982	07/2017	14.150%	34	0
158	156	Construction	07/1982	07/2017	14.150%	402	0
159	157	Construction	07/1982	07/2017	14.150%	105	0
160	158	Construction	11/1982	11/2017	10.850%	205	0
161	159	Construction	11/1982	11/2017	10.850%	54	0
162	160	Construction	11/1982	11/2017	10.850%	39,741	0

	A	B	C	D	E	F	G
1		A	G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
163	161	Construction	06/1983	06/2018	11.700%	154	0
164	162	Construction	06/1983	06/2018	11.700%	29,806	0
165	163	Construction	06/1983	06/2018	11.700%	40	0
166	164	Construction	09/1983	09/2018	12.250%	814	0
167	165	Construction	09/1983	09/2018	12.250%	37,235	0
168	166	Construction	09/1983	09/2018	12.250%	6,708	0
169	167	Construction	09/1983	09/2018	12.250%	4	0
170	168	Construction	09/1983	09/2018	12.250%	1	0
171	169	Construction	09/1983	09/2018	12.250%	203	0
172	170	Construction	09/1983	09/2018	12.250%	35	0
173	171	Construction	11/1983	11/2018	12.300%	25,283	0
174	172	Construction	11/1983	11/2018	12.300%	4,555	0
175	173	Construction	11/1983	11/2018	12.300%	138	0
176	174	Construction	11/1983	11/2018	12.300%	24	0
177	175	Construction	09/1984	09/2019	13.050%	50,567	0
178	176	Construction	09/1984	09/2019	13.050%	9,109	0
179	177	Construction	09/1984	09/2019	13.050%	276	0
180	178	Construction	09/1984	09/2019	13.050%	48	0
181	179	Construction	06/1985	06/2029	11.250%	15,182	0
182	180	Construction	06/1985	06/2029	11.250%	460	0
183	181	Construction	06/1985	06/2029	11.250%	80	0
184	182	Construction	06/1985	06/2030	11.250%	84,278	0
185	183	Construction	03/1986	03/1996	8.150%	870	0
186	184	Construction	03/1986	03/1996	8.150%	157	0
187	185	Construction	03/1986	03/1996	8.150%	30,161	0
188	186	Construction	03/1986	03/1996	8.150%	68,194	0
189	187	Construction	03/1986	03/1996	8.150%	5	0
190	188	Construction	03/1986	03/1996	8.150%	1	0
191	189	Construction	03/1986	03/1996	8.150%	443	0
192	190	Construction	03/1986	03/1996	8.150%	169	0
193	191	Construction	06/1986	06/2031	8.950%	5,161	0
194	192	Construction	06/1986	06/2031	8.950%	11,668	0
195	193	Construction	06/1986	06/2031	8.950%	180,054	0
196	194	Construction	06/1986	06/2031	8.950%	3,117	0
197	195	Construction	06/1986	06/2031	8.950%	40,000	0
198	196	Construction	06/1986	06/2031	8.950%	57,354	0
199	197	Construction	06/1986	06/2031	8.950%	76	0
200	198	Construction	06/1986	06/2031	8.950%	29	0
201	199	Construction	06/1986	06/2031	8.950%	1,819	0
202	200	Construction	06/1986	06/2031	8.950%	722	0

	A	B	C	D	E	F	G
1	A		G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
203	201	Construction	04/1987	04/2032	9.300%	43,236	0
204	202	Construction	04/1987	04/2032	9.300%	54,409	0
205	203	Construction	04/1987	04/2032	9.300%	111	0
206	204	Construction	04/1987	04/2032	9.300%	281	0
207	205	Construction	04/1987	04/2032	9.300%	554	0
208	206	Construction	04/1987	04/2032	9.300%	1,409	0
209	207	Construction	06/1987	06/1992	8.350%	96,519	0
210	208	Construction	06/1987	06/1992	8.350%	2,498	0
211	209	Construction	06/1987	06/1992	8.350%	983	0
212	210	Construction	07/1987	07/2017	9.550%	4,113	0
213	211	Construction	07/1987	07/2017	9.550%	86,958	0
214	212	Construction	07/1987	07/2017	9.550%	569	0
215	213	Construction	07/1987	07/2017	9.550%	38	0
216	214	Construction	07/1987	07/2017	9.550%	3,274	0
217	215	Construction	07/1987	07/2017	9.550%	48	0
218	216	Construction	07/1987	07/2032	9.550%	618	0
219	217	Construction	07/1987	07/2032	9.550%	112	0
220	218	Construction	07/1987	07/2032	9.550%	7,903	0
221	219	Construction	07/1987	07/2032	9.550%	3,109	0
222	220	Construction	07/1987	07/2032	9.550%	37,342	0
223	221	Construction	07/1987	07/2032	9.550%	285	0
224	222	Construction	07/1987	07/2032	9.550%	631	0
225	223	Construction	02/1988	02/2018	9.500%	283	0
226	224	Construction	02/1988	02/2018	9.500%	43,417	0
227	225	Construction	02/1988	02/2033	9.500%	28,513	0
228	226	Construction	02/1988	02/2033	9.500%	27,887	0
229	227	Construction	02/1988	02/2033	9.500%	20,677	0
230	228	Construction	02/1988	02/2033	9.500%	22,923	0
231	229	Construction	02/1988	02/2033	9.500%	45,870	0
232	230	Construction	02/1988	02/2033	9.500%	954	0
233	231	Construction	02/1988	02/2033	9.500%	933	0
234	232	Construction	02/1988	02/2033	9.500%	518	0
235	233	Construction	02/1988	02/2033	9.500%	1,725	0
236	234	Construction	06/1988	06/2033	9.900%	9,018	0
237	235	Construction	06/1988	06/2033	9.900%	30,004	0
238	236	Construction	06/1988	06/2033	9.900%	226	0
239	237	Construction	06/1988	06/2033	9.900%	752	0
240	238	Construction	05/1989	05/1999	8.950%	16,909	0
241	239	Construction	05/1989	05/1999	8.950%	56,257	0
242	240	Construction	05/1989	05/1999	8.950%	424	0

	A	B	C	D	E	F	G
1	A		G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
243	241	Construction	05/1989	05/1999	8.950%	1,410	0
244	242	Construction	01/1990	01/2030	9.250%	41,894	0
245	243	Construction	01/1990	01/2030	9.250%	1,149	0
246	244	Construction	01/1990	01/2030	9.250%	3,824	0
247	245	Construction	01/1990	01/2030	9.250%	29	0
248	246	Construction	01/1990	01/2030	9.250%	96	0
249	247	Construction	01/1990	01/2030	9.250%	3,008	0
250	248	Construction	02/1991	02/1995	7.550%	54,145	0
251	249	Construction	02/1991	02/1995	7.550%	5,855	0
252	250	Construction	04/1992	04/1995	6.200%	80,000	0
253	251	Construction	04/1992	04/1997	7.000%	50,000	0
254	252	Construction	04/1992	04/1997	7.000%	28,300	0
255	253	Construction	04/1992	04/2032	8.800%	147,521	0
256	254	Construction	04/1992	04/2032	8.800%	2,479	0
257	255	Construction	07/1992	07/2032	8.130%	150,000	0
258	256	Construction	08/1992	08/2000	6.600%	107,800	0
259	257	Construction	08/1992	08/2007	7.250%	107,700	0
260	258	Construction	10/1992	10/1997	6.050%	50,000	0
261	259	Construction	02/1993	02/2033	7.800%	130,000	0
262	260	Construction	04/1993	04/2033	7.500%	100,000	0
263	261	Construction	08/1993	08/2033	6.950%	110,000	0
264	262	Construction	10/1993	10/2033	6.850%	50,000	0
265	263	Construction	10/1993	10/2033	6.850%	108,400	0
266	264	Construction	01/1994	01/2034	7.050%	50,000	0
267	265	Construction	05/1994	05/1998	7.100%	43,155	0
268	266	Construction	05/1994	05/1998	7.100%	49,489	0
269	267	Construction	05/1994	05/1998	7.100%	4,456	0
270	268	Construction	05/1994	05/2034	8.200%	50,000	0
271	269	Construction	09/1994	09/1999	7.650%	55,000	0
272	270	Construction	01/1995	01/2001	8.350%	55,000	0
273	271	Construction	08/1995	08/2025	7.700%	65,000	0
274	272	Construction	08/1996	08/2006	7.050%	70,000	0
275	273	Construction	05/1997	05/2005	6.900%	80,000	0
276	274	Construction	08/1997	08/2007	6.650%	111,254	0
277	275	Construction	04/1998	04/2008	6.000%	75,300	0
278	276	Construction	04/1998	04/2028	6.650%	50,000	0
279	277	Construction	05/1998	05/2009	6.000%	72,700	0
280	278	Construction	05/1998	05/2011	6.200%	40,000	0
281	279	Construction	05/1998	05/2032	6.700%	98,900	0
282	280	Construction	08/1998	08/2028	5.850%	106,500	106,500

	A	B	C	D	E	F	G
1		A	G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
283	281	Construction	08/1998	08/2028	5.850%	112,300	112,300
284	282	Construction	05/1999	05/2004	5.950%	26,200	0
285	283	Construction	09/1999	09/2002	6.200%	40,000	0
286	284	Construction	11/1999	11/2002	6.400%	40,000	0
287	285	Construction	01/2000	01/2005	7.150%	53,500	0
288	286	Construction	08/2000	08/2003	6.850%	15,300	0
289	287	Construction	09/2000	09/2006	6.750%	40,000	0
290	288	Construction	01/2001	01/2005	5.650%	20,000	0
291	289	Construction	06/2001	06/2011	5.950%	25,000	0
292	290	Construction	08/2001	08/2011	5.750%	50,000	0
293	291	Construction	06/2002	06/2005	3.750%	60,000	0
294	292	Construction	09/2002	09/2006	3.050%	100,000	0
295	293	Construction	11/2002	11/2005	2.800%	40,000	0
296	294	Construction	04/2003	04/2007	2.900%	40,000	0
297	295	Construction	04/2003	04/2033	5.550%	40,000	0
298	296	Construction	07/2003	07/2006	2.300%	75,000	0
299	297	Construction	07/2003	07/2007	2.950%	25,000	0
300	298	Construction	09/2003	09/2006	2.500%	20,000	0
301	299	Construction	01/2004	01/2008	2.950%	65,000	0
302	300	Construction	04/2004	04/2007	2.950%	65,000	0
303	301	Construction	07/2004	07/2007	3.450%	50,000	0
304	302	Construction	07/2004	07/2008	3.800%	25,000	0
305	303	Construction	09/2004	09/2007	3.100%	30,000	0
306	304	Construction	09/2004	09/2034	5.600%	40,000	0
307	305	Construction	01/2005	01/2035	5.400%	40,000	0
308	306	Construction	04/2005	04/2035	5.500%	40,000	0
309	307	Construction	06/2005	06/2009	4.000%	40,000	0
310	308	Construction	09/2005	09/2035	5.250%	45,000	0
311	309	Construction	03/2006	03/2009	5.050%	20,000	0
312	310	Construction	07/2006	07/2009	5.350%	70,000	0
313	311	Construction	09/2006	09/2010	4.950%	20,000	0
314	312	Construction	01/2007	01/2010	5.100%	25,000	0
315	313	Construction	03/2007	03/2012	4.850%	40,000	0
316	314	Construction	06/2007	06/2037	6.400%	35,000	0
317	315	Construction	07/2007	07/2010	5.200%	50,000	0
318	316	Construction	05/2008	05/2011	3.358%	40,000	0
319	317	Construction	07/2008	07/2012	3.913%	30,000	0
320	318	Construction	09/2008	09/2011	3.151%	25,000	0
321	319	Construction	01/2009	01/2020	3.830%	50,000	50,000
322	320	Construction	01/2009	01/2022	4.200%	20,000	20,000

	A	B	C	D	E	F	G
1		A	G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
323	321	Construction	04/2009	04/2022	4.253%	35,000	35,000
324	322	Construction	06/2009	06/2039	5.192%	35,000	35,000
325	323	Construction	07/2009	07/2041	4.026%	46,940	46,940
326	324	Construction	09/2009	09/2044	3.699%	35,000	35,000
327	325	Construction	10/2009	10/2019	3.842%	43,000	43,000
328	326	Construction	10/2009	10/2045	3.719%	23,000	23,000
329	327	Construction	11/2009	11/2045	3.533%	15,000	15,000
330	328	Construction	12/2009	12/2045	4.069%	13,000	13,000
331	329	Construction	01/2010	01/2045	3.714%	30,000	30,000
332	330	Construction	02/2010	02/2019	0.165%	10,000	0
333	331	Construction	03/2010	03/2021	4.188%	15,000	15,000
334	332	Construction	04/2010	04/2021	4.094%	22,000	22,000
335	333	Construction	05/2010	05/2021	3.694%	22,000	22,000
336	334	Construction	06/2010	06/2021	3.374%	22,000	22,000
337	335	Construction	07/2010	07/2020	3.118%	50,000	50,000
338	336	Construction	07/2010	07/2022	3.372%	30,000	30,000
339	337	Construction	08/2010	08/2022	0.165%	5,000	0
340	338	Construction	08/2010	08/2022	3.029%	20,000	20,000
341	339	Construction	09/2010	09/2023	3.161%	46,000	46,000
342	340	Construction	10/2010	10/2025	3.494%	45,000	45,000
343	341	Construction	01/2011	01/2036	4.952%	50,000	50,000
344	342	Construction	02/2011	02/2038	4.935%	55,000	55,000
345	343	Construction	04/2011	04/2039	4.794%	40,000	40,000
346	344	Construction	05/2011	09/2011	0.076%	40,000	0
347	345	Construction	05/2011	09/2011	0.076%	40,000	0
348	346	Construction	06/2011	06/2036	4.629%	50,000	50,000
349	347	Construction	06/2011	06/2040	4.775%	25,000	25,000
350	348	Construction	06/2011	09/2011	0.072%	25,000	0
351	349	Construction	08/2011	08/2029	4.238%	50,000	50,000
352	350	Construction	08/2011	08/2032	4.355%	98,900	98,900
353	351	Construction	08/2011	08/2033	4.386%	40,000	40,000
354	352	Construction	08/2011	08/2034	4.416%	40,000	40,000
355	353	Construction	08/2011	08/2035	4.446%	40,000	40,000
356	354	Construction	08/2011	08/2035	4.446%	40,000	40,000
357	355	Construction	08/2011	08/2035	4.446%	45,000	45,000
358	356	Construction	08/2011	08/2039	4.295%	50,000	0
359	357	Construction	09/2011	09/2040	3.796%	35,000	0
360	358	Construction	10/2011	10/2039	0.069%	45,000	0
361	359	Construction	01/2012	01/2040	1.757%	30,000	30,000
362	360	Construction	01/2012	09/2012	0.146%	30,000	0

	A	B	C	D	E	F	G
1	A		G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
363	361	Construction	03/2012	09/2012	0.210%	40,000	0
364	362	Construction	03/2012	03/2024	1.757%	45,000	45,000
365	363	Construction	05/2012	05/2027	1.757%	17,000	17,000
366	364	Construction	06/2012	09/2015	0.671%	26,000	26,000
367	365	Construction	06/2012	06/2037	3.503%	35,000	0
368	366	Construction	08/2012	08/2015	0.589%	37,000	37,000
369	367	Construction	09/2012	09/2017	0.891%	36,400	36,400
370	368	Construction	09/2012	09/2039	3.627%	39,000	0
371	369	Construction	11/2012	10/2042	5.687%	55,000	0
372	370	Construction	01/2013	01/2043	6.194%	30,000	0
373	371	Construction	02/2013	02/2043	5.993%	15,000	0
374	372	Construction	03/2013	03/2043	5.958%	18,000	0
375	373	Construction	04/2013	04/2043	5.633%	28,000	0
376	374	Construction	05/2013	05/2043	6.192%	20,000	0
377	375	Construction	06/2013	06/2043	6.938%	36,000	0
378	376	Construction	08/2013	02/2014	0.090%	39,000	0
379	377	Construction	08/2013	08/2034	7.413%	20,000	0
380	378	Construction	09/2013	02/2014	0.021%	5,000	0
381	379	Construction	09/2013	09/2034	4.214%	9,000	9,000
382	380	Construction	10/2013	10/2035	4.222%	64,000	64,000
383	381	Construction	11/2013	09/2014	0.140%	14,000	14,000
384	382	Construction	11/2013	10/2029	4.093%	55,000	55,000
385	383	Construction	11/2013	01/2031	4.162%	30,000	30,000
386	384	Construction	11/2013	02/2031	4.166%	15,000	15,000
387	385	Construction	11/2013	03/2031	4.171%	18,000	18,000
388	386	Construction	11/2013	04/2034	4.311%	28,000	28,000
389	387	Construction	11/2013	08/2034	4.324%	6,000	6,000
390	388	Construction	11/2013	05/2035	4.354%	20,000	20,000
391	389	Construction	11/2013	06/2036	4.397%	36,000	36,000
392	390	Construction	11/2013	11/2035	4.365%	15,000	15,000
393	391	Construction	12/2013	02/2014	0.052%	9,000	0
394	392	Construction	12/2013	12/2035	4.472%	10,000	10,000
395	393	Construction	01/2014	12/2018	1.943%	33,000	33,000
396	394	Construction	01/2014	12/2018	1.943%	30,000	30,000
397	395	Construction	01/2014	12/2018	1.943%	31,000	31,000
398	396	Construction	01/2014	12/2018	1.943%	48,000	48,000
399	397	Construction	01/2014	06/2014	0.083%	10,000	0
400	398	Construction	01/2014	01/2043	4.380%	15,000	15,000
401	399	Construction	02/2014	09/2014	0.077%	53,000	0
402	400	Construction	04/2014	02/2034	1.757%	45,000	45,000
403	401	Construction	04/2014	03/2034	1.757%	45,000	45,000

	A	B	C	D	E	F	G
1	A		G	E	D	B	C
2		PROJECT	IN SERVICE DATE	DUE DATE	INTEREST RATE	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL
404	402	Construction	04/2014	10/2039	1.757%	45,000	45,000
405	403	Construction	05/2014	05/2036	1.757%	29,000	29,000
406	404	Construction	06/2014	06/2015	0.303%	11,000	11,000
407	405	Construction	06/2014	06/2015	0.303%	63,000	63,000
408	406	Construction	06/2014	11/2032	1.757%	21,000	21,000
409	407	Construction (AS)	10/1992	10/2032	8.350%	99,962	0
410	408	Construction (AS)	07/1995	07/2025	7.700%	49,933	0
411	409	Construction (AS)	01/1996	01/2003	5.900%	54,378	0
412	410	Construction (AS)	01/1997	01/2004	6.800%	22,600	0
413	411	Construction (AS)	08/1998	08/2008	5.750%	36,819	0
414	412	Construction (AS)	02/1999	02/2014	5.900%	59,050	0
415	413	Construction (AS)	07/2000	07/2004	7.000%	39,052	0
416	414	Construction (AS)	01/2001	01/2010	6.050%	59,932	0
417	415	Construction (AS)	03/2002	03/2005	4.600%	108,010	0
418	416	Construction (AS)	10/2002	10/2005	3.000%	4,938	0
419	417	Construction (AS)	01/2004	01/2007	2.500%	46,643	0
420	418	Construction (AS)	11/2004	11/2008	3.750%	27,010	0
421	419	Construction (AS)	09/2006	09/2010	4.950%	5,319	0
422	420	Construction (AS)	01/2008	01/2012	3.200%	30,000	0
423	421	Construction (AS)	09/2008	09/2012	3.444%	25,000	0
424	422	Construction (AS)	09/2009	09/2014	2.746%	14,000	14,000
425	423	Construction (AS)	02/2010	02/2015	0.165%	7,500	0
426	424	Construction (AS)	08/2010	08/2015	1.619%	15,000	15,000
427	425	Construction (AS)	06/2011	06/2016	1.957%	13,000	13,000
428	426	Construction (AS)	08/2011	08/2016	1.423%	6,500	6,500
429	427	Construction (AS)	06/2012	09/2015	0.671%	14,300	14,300
430	428	Construction (AS)	11/2012	11/2018	1.109%	9,750	9,750
431	429	Construction (AS)	04/2013	04/2017	0.622%	4,550	4,550
432	430	Construction (AS)	06/2013	06/2019	1.962%	5,000	5,000
433	431	Construction (AS)	08/2013	08/2019	2.279%	3,000	3,000
434	432	Construction (AS)	10/2013	10/2019	2.039%	7,800	7,800
435	433	Construction (AS)	01/2014	01/2020	2.183%	3,250	3,250
436	434	Construction (AS)	02/2014	09/2014	0.117%	59,050	59,050
437	435	Construction (AS)	04/2014	03/2020	1.757%	2,600	2,600
438	436	Construction (AS)	05/2014	04/2020	1.757%	1,300	1,300
439	437	Environment	11/1996	11/2011	6.950%	40,000	0
440	438	Environment	01/2001	01/2010	6.050%	30,000	0
441	439	Environment	09/2002	09/2006	3.050%	30,000	0
442	440	Environment	03/2006	03/2009	5.050%	20,000	0
443	441	Environment	09/2008	09/2011	3.151%	10,000	0
444	442	Environment	02/2010	02/2025	4.279%	10,000	10,000
445	443	Environment	05/2012	05/2027	1.757%	13,000	13,000
446	444	Environment	11/2012	11/2027	5.046%	5,000	0
447	445	Environment	10/2013	10/2028	3.880%	6,000	6,000
448	446	Environment	11/2013	11/2027	3.967%	5,000	5,000
449	447	Environment	01/2014	01/2029	3.896%	3,000	3,000
450	448	Totals:				\$11,184,408	\$2,734,752

	A	B	C	D	E	F	G
1		A	B	C	D	F	E
2		PROJECT	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL	INTEREST RATE	IN SERVICE DATE	DUE DATE
3	1	Construction	540	540	1.757%	4/30/2032	7/31/2014
4	2	Construction	510	510	1.757%	8/31/2035	8/31/2014
5	3	Construction	5,000	5,000	3.635%	8/31/2035	8/31/2014
6	4	Construction	8,700	8,700	3.599%	9/30/2035	9/30/2014
7	5	Construction (AS)	10,500	10,500	1.757%	7/31/2020	7/31/2014
8	6	Construction (AS)	12,180	13,650	1.757%	8/31/2020	8/31/2014
9	7	Construction (AS)	55,000	55,000	1.757%	9/30/2020	9/30/2014
10	8	Environment	30,000	30,000	1.757%	7/31/2029	7/31/2014
11	9	2014 TOTAL:	122,430	123,900			
12	10	Construction	43,000	43,000	3.600%	10/31/2014	10/31/2025
13	11	Construction	25,000	25,000	3.660%	11/30/2014	11/30/2026
14	12	Construction	50,000	50,000	3.600%	12/31/2014	12/31/2025
15	13	Construction	34,000	34,000	3.540%	1/31/2015	1/31/2025
16	14	Construction	40,000	40,000	3.540%	2/28/2015	2/28/2025
17	15	Construction	56,000	56,000	3.540%	3/31/2015	3/31/2025
18	16	Construction	52,000	52,000	3.540%	4/30/2015	4/30/2025
19	17	Construction	59,000	59,000	3.660%	5/31/2015	5/31/2027
20	18	Construction	47,000	47,000	3.660%	6/30/2015	6/30/2027
21	19	Construction	47,000	47,000	3.780%	7/31/2015	7/31/2029
22	20	Construction	65,000	65,000	3.780%	8/31/2015	8/31/2029
23	21	Construction	69,000	69,000	3.780%	9/30/2015	9/30/2029
24	22	Construction (AS)	1,300	1,300	1.757%	10/31/2014	10/31/2020
25	23	Construction (AS)	1,300	1,300	2.530%	11/30/2014	11/30/2020
26	24	Construction (AS)	1,300	1,300	2.530%	12/31/2014	12/31/2020
27	25	Construction (AS)	650	650	2.530%	1/31/2015	1/31/2021
28	26	Construction (AS)	1,300	1,300	2.530%	2/28/2015	2/28/2021
29	27	Construction (AS)	1,300	1,300	2.530%	3/31/2015	3/31/2021
30	28	Construction (AS)	1,300	1,300	2.530%	4/30/2015	4/30/2021
31	29	Construction (AS)	1,300	1,300	2.530%	5/31/2015	5/31/2021
32	30	Construction (AS)	1,300	1,300	2.530%	6/30/2015	6/30/2021
33	31	Construction (AS)	1,300	1,300	2.530%	7/31/2015	7/31/2021
34	32	Construction (AS)	1,300	1,300	2.530%	8/31/2015	8/31/2021
35	33	Construction (AS)	2,600	2,600	2.530%	9/30/2015	9/30/2021
36	34	Environment	6,000	6,000	3.840%	9/30/2015	9/30/2030
37	35	2015 TOTAL:	609,250	609,250			
38	36	Construction	42,000	42,000	4.130%	10/31/2015	10/31/2026
39	37	Construction	25,000	25,000	4.130%	11/30/2015	11/30/2026
40	38	Construction	49,000	49,000	4.130%	12/31/2015	12/31/2026
41	39	Construction	33,000	33,000	4.270%	1/31/2016	1/31/2030
42	40	Construction	39,000	39,000	4.270%	2/28/2016	2/28/2030
43	41	Construction	55,000	55,000	4.270%	3/31/2016	3/31/2030
44	42	Construction	51,000	51,000	4.270%	4/30/2016	4/30/2030
45	43	Construction	58,000	58,000	4.320%	5/30/2016	5/31/2031
46	44	Construction	45,000	45,000	4.320%	6/30/2016	6/30/2031
47	45	Construction	46,000	46,000	4.320%	7/31/2016	7/31/2031
48	46	Construction	63,000	63,000	4.320%	8/31/2016	8/31/2031

	A	B	C	D	E	F	G
1		A	B	C	D	F	E
2		PROJECT	ORIGINAL PRINCIPAL	CURRENT PRINCIPAL	INTEREST RATE	IN SERVICE DATE	DUE DATE
49	47	Construction	67,000	67,000	4.320%	9/30/2016	9/30/2031
50	48	Construction (AS)	1,300	1,300	3.470%	10/31/2015	10/31/2021
51	49	Construction (AS)	1,300	1,300	3.470%	11/30/2015	11/30/2021
52	50	Construction (AS)	1,300	1,300	3.470%	12/31/2015	12/31/2021
53	51	Construction (AS)	1,300	1,300	3.470%	1/31/2016	1/31/2022
54	52	Construction (AS)	1,300	1,300	3.470%	2/28/2016	2/28/2022
55	53	Construction (AS)	1,300	1,300	3.470%	3/31/2016	3/31/2022
56	54	Construction (AS)	1,300	1,300	3.470%	4/30/2016	4/30/2022
57	55	Construction (AS)	1,300	1,300	3.470%	5/31/2016	5/31/2022
58	56	Construction (AS)	1,950	1,950	3.470%	6/30/2016	6/30/2022
59	57	Construction (AS)	1,300	1,300	3.470%	7/31/2016	7/31/2022
60	58	Construction (AS)	1,300	1,300	3.470%	8/31/2016	8/31/2022
61	59	Construction (AS)	3,250	3,250	3.470%	9/30/2016	9/30/2022
62	60	Environment	7,000	7,000	4.320%	9/30/2016	9/30/2031
63	61	2016 TOTAL:	598,200	598,200			
64	62	Construction	38,000	38,000	4.870%	10/31/2016	10/31/2031
65	63	Construction (AS)	650	650	4.550%	10/31/2016	10/31/2022
66	64	Construction	23,000	23,000	4.870%	11/30/2016	11/30/2031
67	65	Construction (AS)	1,300	1,300	4.550%	11/30/2016	11/30/2022
68	66	Construction	45,000	45,000	4.870%	12/31/2016	12/31/2031
69	67	Construction (AS)	650	650	4.550%	12/31/2016	12/31/2022
70	68	Construction	30,000	30,000	4.870%	1/31/2017	1/31/2032
71	69	Construction (AS)	650	650	4.550%	1/31/2017	1/31/2023
72	70	Construction	36,000	36,000	4.870%	2/28/2017	2/29/2032
73	71	Construction (AS)	1,300	1,300	4.550%	2/28/2017	2/28/2023
74	72	Construction	50,000	50,000	4.870%	3/31/2017	3/31/2032
75	73	Construction (AS)	1,300	1,300	4.550%	3/31/2017	3/31/2023
76	74	Construction	46,000	46,000	4.900%	4/30/2017	4/30/2033
77	75	Construction (AS)	650	650	4.550%	4/30/2017	4/30/2023
78	76	Construction	53,000	53,000	4.900%	5/31/2017	5/31/2033
79	77	Construction (AS)	1,300	1,300	4.550%	5/31/2017	5/31/2023
80	78	Construction	42,000	42,000	4.750%	6/30/2017	6/30/2027
81	79	Construction (AS)	1,300	1,300	4.550%	6/30/2017	6/30/2023
82	80	Construction	42,000	42,000	4.750%	7/31/2017	7/31/2027
83	81	Construction (AS)	1,300	1,300	4.550%	7/31/2017	7/31/2023
84	82	Construction	58,000	58,000	5.000%	8/31/2017	8/31/2037
85	83	Construction (AS)	1,300	1,300	4.550%	8/31/2017	8/31/2023
86	84	Construction	61,000	61,000	5.000%	9/30/2017	9/30/2037
87	85	Construction (AS)	2,600	2,600	4.550%	9/30/2017	9/30/2023
88	86	Environment	7,000	7,000	4.870%	9/30/2017	9/30/2032
89	87	2017 TOTAL:	545,300	545,300			

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12. REPAYMENT STUDY RESULTS

	A	B	C	D	E	F	G	H	I	J	K	L
1	Obligation Type	General Project	Specific Project		2014	2015	2016	2017	2018	2019	2020	2021
2	Appropriation	Bonneville Power Administration	Bonneville Power Administration		14,514	14,514	14,418	8,351	4,821	-	-	-
3			Bonneville Power Administration Subtotal:		14,514	14,514	14,418	8,351	4,821	-	-	-
4		Appropriation Subtotal:			14,514	14,514	14,418	8,351	4,821	-	-	-
5	Treasury	BPA Borrowing	(Less Interest Income)		(2,027)	(1,282)	(1,434)	(1,350)	(1,430)	(2,888)	(2,753)	(2,647)
6			Construction		74,019	92,520	113,361	134,095	132,207	127,925	120,373	110,007
7			Interest Accrual		15,680	19,812	25,241	24,544	24,114	22,688	20,109	18,514
8			Interest Accrual Reversal		(10,165)	(15,680)	(19,812)	(25,241)	(24,544)	(24,114)	(22,688)	(20,109)
9			Construction (AS)		1,546	1,503	1,612	1,798	1,747	1,693	1,335	947
10			Interest Accrual		264	329	390	356	356	290	194	118
11			Interest Accrual Reversal		(170)	(264)	(329)	(390)	(356)	(356)	(290)	(194)
12			Environment		935	1,256	1,486	1,789	1,789	1,789	1,789	1,789
13			Interest Accrual		304	304	304	304	304	304	304	304
14			Interest Accrual Reversal		(113)	(304)	(304)	(304)	(304)	(304)	(304)	(304)
15			Replacements		-	-	-	4,648	14,152	24,048	34,311	44,884
16			BPA Borrowing Subtotal:		80,272	98,194	120,516	140,248	148,035	151,074	152,379	153,309
17		Treasury Subtotal:			80,272	98,194	120,516	140,248	148,035	151,074	152,379	153,309
18	Grand Total:				\$94,786	\$112,708	\$134,934	\$148,599	\$152,856	\$151,074	\$152,379	\$153,309

	A	B	M	N	O	P	Q	R	S	T	U	V	W
1	Obligation Type	General Project	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
2	Appropriation	Bonneville Power Administration	-	-	-	-	-	-	-	-	-	-	-
3			-	-	-	-	-	-	-	-	-	-	-
4		Appropriation Subtotal:	-	-	-	-	-	-	-	-	-	-	-
5	Treasury	BPA Borrowing	(2,660)	(2,657)	(2,690)	(2,831)	(2,835)	(2,824)	(2,817)	(2,825)	(2,825)	(2,804)	(2,784)
6			100,219	90,236	78,244	68,766	58,782	48,310	40,506	24,610	11,234	2,902	-
7			16,650	14,541	13,523	12,116	8,519	5,463	4,199	2,998	776	-	-
8			(18,514)	(16,650)	(14,541)	(13,523)	(12,116)	(8,519)	(5,463)	(4,199)	(2,998)	(776)	-
9			496	-	-	-	-	-	-	-	-	-	-
10			-	-	-	-	-	-	-	-	-	-	-
11			(118)	-	-	-	-	-	-	-	-	-	-
12			1,789	1,789	1,424	1,060	1,060	1,060	732	458	230	-	-
13			304	304	268	268	268	191	125	-	-	-	-
14			(304)	(304)	(304)	(268)	(268)	(268)	(191)	(125)	-	-	-
15			55,762	66,977	78,504	90,317	102,383	114,687	127,214	139,944	152,877	164,754	170,028
16			153,623	154,236	154,426	155,905	155,793	158,099	164,304	160,861	159,295	164,076	167,245
17		Treasury Subtotal:	153,623	154,236	154,426	155,905	155,793	158,099	164,304	160,861	159,295	164,076	167,245
18	Grand Total:		\$153,623	\$154,236	\$154,426	\$155,905	\$155,793	\$158,099	\$164,304	\$160,861	\$159,295	\$164,076	\$167,245

	A	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
1	Obligation Type	General Project	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
2	Appropriation	Bonneville Power Administration	-	-	-	-	-	-	-	-	-	-	-	-
3			-	-	-	-	-	-	-	-	-	-	-	-
4		Appropriation Subtotal:	-	-	-	-	-	-	-	-	-	-	-	-
5	Treasury	BPA Borrowing	(2,075)	(2,567)	(2,811)	(2,810)	(1,616)	(1,378)	(1,660)	(1,850)	(1,541)	(1,861)	(1,460)	(2,481)
6			-	-	-	-	-	-	-	-	-	-	-	-
7			-	-	-	-	-	-	-	-	-	-	-	-
8			-	-	-	-	-	-	-	-	-	-	-	-
9			-	-	-	-	-	-	-	-	-	-	-	-
10			-	-	-	-	-	-	-	-	-	-	-	-
11			-	-	-	-	-	-	-	-	-	-	-	-
12			-	-	-	-	-	-	-	-	-	-	-	-
13			-	-	-	-	-	-	-	-	-	-	-	-
14			-	-	-	-	-	-	-	-	-	-	-	-
15			172,331	175,660	176,891	177,610	182,518	192,485	202,794	212,047	222,124	232,611	243,867	253,614
16			170,256	173,093	174,080	174,799	180,902	191,107	201,134	210,198	220,583	230,750	242,406	251,133
17		Treasury Subtotal:	170,256	173,093	174,080	174,799	180,902	191,107	201,134	210,198	220,583	230,750	242,406	251,133
18	Grand Total:		\$170,256	\$173,093	\$174,080	\$174,799	\$180,902	\$191,107	\$201,134	\$210,198	\$220,583	\$230,750	\$242,406	\$251,133

	A	B	AJ	AK	AL	AM	AN	AO	AP	AQ
1	Obligation Type	General Project	2045	2046	2047	2048	2049	2050	2051	Total
2	Appropriation	Bonneville Power Administration	-	-	-	-	-	-	-	56,617
3			-	-	-	-	-	-	-	56,617
4		Appropriation Subtotal:	-	-	-	-	-	-	-	56,617
5	Treasury	BPA Borrowing	(3,068)	(3,057)	(3,044)	(3,029)	(3,013)	(2,995)	(2,975)	(91,655)
6			-	-	-	-	-	-	-	1,428,315
7			-	-	-	-	-	-	-	249,486
8			-	-	-	-	-	-	-	(259,651)
9			-	-	-	-	-	-	-	12,678
10			-	-	-	-	-	-	-	2,297
11			-	-	-	-	-	-	-	(2,467)
12			-	-	-	-	-	-	-	22,220
13			-	-	-	-	-	-	-	4,156
14			-	-	-	-	-	-	-	(4,268)
15			258,553	261,955	265,723	269,875	274,474	279,533	285,025	5,725,180
16			255,485	258,899	262,680	266,846	271,461	276,537	282,050	7,086,290
17		Treasury Subtotal:	255,485	258,899	262,680	266,846	271,461	276,537	282,050	7,086,290
18	Grand Total:		\$255,485	\$258,899	\$262,680	\$266,846	\$271,461	\$276,537	\$282,050	\$7,142,907

	A	B	C	D	E	F	G	H	I	J	K
	A	B	C	D	E	F	G	H	I	J	
		Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total	
1											
2											
3											
4	1	2014	Bonneville Power	Historical	200,612	7.235%	14,514	-	-	14,514	
5	2	2014	Construction	Historical	1,611,040	4.020%	64,757	-	-	64,757	
6	3	2014	Construction	New	796,890	1.162%	9,263	-	5,514	14,777	
7	4	2014	Construction (AS)	Historical	85,100	1.612%	1,372	-	-	1,372	
8	5	2014	Construction (AS)	New	77,971	0.224%	174	-	94	268	
9	6	2014	Environment	Historical	23,000	2.848%	655	-	-	655	
10	7	2014	Environment	New	17,000	1.644%	280	-	191	471	
11	8	2014	Float	Historical	-	-	(2,027)	-	-	(2,027)	
12	9		FY 2014 Subtotal:		2,811,614		88,987	-	5,799	94,786	
13	10	2015	Bonneville Power	Historical	200,612	7.235%	14,514	-	-	14,514	
14	11	2015	Construction	Historical	2,458,930	3.582%	88,088	-	(4)	88,084	
15	12	2015	Construction	New	518,000	0.856%	4,433	-	4,135	8,568	
16	13	2015	Construction (AS)	Historical	94,147	1.515%	1,426	-	(19)	1,408	
17	14	2015	Construction (AS)	New	13,650	0.566%	77	-	83	161	
18	15	2015	Environment	Historical	40,000	3.140%	1,256	-	-	1,256	
19	16	2015	Float	Historical	-	-	(1,282)	-	-	(1,282)	
20	17		FY 2015 Subtotal:		3,325,339		108,511	-	4,197	112,708	
21	18	2016	Bonneville Power	Historical	199,293	7.235%	14,418	-	-	14,418	
22	19	2016	Construction	Historical	2,908,930	3.746%	108,958	-	-	108,958	
23	20	2016	Construction	New	506,000	0.870%	4,402	-	5,430	9,832	
24	21	2016	Construction (AS)	Historical	81,097	1.849%	1,499	-	(80)	1,420	
25	22	2016	Construction (AS)	New	14,950	0.754%	113	-	141	253	
26	23	2016	Environment	Historical	46,000	3.231%	1,486	-	-	1,486	
27	24	2016	Float	Historical	-	-	(1,434)	-	-	(1,434)	
28	25		FY 2016 Subtotal:		3,756,270		129,443	-	5,491	134,934	
29	26	2017	Bonneville Power	Historical	115,624	7.222%	8,351	-	-	8,351	
30	27	2017	Construction	Historical	3,481,930	3.851%	134,095	-	(698)	133,398	
31	28	2017	Construction (AS)	Historical	79,797	2.253%	1,798	-	(34)	1,764	
32	29	2017	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
33	30	2017	Replacements	New	183,360	2.535%	4,648	-	-	4,648	
34	31	2017	Float	Historical	-	-	(1,350)	-	-	(1,350)	
35	32		FY 2017 Subtotal:		3,913,710		149,331	-	(732)	148,599	
36	33	2018	Bonneville Power	Historical	66,812	7.216%	4,821	-	-	4,821	
37	34	2018	Construction	Historical	3,445,530	3.837%	132,207	-	(430)	131,777	
38	35	2018	Construction (AS)	Historical	75,247	2.322%	1,747	-	-	1,747	
39	36	2018	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
40	37	2018	Replacements	Historical	183,360	5.070%	9,296	-	-	9,296	
41	38	2018	Replacements	New	191,559	2.535%	4,856	-	-	4,856	
42	39	2018	Float	Historical	-	-	(1,430)	-	-	(1,430)	
43	40		FY 2018 Subtotal:		4,015,508		153,286	-	(430)	152,856	
44	41	2019	Construction	Historical	3,408,924	3.753%	127,925	-	(1,426)	126,499	
45	42	2019	Construction (AS)	Historical	75,247	2.250%	1,693	-	(67)	1,627	
46	43	2019	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
47	44	2019	Replacements	Historical	374,919	5.070%	19,008	-	-	19,008	
48	45	2019	Replacements	New	198,805	2.535%	5,040	-	-	5,040	
49	46	2019	Float	Historical	-	-	(2,888)	-	-	(2,888)	
50	47		FY 2019 Subtotal:		4,110,896		152,567	-	(1,492)	151,074	
51	48	2020	Construction	Historical	3,132,568	3.843%	120,373	-	(2,579)	117,794	
52	49	2020	Construction (AS)	Historical	57,497	2.322%	1,335	-	(96)	1,239	
53	50	2020	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
54	51	2020	Replacements	Historical	573,725	5.070%	29,088	-	-	29,088	
55	52	2020	Replacements	New	206,036	2.535%	5,223	-	-	5,223	
56	53	2020	Float	Historical	-	-	(2,753)	-	-	(2,753)	
57	54		FY 2020 Subtotal:		4,022,826		155,055	-	(2,675)	152,379	

	A	B	C	D	E	F	G	H	I	J	K
	A	B	C	D	E	F	G	H	I	J	
		Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total	
58	55	2021	Construction	Historical	2,874,223	3.827%	110,007	-	(1,595)	108,412	
59	56	2021	Construction (AS)	Historical	34,450	2.748%	947	-	(75)	871	
60	57	2021	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
61	58	2021	Replacements	Historical	779,761	5.070%	39,534	-	-	39,534	
62	59	2021	Replacements	New	211,032	2.535%	5,350	-	-	5,350	
63	60	2021	Float	Historical	-	-	(2,647)	-	-	(2,647)	
64	61	FY 2021 Subtotal:			3,952,465		154,979	-	(1,670)	153,309	
65	62	2022	Construction	Historical	2,624,018	3.819%	100,219	-	(1,864)	98,354	
66	63	2022	Construction (AS)	Historical	18,200	2.725%	496	-	(118)	378	
67	64	2022	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
68	65	2022	Replacements	Historical	990,793	5.070%	50,233	-	-	50,233	
69	66	2022	Replacements	New	218,095	2.535%	5,529	-	-	5,529	
70	67	2022	Float	Historical	-	-	(2,660)	-	-	(2,660)	
71	68	FY 2022 Subtotal:			3,904,106		155,605	-	(1,983)	153,623	
72	69	2023	Construction	Historical	2,380,122	3.791%	90,236	-	(2,108)	88,128	
73	70	2023	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
74	71	2023	Replacements	Historical	1,208,888	5.070%	61,291	-	-	61,291	
75	72	2023	Replacements	New	224,307	2.535%	5,686	-	-	5,686	
76	73	2023	Float	Historical	-	-	(2,657)	-	-	(2,657)	
77	74	FY 2023 Subtotal:			3,866,317		156,344	-	(2,108)	154,236	
78	75	2024	Construction	Historical	2,120,090	3.691%	78,244	-	(1,019)	77,226	
79	76	2024	Environment	Historical	53,000	2.686%	1,424	-	(36)	1,387	
80	77	2024	Replacements	Historical	1,433,195	5.070%	72,663	-	-	72,663	
81	78	2024	Replacements	New	230,400	2.535%	5,841	-	-	5,841	
82	79	2024	Float	Historical	-	-	(2,690)	-	-	(2,690)	
83	80	FY 2024 Subtotal:			3,836,684		155,481	-	(1,055)	154,426	
84	81	2025	Construction	Historical	1,873,181	3.671%	68,766	-	(1,406)	67,359	
85	82	2025	Environment	Historical	36,000	2.943%	1,060	-	-	1,060	
86	83	2025	Replacements	Historical	1,663,594	5.070%	84,344	-	-	84,344	
87	84	2025	Replacements	New	235,625	2.535%	5,973	-	-	5,973	
88	85	2025	Float	Historical	-	-	(2,831)	-	-	(2,831)	
89	86	FY 2025 Subtotal:			3,808,401		157,311	-	(1,406)	155,905	
90	87	2026	Construction	Historical	1,590,435	3.696%	58,782	-	(3,597)	55,185	
91	88	2026	Environment	Historical	36,000	2.943%	1,060	-	-	1,060	
92	89	2026	Replacements	Historical	1,899,220	5.070%	96,290	-	-	96,290	
93	90	2026	Replacements	New	240,341	2.535%	6,093	-	-	6,093	
94	91	2026	Float	Historical	-	-	(2,835)	-	-	(2,835)	
95	92	FY 2026 Subtotal:			3,765,996		159,390	-	(3,597)	155,793	
96	93	2027	Construction	Historical	1,311,312	3.684%	48,310	-	(3,056)	45,254	
97	94	2027	Environment	Historical	36,000	2.943%	1,060	-	(77)	983	
98	95	2027	Replacements	Historical	2,139,561	5.070%	108,476	-	-	108,476	
99	96	2027	Replacements	New	245,011	2.535%	6,211	-	-	6,211	
100	97	2027	Float	Historical	-	-	(2,824)	-	-	(2,824)	
101	98	FY 2027 Subtotal:			3,731,884		161,232	-	(3,133)	158,099	
102	99	2028	Construction	Historical	1,046,216	3.872%	40,506	-	(1,264)	39,241	
103	100	2028	Environment	Historical	23,000	3.182%	732	-	(66)	666	
104	101	2028	Replacements	Historical	2,384,572	5.070%	120,898	-	-	120,898	
105	102	2028	Replacements	New	249,147	2.535%	6,316	-	-	6,316	
106	103	2028	Float	Historical	-	-	(2,817)	-	-	(2,817)	
107	104	FY 2028 Subtotal:			3,702,935		165,635	-	(1,331)	164,304	
108	105	2029	Construction	Historical	780,063	3.155%	24,610	-	(1,201)	23,409	
109	106	2029	Environment	Historical	18,000	2.544%	458	-	(125)	333	
110	107	2029	Replacements	Historical	2,633,719	5.070%	133,530	-	-	133,530	
111	108	2029	Replacements	New	253,031	2.535%	6,414	-	-	6,414	
112	109	2029	Float	Historical	-	-	(2,825)	-	-	(2,825)	
113	110	FY 2029 Subtotal:			3,684,812		162,187	-	(1,326)	160,861	

	A	B	C	D	E	F	G	H	I	J	K
	A	B	C	D	E	F	G	H	I	J	
1											
2											
3		Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total	
114	111	2030	Construction	Historical	516,787	2.174%	11,234	-	(2,222)	9,013	
115	112	2030	Environment	Historical	6,000	3.840%	230	-	-	230	
116	113	2030	Replacements	Historical	2,886,750	5.070%	146,358	-	-	146,358	
117	114	2030	Replacements	New	257,142	2.535%	6,519	-	-	6,519	
118	115	2030	Float	Historical	-	-	(2,825)	-	-	(2,825)	
119	116		FY 2030 Subtotal:		3,666,679		161,516	-	(2,222)	159,295	
120	117	2031	Construction	Historical	221,906	1.308%	2,902	-	(776)	2,126	
121	118	2031	Replacements	Historical	3,143,892	5.030%	158,133	-	-	158,133	
122	119	2031	Replacements	New	261,208	2.535%	6,622	-	-	6,622	
123	120	2031	Float	Historical	-	-	(2,804)	-	-	(2,804)	
124	121		FY 2031 Subtotal:		3,627,005		164,851	-	(776)	164,076	
125	122	2032	Replacements	Historical	3,355,292	4.867%	163,302	-	-	163,302	
126	123	2032	Replacements	New	265,356	2.535%	6,727	-	-	6,727	
127	124	2032	Float	Historical	-	-	(2,784)	-	-	(2,784)	
128	125		FY 2032 Subtotal:		3,620,648		167,245	-	-	167,245	
129	126	2033	Replacements	Historical	3,351,942	4.937%	165,488	-	-	165,488	
130	127	2033	Replacements	New	269,936	2.535%	6,843	-	-	6,843	
131	128	2033	Float	Historical	-	-	(2,075)	-	-	(2,075)	
132	129		FY 2033 Subtotal:		3,621,878		170,256	-	-	170,256	
133	130	2034	Replacements	Historical	3,446,121	4.896%	168,706	-	-	168,706	
134	131	2034	Replacements	New	274,348	2.535%	6,955	-	-	6,955	
135	132	2034	Float	Historical	-	-	(2,567)	-	-	(2,567)	
136	133		FY 2034 Subtotal:		3,720,469		173,093	-	-	173,093	
137	134	2035	Replacements	Historical	3,483,281	4.875%	169,813	-	-	169,813	
138	135	2035	Replacements	New	279,210	2.535%	7,078	-	-	7,078	
139	136	2035	Float	Historical	-	-	(2,811)	-	-	(2,811)	
140	137		FY 2035 Subtotal:		3,762,491		174,080	-	-	174,080	
141	138	2036	Replacements	Historical	3,494,677	4.876%	170,404	-	-	170,404	
142	139	2036	Replacements	New	284,238	2.535%	7,205	-	-	7,205	
143	140	2036	Float	Historical	-	-	(2,810)	-	-	(2,810)	
144	141		FY 2036 Subtotal:		3,778,916		174,799	-	-	174,799	
145	142	2037	Replacements	Historical	3,511,621	4.990%	175,217	-	-	175,217	
146	143	2037	Replacements	New	288,012	2.535%	7,301	-	-	7,301	
147	144	2037	Float	Historical	-	-	(1,616)	-	-	(1,616)	
148	145		FY 2037 Subtotal:		3,799,634		180,902	-	-	180,902	
149	146	2038	Replacements	Historical	3,688,292	5.018%	185,077	-	-	185,077	
150	147	2038	Replacements	New	292,229	2.535%	7,408	-	-	7,408	
151	148	2038	Float	Historical	-	-	(1,378)	-	-	(1,378)	
152	149		FY 2038 Subtotal:		3,980,521		191,107	-	-	191,107	
153	150	2039	Replacements	Historical	3,904,793	5.001%	195,270	-	-	195,270	
154	151	2039	Replacements	New	296,795	2.535%	7,524	-	-	7,524	
155	152	2039	Float	Historical	-	-	(1,660)	-	-	(1,660)	
156	153		FY 2039 Subtotal:		4,201,588		201,134	-	-	201,134	
157	154	2040	Replacements	Historical	4,094,972	4.992%	204,414	-	-	204,414	
158	155	2040	Replacements	New	301,108	2.535%	7,633	-	-	7,633	
159	156	2040	Float	Historical	-	-	(1,850)	-	-	(1,850)	
160	157		FY 2040 Subtotal:		4,396,080		210,198	-	-	210,198	
161	158	2041	Replacements	Historical	4,269,813	5.022%	214,413	-	-	214,413	
162	159	2041	Replacements	New	304,160	2.535%	7,710	-	-	7,710	
163	160	2041	Float	Historical	-	-	(1,541)	-	-	(1,541)	
164	161		FY 2041 Subtotal:		4,573,973		220,583	-	-	220,583	
165	162	2042	Replacements	Historical	4,492,466	5.004%	224,795	-	-	224,795	
166	163	2042	Replacements	New	308,309	2.535%	7,816	-	-	7,816	
167	164	2042	Float	Historical	-	-	(1,861)	-	-	(1,861)	
168	165		FY 2042 Subtotal:		4,800,775		230,750	-	-	230,750	

	A	B	C	D	E	F	G	H	I	J	K
	A	B	C	D	E	F	G	H	I	J	
		Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total	
169	166	2043	Replacements	Historical	4,683,506	5.038%	235,932	-	-	235,932	
170	167	2043	Replacements	New	313,004	2.535%	7,935	-	-	7,935	
171	168	2043	Float	Historical	-	-	(1,460)	-	-	(1,460)	
172	169	FY 2043 Subtotal:			4,996,510		242,406	-	-	242,406	
173	170	2044	Replacements	Historical	4,936,490	4.974%	245,564	-	-	245,564	
174	171	2044	Replacements	New	317,533	2.535%	8,049	-	-	8,049	
175	172	2044	Float	Historical	-	-	(2,481)	-	-	(2,481)	
176	173	FY 2044 Subtotal:			5,254,023		251,133	-	-	251,133	
177	174	2045	Replacements	Historical	5,067,988	4.940%	250,383	-	-	250,383	
178	175	2045	Replacements	New	322,291	2.535%	8,170	-	-	8,170	
179	176	2045	Float	Historical	-	-	(3,068)	-	-	(3,068)	
180	177	FY 2045 Subtotal:			5,390,279		255,485	-	-	255,485	
181	178	2046	Replacements	Historical	5,131,353	4.944%	253,678	-	-	253,678	
182	179	2046	Replacements	New	326,523	2.535%	8,277	-	-	8,277	
183	180	2046	Float	Historical	-	-	(3,057)	-	-	(3,057)	
184	181	FY 2046 Subtotal:			5,457,876		258,899	-	-	258,899	
185	182	2047	Replacements	Historical	5,202,196	4.947%	257,362	-	-	257,362	
186	183	2047	Replacements	New	329,815	2.535%	8,361	-	-	8,361	
187	184	2047	Float	Historical	-	-	(3,044)	-	-	(3,044)	
188	185	FY 2047 Subtotal:			5,532,011		262,680	-	-	262,680	
189	186	2048	Replacements	Historical	5,279,981	4.951%	261,407	-	-	261,407	
190	187	2048	Replacements	New	334,044	2.535%	8,468	-	-	8,468	
191	188	2048	Float	Historical	-	-	(3,029)	-	-	(3,029)	
192	189	FY 2048 Subtotal:			5,614,025		266,846	-	-	266,846	
193	190	2049	Replacements	Historical	5,365,994	4.955%	265,880	-	-	265,880	
194	191	2049	Replacements	New	339,003	2.535%	8,594	-	-	8,594	
195	192	2049	Float	Historical	-	-	(3,013)	-	-	(3,013)	
196	193	FY 2049 Subtotal:			5,704,998		271,461	-	-	271,461	
197	194	2050	Replacements	Historical	5,461,384	4.959%	270,841	-	-	270,841	
198	195	2050	Replacements	New	342,853	2.535%	8,691	-	-	8,691	
199	196	2050	Float	Historical	-	-	(2,995)	-	-	(2,995)	
200	197	FY 2050 Subtotal:			5,804,237		276,537	-	-	276,537	
201	198	2051	Replacements	Historical	5,565,547	4.964%	276,259	-	-	276,259	
202	199	2051	Replacements	New	345,791	2.535%	8,766	-	-	8,766	
203	200	2051	Float	Historical	-	-	(2,975)	-	-	(2,975)	
204	201	FY 2051 Subtotal:			5,911,338		282,050	-	-	282,050	
205	202	Grand Total:			\$161,425,714		\$7,153,355	-	(\$10,448)	\$7,142,907	

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
	Bonneville Power Administration	Bonneville Power Administration	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	Bonneville Power Administration	Bonneville Power Administration																			
2		Bonneville Power Administration Subtotal:	14,514	14,514	14,418	8,351	4,821	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Appropriation Subtotal:		14,514	14,514	14,418	8,351	4,821	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	BPA Borrowing	(Less Interest Income)	14,514	14,514	14,418	8,351	4,821	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5		Construction	(2,027)	(1,282)	(1,434)	(1,350)	(1,430)	(2,888)	(2,753)	(2,647)	(2,660)	(2,657)	(2,690)	(2,831)	(2,835)	(2,824)	(2,817)	(2,825)	(2,825)	(2,804)	(2,784)
6		Interest Accrual	74,019	92,520	113,361	134,095	132,207	127,925	120,373	110,007	100,219	90,236	78,244	68,766	58,782	48,310	40,506	24,610	11,234	2,902	-
7		Interest Accrual Reversal	15,680	19,812	25,241	24,544	24,114	22,688	20,109	18,514	16,650	14,541	13,523	12,116	8,519	5,463	4,199	2,998	776	-	-
8		Construction (AS)	(10,165)	(15,680)	(19,812)	(25,241)	(24,544)	(24,114)	(22,688)	(20,109)	(18,514)	(16,650)	(14,541)	(13,523)	(12,116)	(8,519)	(5,463)	(4,199)	(2,998)	(776)	-
9		Interest Accrual	1,546	1,503	1,612	1,798	1,747	1,693	1,335	947	496	-	-	-	-	-	-	-	-	-	-
10		Interest Accrual Reversal	264	329	390	356	356	290	194	118	-	-	-	-	-	-	-	-	-	-	-
11		Environment	(170)	(264)	(329)	(390)	(356)	(356)	(290)	(194)	(118)	-	-	-	-	-	-	-	-	-	-
12		Interest Accrual	935	1,256	1,486	1,789	1,789	1,789	1,789	1,789	1,789	1,789	1,424	1,060	1,060	1,060	732	458	230	-	-
13		Interest Accrual Reversal	304	304	304	304	304	304	304	304	304	304	268	268	268	191	125	-	-	-	-
14		Replacements	(113)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(268)	(268)	(268)	(191)	(125)	-	-	-
15		BPA Borrowing Subtotal:	-	-	-	4,648	14,152	24,048	34,311	44,884	55,762	66,977	78,504	90,317	102,383	114,687	127,214	139,944	152,877	164,754	170,028
16	Treasury Subtotal:		80,272	98,194	120,516	140,248	148,035	151,074	152,379	153,309	153,623	154,236	154,426	155,905	155,793	158,099	164,304	160,861	159,295	164,076	167,245
17			80,272	98,194	120,516	140,248	148,035	151,074	152,379	153,309	153,623	154,236	154,426	155,905	155,793	158,099	164,304	160,861	159,295	164,076	167,245
18			\$94,786	\$112,708	\$134,934	\$148,599	\$152,856	\$151,074	\$152,379	\$153,309	\$153,623	\$154,236	\$154,426	\$155,905	\$155,793	\$158,099	\$164,304	\$160,861	\$159,295	\$164,076	\$167,245

	B	C	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
1	Bonneville Power Administration	Bonneville Power Administration	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	Total
2		Bonneville Power Administration Subtotal:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56,617
3	Appropriation Subtotal:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56,617
4	BPA Borrowing	(Less Interest Income)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56,617
5		Construction	(2,075)	(2,567)	(2,811)	(2,810)	(1,616)	(1,378)	(1,660)	(1,850)	(1,541)	(1,861)	(1,460)	(2,481)	(3,068)	(3,057)	(3,044)	(3,029)	(3,013)	(2,995)	(2,975)	(91,655)
6		Interest Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,428,315
7		Interest Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249,486
8		Construction (AS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(259,651)
9		Interest Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12,678
10		Interest Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,297
11		Environment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(2,467)
12		Interest Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22,220
13		Interest Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,156
14		Replacements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(4,268)
15		BPA Borrowing Subtotal:	172,331	175,660	176,891	177,610	182,518	192,485	202,794	212,047	222,124	232,611	243,867	253,614	258,553	261,955	265,723	269,875	274,474	279,533	285,025	5,725,180
16	Treasury Subtotal:		170,256	173,093	174,080	174,799	180,902	191,107	201,134	210,198	220,583	230,750	242,406	251,133	255,485	258,899	262,680	266,846	271,461	276,537	282,050	7,086,290
17			170,256	173,093	174,080	174,799	180,902	191,107	201,134	210,198	220,583	230,750	242,406	251,133	255,485	258,899	262,680	266,846	271,461	276,537	282,050	7,086,290
18			\$170,256	\$173,093	\$174,080	\$174,799	\$180,902	\$191,107	\$201,134	\$210,198	\$220,583	\$230,750	\$242,406	\$251,133	\$255,485	\$258,899	\$262,680	\$266,846	\$271,461	\$276,537	\$282,050	\$7,142,907

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
1																			
2																			
3	1	2014	Construction (AS)	-	2/28/2014	9/30/2014	59,050	59,050	0.117%	0.117%									59,050
4	2	2014	Construction	-	11/20/2013	9/30/2014	14,000	14,000	0.140%	0.140%									14,000
5	3	2014	Construction (AS)	-	9/30/2009	9/30/2014	14,000	14,000	2.746%	2.746%									14,000
6	4		FY 2014 Subtotal:	-	-	-	87,050	87,050	-	-									87,050
7	5	2015	Construction	-	6/30/2014	6/30/2015	11,000	11,000	0.303%	0.303%									11,000
8	6	2015	Construction	-	6/30/2014	6/30/2015	63,000	63,000	0.303%	0.303%									63,000
9	7	2015	Construction (AS)	-	8/31/2010	8/31/2015	15,000	15,000	1.619%	1.619%									15,000
10	8	2015	Construction	-	8/20/2012	8/31/2015	37,000	37,000	0.589%	0.589%									37,000
11	9	2015	Construction	-	6/20/2012	9/30/2015	26,000	26,000	0.671%	0.671%									26,000
12	10	2015	Construction (AS)	-	6/20/2012	9/30/2015	14,300	14,300	0.671%	0.671%									14,300
13	11	2015	Bonneville Power Administration	Bonneville Power Administration	9/30/1974	9/30/2019	12,563	6,522	7.270%	7.270%									1,319
14	12		FY 2015 Subtotal:	-	-	-	178,863	172,822	-	-									167,619
15	13	2016	Construction (AS)	-	6/22/2011	6/30/2016	13,000	13,000	1.957%	1.957%									13,000
16	14	2016	Construction (AS)	-	8/12/2011	8/31/2016	6,500	6,500	1.423%	1.423%									6,500
17	15	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1974	9/30/2019	12,563	5,203	7.270%	7.270%									5,203
18	16	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	32,026	32,026	7.250%	7.250%									27,650
19	17	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	21,916	21,916	7.250%	7.250%									21,916
20	18	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	17,158	17,158	7.250%	7.250%									17,158
21	19	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	11,742	11,742	7.250%	7.250%									11,742
22	20		FY 2016 Subtotal:	-	-	-	114,905	107,545	-	-									103,170
23	21	2017	Construction (AS)	-	4/30/2013	4/30/2017	4,550	4,550	0.622%	0.622%									4,550
24	22	2017	Construction	-	9/30/2012	9/30/2017	36,400	36,400	0.891%	0.891%									36,400
25	23	2017	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	32,026	4,376	7.250%	7.250%									4,376
26	24	2017	Bonneville Power Administration	Bonneville Power Administration	9/30/1976	9/30/2021	61,025	61,025	7.230%	7.230%									42,224
27	25	2017	Bonneville Power Administration	Bonneville Power Administration	9/30/1976	9/30/2021	2,212	2,212	7.230%	7.230%									2,212
28	26		FY 2017 Subtotal:	-	-	-	136,213	108,563	-	-									89,762
29	27	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1976	9/30/2021	61,025	18,801	7.230%	7.230%									18,801
30	28	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	3,948	3,948	7.210%	7.210%									3,948
31	29	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	5,380	5,380	7.210%	7.210%									5,380
32	30	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	33,702	33,702	7.210%	7.210%									33,702
33	31	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	4,981	4,981	7.210%	7.210%									4,981
34	32	2018	Construction	-	6/30/2009	6/30/2039	35,000	35,000	5.192%	5.192%									33,097
35	33		FY 2018 Subtotal:	-	-	-	144,036	101,812	-	-									99,908
36	34	2019	Construction (AS)	-	11/30/2012	11/30/2018	9,750	9,750	1.109%	1.109%									9,750
37	35	2019	Construction	-	1/16/2014	12/31/2018	33,000	33,000	1.943%	1.943%									33,000
38	36	2019	Construction	-	1/16/2014	12/31/2018	30,000	30,000	1.943%	1.943%									30,000
39	37	2019	Construction	-	1/16/2014	12/31/2018	31,000	31,000	1.943%	1.943%									31,000
40	38	2019	Construction	-	1/16/2014	12/31/2018	48,000	48,000	1.943%	1.943%									48,000
41	39	2019	Construction (AS)	-	6/30/2013	6/30/2019	5,000	5,000	1.962%	1.962%									5,000
42	40	2019	Construction (AS)	-	8/31/2013	8/31/2019	3,000	3,000	2.279%	2.279%									3,000
43	41	2019	Construction	-	1/31/2011	1/31/2036	50,000	50,000	4.952%	4.952%									49,044
44	42	2019	Construction	-	2/28/2011	2/28/2038	55,000	55,000	4.935%	4.935%									53,543
45	43	2019	Construction	-	4/30/2011	4/30/2039	40,000	40,000	4.794%	4.794%									24,207
46	44	2019	Construction	-	6/30/2009	6/30/2039	35,000	1,903	5.192%	5.192%									1,903
47	45		FY 2019 Subtotal:	-	-	-	339,750	306,653	-	-									288,447
48	46	2020	Construction (AS)	-	10/31/2013	10/31/2019	7,800	7,800	2.039%	2.039%									7,800
49	47	2020	Construction	-	10/31/2009	10/31/2019	43,000	43,000	3.842%	3.842%									43,000
50	48	2020	Construction (AS)	-	1/31/2014	1/31/2020	3,250	3,250	2.183%	2.183%									3,250
51	49	2020	Construction	-	1/31/2009	1/31/2020	50,000	50,000	3.830%	3.830%									50,000
52	50	2020	Construction (AS)	-	4/30/2014	3/31/2020	2,600	2,600	1.757%	1.757%									2,600
53	51	2020	Construction (AS)	-	5/31/2014	4/30/2020	1,300	1,300	1.757%	1.757%									1,300
54	52	2020	Construction (AS)	-	7/31/2014	7/31/2020	1,950	1,950	1.757%	1.757%									1,950
55	53	2020	Construction	-	7/31/2010	7/31/2020	50,000	50,000	3.118%	3.118%									50,000
56	54	2020	Construction (AS)	-	8/31/2014	8/31/2020	2,021	2,021	1.757%	1.757%									2,021
57	55	2020	Construction (AS)	-	9/30/2014	9/30/2020	4,125	4,125	1.757%	1.757%									4,125
58	56	2020	Construction	-	8/2/2011	8/31/2035	45,000	45,000	4.446%	4.446%									9,776
59	57	2020	Construction	-	12/31/2013	12/31/2035	10,000	10,000	4.472%	4.472%									9,346
60	58	2020	Construction	-	6/22/2011	6/30/2036	50,000	50,000	4.629%	4.629%									47,445
61	59	2020	Construction	-	4/30/2011	4/30/2039	40,000	14,697	4.794%	4.794%									14,096
62	60	2020	Construction	-	6/22/2011	6/30/2040	25,000	25,000	4.775%	4.775%									23,847
63	61		FY 2020 Subtotal:	-	-	-	336,047	310,744	-	-									270,558

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
64	62	2021	Construction (AS)	-	10/31/2014	1,300	1,300	1.757%	1.757%					1,300					
65	63	2021	Construction (AS)	-	11/30/2014	1,300	1,300	2.530%	2.530%					1,300					
66	64	2021	Construction (AS)	-	12/31/2014	1,300	1,300	2.530%	2.530%					1,300					
67	65	2021	Construction (AS)	-	1/31/2015	650	650	2.530%	2.530%					650					
68	66	2021	Construction (AS)	-	2/28/2015	1,300	1,300	2.530%	2.530%					1,300					
69	67	2021	Construction (AS)	-	3/31/2015	1,300	1,300	2.530%	2.530%					1,300					
70	68	2021	Construction	-	3/31/2010	15,000	15,000	4.188%	4.188%					15,000					
71	69	2021	Construction (AS)	-	4/30/2015	1,300	1,300	2.530%	2.530%					1,300					
72	70	2021	Construction	-	4/30/2010	22,000	22,000	4.094%	4.094%					22,000					
73	71	2021	Construction	-	5/31/2010	22,000	22,000	3.694%	3.694%					22,000					
74	72	2021	Construction (AS)	-	5/31/2015	1,300	1,300	2.530%	2.530%					1,300					
75	73	2021	Construction (AS)	-	6/30/2015	1,300	1,300	2.530%	2.530%					1,300					
76	74	2021	Construction	-	6/30/2010	22,000	22,000	3.374%	3.374%					22,000					
77	75	2021	Construction (AS)	-	7/31/2015	1,300	1,300	2.530%	2.530%					1,300					
78	76	2021	Construction (AS)	-	8/31/2015	1,300	1,300	2.530%	2.530%					1,300					
79	77	2021	Construction (AS)	-	9/30/2015	2,600	2,600	2.530%	2.530%					2,600					
80	78	2021	Construction	-	8/2/2011	40,000	40,000	4.416%	4.416%					37,533		2,467			
81	79	2021	Construction	-	8/2/2011	40,000	40,000	4.446%	4.446%					37,485		2,515			
82	80	2021	Construction	-	8/2/2011	40,000	40,000	4.446%	4.446%					37,485		2,515			
83	81	2021	Construction	-	8/2/2011	45,000	34,527	4.446%	4.446%					32,356		2,171			
84	82	2021	Construction	-	11/20/2013	36,000	36,000	4.397%	4.397%					15,506		1,167			
85	83		FY 2021 Subtotal:	-	-	298,250	287,777	-	-					257,615		10,834			
86	84	2022	Construction (AS)	-	10/31/2015	1,300	1,300	3.470%	3.470%					1,300					
87	85	2022	Construction (AS)	-	11/30/2015	1,300	1,300	3.470%	3.470%					1,300					
88	86	2022	Construction (AS)	-	12/31/2015	1,300	1,300	3.470%	3.470%					1,300					
89	87	2022	Construction (AS)	-	1/31/2016	1,300	1,300	3.470%	3.470%					1,300					
90	88	2022	Construction	-	1/31/2009	20,000	20,000	4.200%	4.200%					20,000					
91	89	2022	Construction (AS)	-	2/28/2016	1,300	1,300	3.470%	3.470%					1,300					
92	90	2022	Construction (AS)	-	3/31/2016	1,300	1,300	3.470%	3.470%					1,300					
93	91	2022	Construction (AS)	-	4/30/2016	1,300	1,300	3.470%	3.470%					1,300					
94	92	2022	Construction	-	4/30/2009	35,000	35,000	4.253%	4.253%					35,000					
95	93	2022	Construction (AS)	-	5/31/2016	1,300	1,300	3.470%	3.470%					1,300					
96	94	2022	Construction (AS)	-	6/30/2016	1,950	1,950	3.470%	3.470%					1,950					
97	95	2022	Construction (AS)	-	7/31/2016	1,300	1,300	3.470%	3.470%					1,300					
98	96	2022	Construction	-	7/31/2010	30,000	30,000	3.372%	3.372%					30,000					
99	97	2022	Construction (AS)	-	8/31/2016	1,300	1,300	3.470%	3.470%					1,300					
100	98	2022	Construction	-	8/31/2010	20,000	20,000	3.029%	3.029%					20,000					
101	99	2022	Construction (AS)	-	9/30/2016	3,250	3,250	3.470%	3.470%					3,250					
102	100	2022	Construction	-	8/2/2011	98,900	98,900	4.355%	4.355%					51,752		2,954			
103	101	2022	Construction	-	8/2/2011	40,000	40,000	4.386%	4.386%					37,760		2,240			
104	102	2022	Construction	-	11/30/2013	15,000	15,000	4.365%	4.365%					14,011		989			
105	103	2022	Construction	-	11/20/2013	36,000	19,327	4.397%	4.397%					18,048		1,279			
106	104	2022	Construction	-	1/31/2014	15,000	15,000	4.380%	4.380%					13,623		1,377			
107	105		FY 2022 Subtotal:	-	-	328,100	311,427	-	-					258,394		8,839			
108	106	2023	Construction	-	9/30/2010	46,000	46,000	3.161%	3.161%					46,000					
109	107	2023	Construction	-	5/30/2016	58,000	58,000	4.320%	4.320%					58,000					
110	108	2023	Construction	-	6/30/2016	45,000	45,000	4.320%	4.320%					45,000					
111	109	2023	Construction	-	7/31/2016	46,000	46,000	4.320%	4.320%					43,018					
112	110	2023	Construction	-	8/2/2011	98,900	44,194	4.355%	4.355%					42,059		2,135			
113	111	2023	Construction	-	11/20/2013	6,000	6,000	4.324%	4.324%					5,635		365			
114	112	2023	Construction	-	11/20/2013	20,000	20,000	4.354%	4.354%					18,798		1,202			
115	113		FY 2023 Subtotal:	-	-	319,900	265,194	-	-					258,511		3,702			
116	114	2024	Construction	-	3/31/2012	45,000	45,000	1.757%	1.757%					45,000					
117	115	2024	Environment	-	2/28/2010	10,000	10,000	4.279%	4.279%					10,000	7				
118	116	2024	Construction	-	1/31/2016	33,000	33,000	4.270%	4.270%					33,000					
119	117	2024	Construction	-	2/28/2016	39,000	39,000	4.270%	4.270%					9,449					
120	118	2024	Construction	-	7/31/2016	46,000	2,982	4.320%	4.320%					2,982					
121	119	2024	Construction	-	8/31/2016	63,000	63,000	4.320%	4.320%					63,000					
122	120	2024	Environment	-	9/30/2016	7,000	7,000	4.320%	4.320%					7,000					
123	121	2024	Construction	-	9/30/2016	67,000	67,000	4.320%	4.320%					67,000					
124	122	2024	Construction	-	11/20/2013	28,000	28,000	4.311%	4.311%					26,478		1,522			
125	123		FY 2024 Subtotal:	-	-	338,000	294,982	-	-					263,909	7	1,522			

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
126	124	2025	Construction	-	1/31/2015	1/31/2025	34,000	34,000	3.540%	3.540%									34,000
127	125	2025	Construction	-	2/28/2015	2/28/2025	40,000	40,000	3.540%	3.540%									40,000
128	126	2025	Construction	-	3/31/2015	3/31/2025	56,000	56,000	3.540%	3.540%									56,000
129	127	2025	Construction	-	4/30/2015	4/30/2025	52,000	52,000	3.540%	3.540%									52,000
130	128	2025	Construction	-	2/28/2016	2/28/2030	39,000	29,551	4.270%	4.270%									29,551
131	129	2025	Construction	-	3/31/2016	3/31/2030	55,000	55,000	4.270%	4.270%									55,000
132	130	2025	Construction	-	4/30/2016	4/30/2030	51,000	51,000	4.270%	4.270%									12,277
133	131	FY 2025 Subtotal:		-	-	-	327,000	317,551	-	-	-	-	-						278,828
134	132	2026	Construction	-	10/31/2010	10/31/2025	45,000	45,000	3.494%	3.494%									45,000
135	133	2026	Construction	-	10/31/2014	10/31/2025	43,000	43,000	3.600%	3.600%									43,000
136	134	2026	Construction	-	12/31/2014	12/31/2025	50,000	50,000	3.600%	3.600%									50,000
137	135	2026	Construction	-	8/2/2011	8/31/2029	50,000	50,000	4.238%	4.238%							633		49,367
138	136	2026	Construction	-	4/30/2016	4/30/2030	51,000	38,723	4.270%	4.270%									38,723
139	137	2026	Construction	-	10/31/2013	10/31/2035	64,000	64,000	4.222%	4.222%									53,033
140	138	FY 2026 Subtotal:		-	-	-	303,000	290,723	-	-	-	-	-						279,123
141	139	2027	Construction	-	10/31/2015	10/31/2026	42,000	42,000	4.130%	4.130%									42,000
142	140	2027	Construction	-	11/30/2014	11/30/2026	25,000	25,000	3.660%	3.660%									25,000
143	141	2027	Construction	-	11/30/2015	11/30/2026	25,000	25,000	4.130%	4.130%									25,000
144	142	2027	Construction	-	12/31/2015	12/31/2026	49,000	49,000	4.130%	4.130%									49,000
145	143	2027	Construction	-	5/3/2012	5/31/2027	17,000	17,000	1.757%	1.757%									17,000
146	144	2027	Environment	-	5/3/2012	5/31/2027	13,000	13,000	1.757%	1.757%									13,000
147	145	2027	Construction	-	5/31/2015	5/31/2027	59,000	59,000	3.660%	3.660%									59,000
148	146	2027	Construction	-	6/30/2015	6/30/2027	47,000	47,000	3.660%	3.660%									47,000
149	147	FY 2027 Subtotal:		-	-	-	277,000	277,000	-	-	-	-	-						277,000
150	148	2028	Environment	-	11/20/2013	11/30/2027	5,000	5,000	3.967%	3.967%									5,000
151	149	2028	Construction	-	8/31/1998	8/31/2028	106,500	106,500	5.850%	5.850%									106,500
152	150	2028	Construction	-	8/31/1998	8/31/2028	112,300	112,300	5.850%	5.850%									112,300
153	151	2028	Construction	-	11/20/2013	2/28/2031	15,000	15,000	4.166%	4.166%									13,397
154	152	2028	Construction	-	11/20/2013	3/31/2031	18,000	18,000	4.171%	4.171%									17,774
155	153	2028	Construction	-	9/30/2013	9/30/2034	9,000	9,000	4.214%	4.214%									8,656
156	154	2028	Construction	-	10/31/2013	10/31/2035	64,000	7,682	4.222%	4.222%									7,332
157	155	FY 2028 Subtotal:		-	-	-	329,800	273,482	-	-	-	-	-						270,959
158	156	2029	Construction	-	12/31/2009	12/31/2018	13,000	13,000	4.069%	5.223%	Auto	12/31/2018	12/31/2045	5.223%					13,000
159	157	2029	Construction	-	7/31/2009	7/31/2019	46,940	46,940	4.026%	5.179%	Global	7/31/2019	7/31/2041	5.179%					37,369
160	158	2029	Environment	-	10/31/2013	10/31/2028	6,000	6,000	3.880%	3.880%									6,000
161	159	2029	Environment	-	1/31/2014	1/31/2029	3,000	3,000	3.896%	3.896%									3,000
162	160	2029	Environment	-	7/31/2014	7/31/2029	3,000	3,000	1.757%	1.757%									3,000
163	161	2029	Construction	-	7/31/2015	7/31/2029	47,000	47,000	3.780%	3.780%									47,000
164	162	2029	Construction	-	8/31/2015	8/31/2029	65,000	65,000	3.780%	3.780%									65,000
165	163	2029	Construction	-	9/30/2015	9/30/2029	69,000	69,000	3.780%	3.780%									69,000
166	164	2029	Construction	-	11/20/2013	1/31/2031	30,000	30,000	4.162%	4.162%									29,815
167	165	2029	Construction	-	11/20/2013	2/28/2031	15,000	1,427	4.166%	4.166%									1,418
168	166	FY 2029 Subtotal:		-	-	-	297,940	284,367	-	-	-	-	-						274,602
169	167	2030	Construction	-	10/31/2009	10/31/2018	23,000	23,000	3.719%	5.223%	Auto	10/31/2018	10/31/2045	5.223%					23,000
170	168	2030	Construction	-	11/30/2009	11/30/2018	15,000	15,000	3.533%	5.223%	Auto	11/30/2018	11/30/2045	5.223%					15,000
171	169	2030	Construction	-	1/31/2010	1/31/2019	30,000	30,000	3.714%	5.223%	Auto	1/31/2019	1/31/2045	5.223%					30,000
172	170	2030	Construction	-	7/31/2009	7/31/2019	46,940	9,571	4.026%	5.179%	Global	7/31/2019	7/31/2041	5.179%					9,571
173	171	2030	Construction	-	9/30/2009	9/30/2019	35,000	35,000	3.699%	5.212%	Auto	9/30/2019	9/30/2044	5.212%					35,000
174	172	2030	Construction	-	11/20/2013	10/31/2029	55,000	55,000	4.093%	4.093%									55,000
175	173	2030	Environment	-	9/30/2015	9/30/2030	6,000	6,000	3.840%	3.840%									6,000
176	174	2030	Construction	-	7/31/2014	4/30/2032	9,000	9,000	1.757%	1.757%									9,000
177	175	2030	Construction	-	6/30/2014	11/30/2032	21,000	21,000	1.757%	1.757%									10,025
178	176	2030	Construction	-	8/31/2014	8/31/2035	18,740	18,740	3.635%	3.635%									674
179	177	2030	Construction	-	9/30/2014	9/30/2035	65,000	65,000	3.599%	3.599%									65,000
180	178	FY 2030 Subtotal:		-	-	-	324,680	287,311	-	-	-	-	-						276,335

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
181	179	2031	Construction	-	6/30/2014	11/30/2032	21,000	10,302	1.757%	1.757%				9,912				389	
182	180	2031	Construction	-	4/30/2014	2/28/2034	45,000	45,000	1.757%	1.757%				41,669				3,331	
183	181	2031	Construction	-	4/30/2014	3/31/2034	45,000	45,000	1.757%	1.757%				41,674				3,326	
184	182	2031	Construction	-	8/31/2014	8/31/2035	42,150	42,150	1.757%	1.757%				42,150					
185	183	2031	Construction	-	5/31/2014	5/31/2036	29,000	29,000	1.757%	1.757%				25,468				3,532	
186	184	2031	Construction	-	4/30/2014	10/31/2039	45,000	45,000	1.757%	1.757%				36,747				8,253	
187	185	2031	Construction	-	1/27/2012	1/31/2040	30,000	30,000	1.757%	1.757%				24,285				5,715	
188	186	2031	Replacements	-	3/31/2017	3/31/2052	183,360	183,360	5.070%	5.070%				49,807					
189	187		FY 2031 Subtotal:	-	-	-	440,510	429,812	-	-				271,713				24,546	
190	188	2032	Replacements	-	3/31/2017	3/31/2052	183,360	133,553	5.070%	5.070%				133,553					
191	189	2032	Replacements	-	3/31/2018	3/31/2053	191,559	191,559	5.070%	5.070%				135,153					
192	190		FY 2032 Subtotal:	-	-	-	374,919	325,112	-	-				268,706					
193	191	2033	Replacements	-	3/31/2018	3/31/2053	191,559	56,407	5.070%	5.070%				56,407					
194	192	2033	Replacements	-	3/31/2019	3/31/2054	198,805	198,805	5.070%	5.070%				119,351					
195	193		FY 2033 Subtotal:	-	-	-	390,365	255,212	-	-				175,758					
196	194	2034	Replacements	-	3/31/2019	3/31/2054	198,805	79,454	5.070%	5.070%				79,454					
197	195	2034	Replacements	-	3/31/2020	3/31/2055	206,036	206,036	5.070%	5.070%				157,733					
198	196		FY 2034 Subtotal:	-	-	-	404,841	285,490	-	-				237,187					
199	197	2035	Replacements	-	3/31/2020	3/31/2055	206,036	48,303	5.070%	5.070%				48,303					
200	198	2035	Replacements	-	3/31/2021	3/31/2056	211,032	211,032	5.070%	5.070%				211,032					
201	199	2035	Replacements	-	3/31/2022	3/31/2057	218,095	218,095	5.070%	5.070%				8,479					
202	200		FY 2035 Subtotal:	-	-	-	635,163	477,430	-	-				267,814					
203	201	2036	Replacements	-	3/31/2022	3/31/2057	218,095	209,617	5.070%	5.070%				209,617					
204	202	2036	Replacements	-	3/31/2023	3/31/2058	224,307	224,307	5.070%	5.070%				57,678					
205	203		FY 2036 Subtotal:	-	-	-	442,402	433,923	-	-				267,294					
206	204	2037	Replacements	-	3/31/2023	3/31/2058	224,307	166,629	5.070%	5.070%				111,342					
207	205		FY 2037 Subtotal:	-	-	-	224,307	166,629	-	-				111,342					
208	206	2038	Replacements	-	3/31/2023	3/31/2058	224,307	55,287	5.070%	5.070%				55,287					
209	207	2038	Replacements	-	3/31/2024	3/31/2059	230,400	230,400	5.070%	5.070%				20,442					
210	208		FY 2038 Subtotal:	-	-	-	454,706	285,687	-	-				75,728					
211	209	2039	Replacements	-	3/31/2024	3/31/2059	230,400	209,958	5.070%	5.070%				106,616					
212	210		FY 2039 Subtotal:	-	-	-	230,400	209,958	-	-				106,616					
213	211	2040	Replacements	-	3/31/2024	3/31/2059	230,400	103,342	5.070%	5.070%				103,342					
214	212	2040	Replacements	-	3/31/2025	3/31/2060	235,625	235,625	5.070%	5.070%				22,924					
215	213		FY 2040 Subtotal:	-	-	-	466,025	338,968	-	-				126,266					
216	214	2041	Replacements	-	3/31/2025	3/31/2060	235,625	212,701	5.070%	5.070%				81,508					
217	215		FY 2041 Subtotal:	-	-	-	235,625	212,701	-	-				81,508					
218	216	2042	Replacements	-	3/31/2025	3/31/2060	235,625	131,194	5.070%	5.070%				117,269					
219	217		FY 2042 Subtotal:	-	-	-	235,625	131,194	-	-				117,269					
220	218	2043	Replacements	-	3/31/2025	3/31/2060	235,625	13,925	5.070%	5.070%				13,925					
221	219	2043	Replacements	-	3/31/2026	3/31/2061	240,341	240,341	5.070%	5.070%				46,095					
222	220		FY 2043 Subtotal:	-	-	-	475,967	254,266	-	-				60,020					
223	221	2044	Replacements	-	3/31/2026	3/31/2061	240,341	194,246	5.070%	5.070%				186,035					
224	222		FY 2044 Subtotal:	-	-	-	240,341	194,246	-	-				186,035					
225	223	2045	Replacements	-	3/31/2026	3/31/2061	240,341	8,211	5.070%	5.070%				8,211					
226	224	2045	Replacements	-	3/31/2027	3/31/2062	245,011	245,011	5.070%	5.070%				245,011					
227	225	2045	Replacements	-	3/31/2028	3/31/2063	249,147	249,147	5.070%	5.070%				5,704					
228	226		FY 2045 Subtotal:	-	-	-	734,499	502,369	-	-				258,926					
229	227	2046	Replacements	-	3/31/2028	3/31/2063	249,147	243,443	5.070%	5.070%				243,443					
230	228	2046	Replacements	-	3/31/2029	3/31/2064	253,031	253,031	5.070%	5.070%				12,237					
231	229		FY 2046 Subtotal:	-	-	-	502,178	496,474	-	-				255,680					

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S					
2	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S					
	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal						
232	230	2047	Replacements	-	3/31/2029	3/31/2064	253,031	240,794	5.070%	5.070%									240,794					
233	231	2047	Replacements	-	3/31/2030	3/31/2065	257,142	257,142	5.070%	5.070%										11,236				
234	232	FY 2047 Subtotal:			-	-	-	510,173	497,936	-											252,030			
235	233	2048	Replacements	-	3/31/2030	3/31/2065	257,142	245,906	5.070%	5.070%										245,906				
236	234	2048	Replacements	-	3/31/2031	3/31/2066	261,208	261,208	5.070%	5.070%											2,125			
237	235	FY 2048 Subtotal:			-	-	-	518,350	507,114	-												248,031		
238	236	2049	Replacements	-	3/31/2031	3/31/2066	261,208	259,083	5.070%	5.070%											243,614			
239	237	FY 2049 Subtotal:			-	-	-	261,208	259,083	-												243,614		
240	238	2050	Replacements	-	3/31/2031	3/31/2066	261,208	15,469	5.070%	5.070%											15,469			
241	239	2050	Replacements	-	3/31/2032	3/31/2067	265,356	265,356	5.070%	5.070%											223,221			
242	240	FY 2050 Subtotal:			-	-	-	526,564	280,825	-												238,690		
243	241	2051	Replacements	-	3/31/2032	3/31/2067	265,356	42,135	5.070%	5.070%											42,135			
244	242	2051	Replacements	-	3/31/2033	3/31/2068	269,936	269,936	5.070%	5.070%											191,159			
245	243	FY 2051 Subtotal:			-	-	-	535,292	312,071	-												233,294		
246	244	Grand Total						\$13,319,994	\$10,941,502	-												\$7,885,311	\$188	\$64,493

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1		Project	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
2	Appropriation	Bonneville Power Administration	14,514	14,514	14,418	8,351	4,438	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3		Bonneville Power Administration Subtotal:	14,514	14,514	14,418	8,351	4,438	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4		Appropriation Subtotal:	14,514	14,514	14,418	8,351	4,438	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Treasury	Construction	74,019	92,520	113,361	138,624	158,492	152,528	145,606	138,341	124,498	113,951	101,306	91,770	81,364	71,167	63,209	48,807	34,662	26,596	11,786	3,189
6		Interest Accrual	15,680	19,812	25,241	30,371	29,005	28,403	26,246	22,625	20,955	18,534	17,272	15,631	12,515	9,458	7,873	6,991	4,597	2,627	846	468
7		Interest Accrual Reversal	(10,165)	(15,680)	(19,812)	(25,241)	(30,371)	(29,005)	(28,403)	(26,246)	(22,625)	(20,955)	(18,534)	(17,272)	(15,631)	(12,515)	(9,458)	(7,873)	(6,991)	(4,597)	(2,627)	(846)
8		Construction (AS)	1,546	1,503	1,612	1,931	2,398	2,344	1,985	1,597	1,146	517	-	-	-	-	-	-	-	-	-	-
9		Interest Accrual	264	329	390	467	467	401	305	229	111	-	-	-	-	-	-	-	-	-	-	-
10		Interest Accrual Reversal	(170)	(264)	(329)	(390)	(467)	(401)	(305)	(229)	(111)	-	-	-	-	-	-	-	-	-	-	-
11		Environment	935	1,256	1,486	1,789	2,130	2,130	2,130	2,130	2,130	1,959	1,789	1,575	1,362	1,362	1,034	760	533	302	-	-
12		Interest Accrual	304	304	304	304	304	304	304	304	304	304	304	268	268	191	125	-	-	-	-	-
13		Interest Accrual Reversal	(113)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(268)	(268)	(191)	(125)	-	-	-	-
14		Replacements	-	-	-	-	5,126	15,573	26,408	37,572	49,058	60,899	73,095	85,618	98,407	111,447	124,750	138,293	152,051	166,026	180,247	194,727
15		BPA Borrowing Subtotal:	80,272	98,194	120,516	145,025	164,099	166,622	168,830	171,100	170,225	169,930	169,996	172,102	172,840	175,684	182,204	181,705	179,695	185,838	185,183	193,751
16		Treasury Subtotal:	80,272	98,194	120,516	145,025	164,099	166,622	168,830	171,100	170,225	169,930	169,996	172,102	172,840	175,684	182,204	181,705	179,695	185,838	185,183	193,751
17	GRAND TOTAL:		94,786	112,708	134,934	153,375	168,536	166,622	168,830	171,100	170,225	169,930	169,996	172,102	172,840	175,684	182,204	181,705	179,695	185,838	185,183	193,751

	A	B	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
		Project	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	Total
1																						
2	Appropriation	Bonneville Power Administration	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56,234
3		Bonneville Power Administration Subtotal:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56,234
4		Appropriation Subtotal:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56,234
5	Treasury	Construction	1,213	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,787,010
6		Interest Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	315,149
7		Interest Accrual Reversal	(468)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(325,314)
8		Construction (AS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16,580
9		Interest Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,963
10		Interest Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3,133)
11		Environment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26,790
12		Interest Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,192
13		Interest Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(4,305)
14		Replacements	205,433	209,695	211,590	217,946	229,682	241,874	253,070	265,254	278,006	291,682	303,916	311,294	317,226	323,678	330,679	338,306	346,601	355,546	365,131	6,915,905
15		BPA Borrowing Subtotal:	201,548	204,658	206,556	215,054	227,227	238,929	249,798	262,548	274,743	289,151	299,581	305,926	311,896	318,391	325,437	333,112	341,462	350,466	360,115	8,570,408
16		Treasury Subtotal:	201,548	204,658	206,556	215,054	227,227	238,929	249,798	262,548	274,743	289,151	299,581	305,926	311,896	318,391	325,437	333,112	341,462	350,466	360,115	8,570,408
17	GRAND TOTAL:		201,548	204,658	206,556	215,054	227,227	238,929	249,798	262,548	274,743	289,151	299,581	305,926	311,896	318,391	325,437	333,112	341,462	350,466	360,115	8,626,642

	A	B	C	D	E	F	G	H	I	J	K
		A	B	C	D	E	F	G	H		
			Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total
1											
2											
3	1										
4	2		2014	Bonneville Power	Historical	200,612	7.235%	14,514	-	-	14,514
5	3		2014	Construction	Historical	1,611,040	4.020%	64,757	-	-	64,757
6	4		2014	Construction	New	796,890	1.162%	9,263	-	5,514	14,777
7	5		2014	Construction (AS)	Historical	85,100	1.612%	1,372	-	-	1,372
8	6		2014	Construction (AS)	New	77,971	0.224%	174	-	94	268
9	7		2014	Environment	Historical	23,000	2.848%	655	-	-	655
10	8		2014	Environment	New	17,000	1.644%	280	-	191	471
11	9		2014	Float	Historical	-	-	(2,027)	-	-	(2,027)
12	10			FY 2014 Subtotal:		2,811,614		88,987	-	5,799	94,786
13	11		2015	Bonneville Power	Historical	200,612	7.235%	14,514	-	-	14,514
14	12		2015	Construction	Historical	2,458,930	3.582%	88,088	-	(4)	88,084
15	13		2015	Construction	New	518,000	0.856%	4,433	-	4,135	8,568
16	14		2015	Construction (AS)	Historical	94,147	1.515%	1,426	-	(19)	1,408
17	15		2015	Construction (AS)	New	13,650	0.566%	77	-	83	161
18	16		2015	Environment	Historical	40,000	3.140%	1,256	-	-	1,256
19	17		2015	Float	Historical	-	-	(1,282)	-	-	(1,282)
20	18			FY 2015 Subtotal:		3,325,339		108,511	-	4,197	112,708
21	19		2016	Bonneville Power	Historical	199,293	7.235%	14,418	-	-	14,418
22	20		2016	Construction	Historical	2,908,930	3.746%	108,958	-	-	108,958
23	21		2016	Construction	New	506,000	0.870%	4,402	-	5,430	9,832
24	22		2016	Construction (AS)	Historical	81,097	1.849%	1,499	-	(80)	1,420
25	23		2016	Construction (AS)	New	14,950	0.754%	113	-	141	253
26	24		2016	Environment	Historical	46,000	3.231%	1,486	-	-	1,486
27	25		2016	Float	Historical	-	-	(1,434)	-	-	(1,434)
28	26			FY 2016 Subtotal:		3,756,270		129,443	-	5,491	134,934
29	27		2017	Bonneville Power	Historical	115,624	7.222%	8,351	-	-	8,351
30	28		2017	Construction	Historical	3,481,930	3.851%	134,095	-	(698)	133,398
31	29		2017	Construction	New	463,000	0.978%	4,529	-	5,827	10,357
32	30		2017	Construction (AS)	Historical	79,797	2.253%	1,798	-	(34)	1,764
33	31		2017	Construction (AS)	New	11,700	1.138%	133	-	111	244
34	32		2017	Environment	Historical	53,000	3.375%	1,789	-	-	1,789
35	33		2017	Float	Historical	-	-	(2,526)	-	-	(2,526)
36	34			FY 2017 Subtotal:		4,205,050		148,169	-	5,207	153,375
37	35		2018	Bonneville Power	Historical	61,514	7.214%	4,438	-	-	4,438
38	36		2018	Construction	Historical	3,969,430	3.993%	158,492	-	(1,366)	157,126
39	37		2018	Construction (AS)	Historical	89,547	2.677%	2,398	-	-	2,398
40	38		2018	Environment	Historical	60,000	3.549%	2,130	-	-	2,130
41	39		2018	Replacements	New	195,278	2.625%	5,126	-	-	5,126
42	40		2018	Float	Historical	-	-	(2,681)	-	-	(2,681)
43	41			FY 2018 Subtotal:		4,375,768		169,903	-	(1,366)	168,536
44	42		2019	Construction	Historical	3,928,995	3.882%	152,528	-	(602)	151,926
45	43		2019	Construction (AS)	Historical	89,547	2.617%	2,344	-	(67)	2,277
46	44		2019	Environment	Historical	60,000	3.549%	2,130	-	-	2,130
47	45		2019	Replacements	Historical	195,278	5.250%	10,252	-	-	10,252
48	46		2019	Replacements	New	202,689	2.625%	5,321	-	-	5,321
49	47		2019	Float	Historical	-	-	(5,283)	-	-	(5,283)
50	48			FY 2019 Subtotal:		4,476,508		167,291	-	(669)	166,622
51	49		2020	Construction	Historical	3,654,417	3.984%	145,606	-	(2,157)	143,449
52	50		2020	Construction (AS)	Historical	71,797	2.765%	1,985	-	(96)	1,890
53	51		2020	Environment	Historical	60,000	3.549%	2,130	-	-	2,130
54	52		2020	Replacements	Historical	397,967	5.250%	20,893	-	-	20,893
55	53		2020	Replacements	New	210,104	2.625%	5,515	-	-	5,515
56	54		2020	Float	Historical	-	-	(5,047)	-	-	(5,047)
57	55			FY 2020 Subtotal:		4,394,284		171,083	-	(2,252)	168,830
58	56		2021	Construction	Historical	3,405,840	4.062%	138,341	-	(3,621)	134,720
59	57		2021	Construction (AS)	Historical	48,750	3.276%	1,597	-	(75)	1,522
60	58		2021	Environment	Historical	60,000	3.549%	2,130	-	-	2,130
61	59		2021	Replacements	Historical	608,071	5.250%	31,924	-	-	31,924
62	60		2021	Replacements	New	215,186	2.625%	5,649	-	-	5,649
63	61		2021	Float	Historical	-	-	(4,843)	-	-	(4,843)
64	62			FY 2021 Subtotal:		4,337,847		174,796	-	(3,696)	171,100

	A	B	C	D	E	F	G	H	I	J	K
	A	B	C	D	E	F	G	H			
1											
2											
3	1	Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total	
65	63	2022	Construction	Historical	3,164,746	3.934%	124,498	-	(1,671)	122,827	
66	64	2022	Construction (AS)	Historical	32,500	3.527%	1,146	-	(118)	1,028	
67	65	2022	Environment	Historical	60,000	3.549%	2,130	-	-	2,130	
68	66	2022	Replacements	Historical	823,257	5.250%	43,221	-	-	43,221	
69	67	2022	Replacements	New	222,367	2.625%	5,837	-	-	5,837	
70	68	2022	Float	Historical	-	-	(4,818)	-	-	(4,818)	
71	69	FY 2022 Subtotal:			4,302,870		172,015	-	(1,789)	170,225	
72	70	2023	Construction	Historical	2,919,509	3.903%	113,951	-	(2,421)	111,531	
73	71	2023	Construction (AS)	Historical	14,300	3.617%	517	-	(111)	406	
74	72	2023	Environment	Historical	60,000	3.265%	1,959	-	-	1,959	
75	73	2023	Replacements	Historical	1,045,624	5.250%	54,895	-	-	54,895	
76	74	2023	Replacements	New	228,727	2.625%	6,004	-	-	6,004	
77	75	2023	Float	Historical	-	-	(4,865)	-	-	(4,865)	
78	76	FY 2023 Subtotal:			4,268,160		172,462	-	(2,532)	169,930	
79	77	2024	Construction	Historical	2,668,493	3.796%	101,306	-	(1,262)	100,044	
80	78	2024	Environment	Historical	53,000	3.375%	1,789	-	-	1,789	
81	79	2024	Replacements	Historical	1,274,351	5.250%	66,903	-	-	66,903	
82	80	2024	Replacements	New	235,874	2.625%	6,192	-	-	6,192	
83	81	2024	Float	Historical	-	-	(4,932)	-	-	(4,932)	
84	82	FY 2024 Subtotal:			4,231,718		171,258	-	(1,262)	169,996	
85	83	2025	Construction	Historical	2,398,144	3.827%	91,770	-	(1,641)	90,129	
86	84	2025	Environment	Historical	53,000	2.971%	1,575	-	(36)	1,539	
87	85	2025	Replacements	Historical	1,510,225	5.250%	79,287	-	-	79,287	
88	86	2025	Replacements	New	241,196	2.625%	6,331	-	-	6,331	
89	87	2025	Float	Historical	-	-	(5,184)	-	-	(5,184)	
90	88	FY 2025 Subtotal:			4,202,565		173,779	-	(1,677)	172,102	
91	89	2026	Construction	Historical	2,124,824	3.829%	81,364	-	(3,116)	78,248	
92	90	2026	Environment	Historical	43,000	3.167%	1,362	-	-	1,362	
93	91	2026	Replacements	Historical	1,751,421	5.250%	91,950	-	-	91,950	
94	92	2026	Replacements	New	245,991	2.625%	6,457	-	-	6,457	
95	93	2026	Float	Historical	-	-	(5,177)	-	-	(5,177)	
96	94	FY 2026 Subtotal:			4,165,236		175,956	-	(3,116)	172,840	
97	95	2027	Construction	Historical	1,845,168	3.857%	71,167	-	(3,056)	68,110	
98	96	2027	Environment	Historical	43,000	3.167%	1,362	-	(77)	1,285	
99	97	2027	Replacements	Historical	1,997,412	5.250%	104,864	-	-	104,864	
100	98	2027	Replacements	New	250,787	2.625%	6,583	-	-	6,583	
101	99	2027	Float	Historical	-	-	(5,159)	-	-	(5,159)	
102	100	FY 2027 Subtotal:			4,136,367		178,816	-	(3,133)	175,684	
103	101	2028	Construction	Historical	1,581,168	3.998%	63,209	-	(1,585)	61,624	
104	102	2028	Environment	Historical	30,000	3.448%	1,034	-	(66)	968	
105	103	2028	Replacements	Historical	2,248,199	5.250%	118,030	-	-	118,030	
106	104	2028	Replacements	New	255,968	2.625%	6,719	-	-	6,719	
107	105	2028	Float	Historical	-	-	(5,137)	-	-	(5,137)	
108	106	FY 2028 Subtotal:			4,115,335		183,856	-	(1,652)	182,204	
109	107	2029	Construction	Historical	1,315,485	3.710%	48,807	-	(882)	47,925	
110	108	2029	Environment	Historical	25,000	3.041%	760	-	(125)	636	
111	109	2029	Replacements	Historical	2,504,167	5.250%	131,469	-	-	131,469	
112	110	2029	Replacements	New	259,963	2.625%	6,824	-	-	6,824	
113	111	2029	Float	Historical	-	-	(5,149)	-	-	(5,149)	
114	112	FY 2029 Subtotal:			4,104,614		182,712	-	(1,007)	181,705	
115	113	2030	Construction	Historical	1,056,096	3.282%	34,662	-	(2,394)	32,268	
116	114	2030	Environment	Historical	13,000	4.098%	533	-	-	533	
117	115	2030	Replacements	Historical	2,764,130	5.250%	145,117	-	-	145,117	
118	116	2030	Replacements	New	264,141	2.625%	6,934	-	-	6,934	
119	117	2030	Float	Historical	-	-	(5,157)	-	-	(5,157)	
120	118	FY 2030 Subtotal:			4,097,366		182,089	-	(2,394)	179,695	
121	119	2031	Construction	Historical	786,692	3.381%	26,596	-	(1,969)	24,626	
122	120	2031	Environment	Historical	7,000	4.320%	302	-	-	302	
123	121	2031	Replacements	Historical	3,028,270	5.250%	158,984	-	-	158,984	
124	122	2031	Replacements	New	268,275	2.625%	7,042	-	-	7,042	
125	123	2031	Float	Historical	-	-	(5,117)	-	-	(5,117)	
126	124	FY 2031 Subtotal:			4,090,237		187,808	-	(1,969)	185,838	

	A	B	C	D	E	F	G	H	I	J	K	
1	A		B		C		D		E		F	
2	A		B		C		D		E		F	
3	1	Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total		
127	125	2032	Construction	Historical	525,975	2.241%	11,786	-	(1,782)	10,004		
128	126	2032	Replacements	Historical	3,296,546	5.250%	173,069	-	-	173,069		
129	127	2032	Replacements	New	273,453	2.625%	7,178	-	-	7,178		
130	128	2032	Float	Historical	-	-	(5,068)	-	-	(5,068)		
131	129	FY 2032 Subtotal:			4,095,973		186,965	-	(1,782)	185,183		
132	130	2033	Construction	Historical	253,981	1.255%	3,189	-	(377)	2,811		
133	131	2033	Replacements	Historical	3,569,998	5.250%	187,425	-	-	187,425		
134	132	2033	Replacements	New	278,179	2.625%	7,302	-	-	7,302		
135	133	2033	Float	Historical	-	-	(3,788)	-	-	(3,788)		
136	134	FY 2033 Subtotal:			4,102,159		194,128	-	(377)	193,751		
137	135	2034	Construction	Historical	73,422	1.652%	1,213	-	(468)	745		
138	136	2034	Replacements	Historical	3,848,177	5.146%	198,013	-	-	198,013		
139	137	2034	Replacements	New	282,664	2.625%	7,420	-	-	7,420		
140	138	2034	Float	Historical	-	-	(4,629)	-	-	(4,629)		
141	139	FY 2034 Subtotal:			4,204,264		202,017	-	(468)	201,548		
142	140	2035	Construction	Historical	-	-	-	-	-	-		
143	141	2035	Replacements	Historical	3,977,846	5.082%	202,145	-	-	202,145		
144	142	2035	Replacements	New	287,600	2.625%	7,550	-	-	7,550		
145	143	2035	Float	Historical	-	-	(5,036)	-	-	(5,036)		
146	144	FY 2035 Subtotal:			4,265,447		204,658	-	-	204,658		
147	145	2036	Replacements	Historical	4,010,523	5.084%	203,905	-	-	203,905		
148	146	2036	Replacements	New	292,745	2.625%	7,685	-	-	7,685		
149	147	2036	Float	Historical	-	-	(5,034)	-	-	(5,034)		
150	148	FY 2036 Subtotal:			4,303,268		206,556	-	-	206,556		
151	149	2037	Replacements	Historical	4,050,037	5.188%	210,135	-	-	210,135		
152	150	2037	Replacements	New	297,546	2.625%	7,811	-	-	7,811		
153	151	2037	Float	Historical	-	-	(2,892)	-	-	(2,892)		
154	152	FY 2037 Subtotal:			4,347,583		215,054	-	-	215,054		
155	153	2038	Replacements	Historical	4,252,660	5.215%	221,759	-	-	221,759		
156	154	2038	Replacements	New	301,827	2.625%	7,923	-	-	7,923		
157	155	2038	Float	Historical	-	-	(2,456)	-	-	(2,456)		
158	156	FY 2038 Subtotal:			4,554,487		227,227	-	-	227,227		
159	157	2039	Replacements	Historical	4,497,142	5.199%	233,828	-	-	233,828		
160	158	2039	Replacements	New	306,532	2.625%	8,046	-	-	8,046		
161	159	2039	Float	Historical	-	-	(2,946)	-	-	(2,946)		
162	160	FY 2039 Subtotal:			4,803,674		238,929	-	-	238,929		
163	161	2040	Replacements	Historical	4,717,111	5.192%	244,908	-	-	244,908		
164	162	2040	Replacements	New	310,943	2.625%	8,162	-	-	8,162		
165	163	2040	Float	Historical	-	-	(3,271)	-	-	(3,271)		
166	164	FY 2040 Subtotal:			5,028,054		249,798	-	-	249,798		
167	165	2041	Replacements	Historical	4,923,643	5.219%	256,986	-	-	256,986		
168	166	2041	Replacements	New	314,969	2.625%	8,268	-	-	8,268		
169	167	2041	Float	Historical	-	-	(2,707)	-	-	(2,707)		
170	168	FY 2041 Subtotal:			5,238,612		262,548	-	-	262,548		
171	169	2042	Replacements	Historical	5,181,285	5.204%	269,627	-	-	269,627		
172	170	2042	Replacements	New	319,181	2.625%	8,379	-	-	8,379		
173	171	2042	Float	Historical	-	-	(3,263)	-	-	(3,263)		
174	172	FY 2042 Subtotal:			5,500,467		274,743	-	-	274,743		
175	173	2043	Replacements	Historical	5,409,404	5.235%	283,178	-	-	283,178		
176	174	2043	Replacements	New	323,949	2.625%	8,504	-	-	8,504		
177	175	2043	Float	Historical	-	-	(2,531)	-	-	(2,531)		
178	176	FY 2043 Subtotal:			5,733,353		289,151	-	-	289,151		
179	177	2044	Replacements	Historical	5,702,288	5.178%	295,291	-	-	295,291		
180	178	2044	Replacements	New	328,544	2.625%	8,624	-	-	8,624		
181	179	2044	Float	Historical	-	-	(4,335)	-	-	(4,335)		
182	180	FY 2044 Subtotal:			6,030,832		299,581	-	-	299,581		
183	181	2045	Replacements	Historical	5,875,453	5.149%	302,521	-	-	302,521		
184	182	2045	Replacements	New	334,222	2.625%	8,773	-	-	8,773		
185	183	2045	Float	Historical	-	-	(5,368)	-	-	(5,368)		
186	184	FY 2045 Subtotal:			6,209,675		305,926	-	-	305,926		
187	185	2046	Replacements	Historical	5,983,362	5.153%	308,338	-	-	308,338		
188	186	2046	Replacements	New	338,574	2.625%	8,888	-	-	8,888		
189	187	2046	Float	Historical	-	-	(5,330)	-	-	(5,330)		
190	188	FY 2046 Subtotal:			6,321,936		311,896	-	-	311,896		
191	189	2047	Replacements	Historical	6,101,419	5.158%	314,703	-	-	314,703		
192	190	2047	Replacements	New	341,921	2.625%	8,975	-	-	8,975		
193	191	2047	Float	Historical	-	-	(5,288)	-	-	(5,288)		
194	192	FY 2047 Subtotal:			6,443,340		318,391	-	-	318,391		

	A	B	C	D	E	F	G	H	I	J	K
1	A										
2	B										
3	C										
4	D										
5	E										
6	F										
7	G										
8	H										
9	1	Fiscal Year	Project	Type	Principal	Rate	Interest	Premium	Accrual	Total	
195	193	2048	Replacements	Historical	6,229,186	5.163%	321,591	-	-	321,591	
196	194	2048	Replacements	New	346,218	2.625%	9,088	-	-	9,088	
197	195	2048	Float	Historical	-	-	(5,242)	-	-	(5,242)	
198	196	FY 2048 Subtotal:			6,575,404		325,437	-	-	325,437	
199	197	2049	Replacements	Historical	6,368,125	5.168%	329,082	-	-	329,082	
200	198	2049	Replacements	New	351,395	2.625%	9,224	-	-	9,224	
201	199	2049	Float	Historical	-	-	(5,194)	-	-	(5,194)	
202	200	FY 2049 Subtotal:			6,719,520		333,112	-	-	333,112	
203	201	2050	Replacements	Historical	6,519,711	5.173%	337,254	-	-	337,254	
204	202	2050	Replacements	New	356,081	2.625%	9,347	-	-	9,347	
205	203	2050	Float	Historical	-	-	(5,140)	-	-	(5,140)	
206	204	FY 2050 Subtotal:			6,875,792		341,462	-	-	341,462	
207	205	2051	Replacements	Historical	6,684,147	5.178%	346,120	-	-	346,120	
208	206	2051	Replacements	New	359,069	2.625%	9,426	-	-	9,426	
209	207	2051	Float	Historical	-	-	(5,080)	-	-	(5,080)	
210	208	FY 2051 Subtotal:			7,043,216		350,466	-	-	350,466	
211	209	2052	Replacements	Historical	6,860,456	5.184%	355,627	-	-	355,627	
212	210	2052	Replacements	New	362,056	2.625%	9,504	-	-	9,504	
213	211	2052	Float	Historical	-	-	(5,016)	-	-	(5,016)	
214	212	FY 2052 Subtotal:			7,222,512		360,115	-	-	360,115	
215	213	Grand Total:			\$189,016,715		\$8,637,090	-	(\$10,448)	\$8,626,642	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Obligation Type	General Project	Specific Project	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
2	Appropriation	Bonneville Power Administration	Bonneville Power Administration	-	1,319	83,670	54,110	61,514	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3			Bonneville Power Administration Subtotal:	-	1,319	83,670	54,110	61,514	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4		Appropriation Subtotal:		-	1,319	83,670	54,110	61,514	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Bond	BPA Borrowing	Construction	14,000	137,000	-	36,400	40,207	272,667	248,577	241,094	241,116	239,047	265,919	270,207	279,656	264,000	265,684	259,389	267,568	260,586	268,443
6			Principal Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7			Principal Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8			Construction (AS)	73,050	29,300	19,500	4,550	-	17,750	23,047	16,250	18,200	14,300	-	-	-	-	-	-	-	-	-
9			Principal Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10			Principal Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11			Environment	-	-	-	-	-	-	-	-	-	7,000	-	10,000	-	13,000	5,000	12,000	6,000	7,000	-
12			Principal Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13			Principal Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14			Replacements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15			Principal Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16			Principal Accrual Reversal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17			BPA Borrowing Subtotal:	87,050	166,300	19,500	40,950	40,207	290,417	271,624	257,344	259,316	260,347	265,919	280,207	279,656	277,000	270,684	271,389	273,568	267,586	268,443
18		Make Whole Call	Discounts	-	-	-	-	(100)	(227)	(1,911)	-	-	(4,121)	(11,969)	(4,430)	(3,113)	-	-	-	-	(1,836)	(131)
19			Premiums	-	-	-	-	182	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20			Make Whole Call Subtotal:	-	-	-	-	82	(227)	(1,911)	-	-	(4,121)	(11,969)	(4,430)	(3,113)	-	-	-	-	(1,836)	(131)
21		Bond Subtotal:		87,050	166,300	19,500	40,950	40,308	290,644	273,534	257,344	259,316	264,468	277,888	284,636	282,769	277,000	270,684	271,389	273,568	269,422	268,574
22	Grand Total:			\$87,050	\$167,619	\$103,170	\$95,060	\$101,821	\$290,644	\$273,534	\$257,344	\$259,316	\$264,468	\$277,888	\$284,636	\$282,769	\$277,000	\$270,684	\$271,389	\$273,568	\$269,422	\$268,574

	A	B	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1	Obligation Type	General Project	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	Total
2	Appropriation	Bonneville Power Administration	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200,612
3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200,612
4		Appropriation Subtotal:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200,612
5	Bond	BPA Borrowing	169,945	73,422	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,114,927
6			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	215,947
9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60,000
12			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14			-	152,995	254,923	253,231	94,924	57,344	86,563	104,411	57,327	91,062	31,065	155,379	226,313	220,516	214,154	207,279	199,809	191,646	182,760	173,230	2,954,932
15			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17			169,945	226,417	254,923	253,231	94,924	57,344	86,563	104,411	57,327	91,062	31,065	155,379	226,313	220,516	214,154	207,279	199,809	191,646	182,760	173,230	7,345,806
18		Make Whole Call	(3,550)	(10,614)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(42,003)
19			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182
20			(3,550)	(10,614)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(41,821)
21		Bond Subtotal:	173,495	237,031	254,923	253,231	94,924	57,344	86,563	104,411	57,327	91,062	31,065	155,379	226,313	220,516	214,154	207,279	199,809	191,646	182,760	173,230	7,303,985
22		Grand Total:	\$173,495	\$237,031	\$254,923	\$253,231	\$94,924	\$57,344	\$86,563	\$104,411	\$57,327	\$91,062	\$31,065	\$155,379	\$226,313	\$220,516	\$214,154	\$207,279	\$199,809	\$191,646	\$182,760	\$173,230	\$7,504,597

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
2	A		B		C		D		E		F		G		H		I		J	
3	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal		
3	1	2014	Construction (AS)	-	2/28/2014	9/30/2014	59,050	59,050	0.117%	0.117%				59,050						
4	2	2014	Construction	-	11/20/2013	9/30/2014	14,000	14,000	0.140%	0.140%				14,000						
5	3	2014	Construction (AS)	-	9/30/2009	9/30/2014	14,000	14,000	2.746%	2.746%				14,000						
6	4	FY 2014 Subtotal:		-	-	-	87,050	87,050	-	-	-	-	-	87,050						
7	5	2015	Construction	-	6/30/2014	6/30/2015	11,000	11,000	0.303%	0.303%				11,000						
8	6	2015	Construction	-	6/30/2014	6/30/2015	63,000	63,000	0.303%	0.303%				63,000						
9	7	2015	Construction (AS)	-	8/31/2010	8/31/2015	15,000	15,000	1.619%	1.619%				15,000						
10	8	2015	Construction	-	8/20/2012	8/31/2015	37,000	37,000	0.589%	0.589%				37,000						
11	9	2015	Construction	-	6/20/2012	9/30/2015	26,000	26,000	0.671%	0.671%				26,000						
12	10	2015	Construction (AS)	-	6/20/2012	9/30/2015	14,300	14,300	0.671%	0.671%				14,300						
13	11	2015	Bonneville Power Administration	Bonneville Power Administration	9/30/1974	9/30/2019	12,563	6,522	7.270%	7.270%				1,319						
14	12	FY 2015 Subtotal:		-	-	-	178,863	172,822	-	-	-	-	-	167,619						
15	13	2016	Construction (AS)	-	6/22/2011	6/30/2016	13,000	13,000	1.957%	1.957%				13,000						
16	14	2016	Construction (AS)	-	8/12/2011	8/31/2016	6,500	6,500	1.423%	1.423%				6,500						
17	15	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1974	9/30/2019	12,563	5,203	7.270%	7.270%				5,203						
18	16	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	32,026	32,026	7.250%	7.250%				27,650						
19	17	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	21,916	21,916	7.250%	7.250%				21,916						
20	18	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	17,158	17,158	7.250%	7.250%				17,158						
21	19	2016	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	11,742	11,742	7.250%	7.250%				11,742						
22	20	FY 2016 Subtotal:		-	-	-	114,905	107,545	-	-	-	-	-	103,170						
23	21	2017	Construction (AS)	-	4/30/2013	4/30/2017	4,550	4,550	0.622%	0.622%				4,550						
24	22	2017	Construction	-	9/30/2012	9/30/2017	36,400	36,400	0.891%	0.891%				36,400						
25	23	2017	Bonneville Power Administration	Bonneville Power Administration	9/30/1975	9/30/2020	32,026	4,376	7.250%	7.250%				4,376						
26	24	2017	Bonneville Power Administration	Bonneville Power Administration	9/30/1976	9/30/2021	61,025	61,025	7.230%	7.230%				47,522						
27	25	2017	Bonneville Power Administration	Bonneville Power Administration	9/30/1976	9/30/2021	2,212	2,212	7.230%	7.230%				2,212						
28	26	FY 2017 Subtotal:		-	-	-	136,213	108,563	-	-	-	-	-	95,060						
29	27	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1976	9/30/2021	61,025	13,503	7.230%	7.230%				13,503						
30	28	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	3,948	3,948	7.210%	7.210%				3,948						
31	29	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	5,380	5,380	7.210%	7.210%				5,380						
32	30	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	33,702	33,702	7.210%	7.210%				33,702						
33	31	2018	Bonneville Power Administration	Bonneville Power Administration	9/30/1977	9/30/2022	4,981	4,981	7.210%	7.210%				4,981						
34	32	2018	Construction	-	1/31/2011	1/31/2036	50,000	50,000	4.952%	4.952%				5,207		100				
35	33	2018	Construction	-	6/30/2009	6/30/2039	35,000	35,000	5.192%	5.192%				35,000	182					
36	34	FY 2018 Subtotal:		-	-	-	194,036	146,514	-	-	-	-	-	101,721	182	100				
37	35	2019	Construction (AS)	-	11/30/2012	11/30/2018	9,750	9,750	1.109%	1.109%				9,750						
38	36	2019	Construction	-	1/16/2014	12/31/2018	33,000	33,000	1.943%	1.943%				33,000						
39	37	2019	Construction	-	1/16/2014	12/31/2018	30,000	30,000	1.943%	1.943%				30,000						
40	38	2019	Construction	-	1/16/2014	12/31/2018	31,000	31,000	1.943%	1.943%				31,000						
41	39	2019	Construction	-	1/16/2014	12/31/2018	48,000	48,000	1.943%	1.943%				48,000						
42	40	2019	Construction (AS)	-	6/30/2013	6/30/2019	5,000	5,000	1.962%	1.962%				5,000						
43	41	2019	Construction (AS)	-	8/31/2013	8/31/2019	3,000	3,000	2.279%	2.279%				3,000						
44	42	2019	Construction	-	1/31/2011	1/31/2036	50,000	44,692	4.952%	4.952%				11,667		227				
45	43	2019	Construction	-	8/31/2017	8/31/2037	58,000	58,000	5.000%	5.000%				58,000						
46	44	2019	Construction	-	9/30/2017	9/30/2037	61,000	61,000	5.000%	5.000%				61,000						
47	45	FY 2019 Subtotal:		-	-	-	328,750	323,442	-	-	-	-	-	290,417		227				
48	46	2020	Construction (AS)	-	10/31/2013	10/31/2019	7,800	7,800	2.039%	2.039%				7,800						
49	47	2020	Construction	-	10/31/2009	10/31/2019	43,000	43,000	3.842%	3.842%				43,000						
50	48	2020	Construction (AS)	-	1/31/2014	1/31/2020	3,250	3,250	2.183%	2.183%				3,250						
51	49	2020	Construction	-	1/31/2009	1/31/2020	50,000	50,000	3.830%	3.830%				50,000						
52	50	2020	Construction (AS)	-	4/30/2014	3/31/2020	2,600	2,600	1.757%	1.757%				2,600						
53	51	2020	Construction (AS)	-	5/31/2014	4/30/2020	1,300	1,300	1.757%	1.757%				1,300						
54	52	2020	Construction (AS)	-	7/31/2014	7/31/2020	1,950	1,950	1.757%	1.757%				1,950						
55	53	2020	Construction	-	7/31/2010	7/31/2020	50,000	50,000	3.118%	3.118%				50,000						
56	54	2020	Construction (AS)	-	8/31/2014	8/31/2020	2,021	2,021	1.757%	1.757%				2,021						
57	55	2020	Construction (AS)	-	9/30/2014	9/30/2020	4,125	4,125	1.757%	1.757%				4,125						
58	56	2020	Construction	-	4/30/2017	4/30/2033	46,000	46,000	4.900%	4.900%				19,690						
59	57	2020	Construction	-	1/31/2011	1/31/2036	50,000	32,798	4.952%	4.952%				32,232		566				
60	58	2020	Construction	-	2/28/2011	2/28/2038	55,000	55,000	4.935%	4.935%				53,655		1,345				
61	59	FY 2020 Subtotal:		-	-	-	317,047	299,844	-	-	-	-	-	271,624		1,911				

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
62	60	2021	Construction (AS)	-	10/31/2014	10/31/2020	1,300	1,300	1.757%	1.757%				1,300					
63	61	2021	Construction (AS)	-	11/30/2014	11/30/2020	1,300	1,300	2.530%	2.530%				1,300					
64	62	2021	Construction (AS)	-	12/31/2014	12/31/2020	1,300	1,300	2.530%	2.530%				1,300					
65	63	2021	Construction (AS)	-	1/31/2015	1/31/2021	650	650	2.530%	2.530%				650					
66	64	2021	Construction (AS)	-	2/28/2015	2/28/2021	1,300	1,300	2.530%	2.530%				1,300					
67	65	2021	Construction (AS)	-	3/31/2015	3/31/2021	1,300	1,300	2.530%	2.530%				1,300					
68	66	2021	Construction	-	3/31/2010	3/31/2021	15,000	15,000	4.188%	4.188%				15,000					
69	67	2021	Construction (AS)	-	4/30/2015	4/30/2021	1,300	1,300	2.530%	2.530%				1,300					
70	68	2021	Construction	-	4/30/2010	4/30/2021	22,000	22,000	4.094%	4.094%				22,000					
71	69	2021	Construction	-	5/31/2010	5/31/2021	22,000	22,000	3.694%	3.694%				22,000					
72	70	2021	Construction (AS)	-	5/31/2015	5/31/2021	1,300	1,300	2.530%	2.530%				1,300					
73	71	2021	Construction (AS)	-	6/30/2015	6/30/2021	1,300	1,300	2.530%	2.530%				1,300					
74	72	2021	Construction	-	6/30/2010	6/30/2021	22,000	22,000	3.374%	3.374%				22,000					
75	73	2021	Construction (AS)	-	7/31/2015	7/31/2021	1,300	1,300	2.530%	2.530%				1,300					
76	74	2021	Construction (AS)	-	8/31/2015	8/31/2021	1,300	1,300	2.530%	2.530%				1,300					
77	75	2021	Construction (AS)	-	9/30/2015	9/30/2021	2,600	2,600	2.530%	2.530%				2,600					
78	76	2021	Construction	-	10/31/2016	10/31/2031	38,000	38,000	4.870%	4.870%				38,000					
79	77	2021	Construction	-	11/30/2016	11/30/2031	23,000	23,000	4.870%	4.870%				23,000					
80	78	2021	Construction	-	12/31/2016	12/31/2031	45,000	45,000	4.870%	4.870%				19,784					
81	79	2021	Construction	-	4/30/2017	4/30/2033	46,000	26,310	4.900%	4.900%				26,310					
82	80	2021	Construction	-	5/31/2017	5/31/2033	53,000	53,000	4.900%	4.900%				53,000					
83	81		FY 2021 Subtotal:	-	-	-	302,250	282,560	-	-	-	-	-	257,344					
84	82	2022	Construction (AS)	-	10/31/2015	10/31/2021	1,300	1,300	3.470%	3.470%				1,300					
85	83	2022	Construction (AS)	-	11/30/2015	11/30/2021	1,300	1,300	3.470%	3.470%				1,300					
86	84	2022	Construction (AS)	-	12/31/2015	12/31/2021	1,300	1,300	3.470%	3.470%				1,300					
87	85	2022	Construction (AS)	-	1/31/2016	1/31/2022	1,300	1,300	3.470%	3.470%				1,300					
88	86	2022	Construction	-	1/31/2009	1/31/2022	20,000	20,000	4.200%	4.200%				20,000					
89	87	2022	Construction (AS)	-	2/28/2016	2/28/2022	1,300	1,300	3.470%	3.470%				1,300					
90	88	2022	Construction (AS)	-	3/31/2016	3/31/2022	1,300	1,300	3.470%	3.470%				1,300					
91	89	2022	Construction (AS)	-	4/30/2016	4/30/2022	1,300	1,300	3.470%	3.470%				1,300					
92	90	2022	Construction	-	4/30/2009	4/30/2022	35,000	35,000	4.253%	4.253%				35,000					
93	91	2022	Construction (AS)	-	5/31/2016	5/31/2022	1,300	1,300	3.470%	3.470%				1,300					
94	92	2022	Construction (AS)	-	6/30/2016	6/30/2022	1,950	1,950	3.470%	3.470%				1,950					
95	93	2022	Construction (AS)	-	7/31/2016	7/31/2022	1,300	1,300	3.470%	3.470%				1,300					
96	94	2022	Construction	-	7/31/2010	7/31/2022	30,000	30,000	3.372%	3.372%				30,000					
97	95	2022	Construction (AS)	-	8/31/2016	8/31/2022	1,300	1,300	3.470%	3.470%				1,300					
98	96	2022	Construction	-	8/31/2010	8/31/2022	20,000	20,000	3.029%	3.029%				20,000					
99	97	2022	Construction (AS)	-	9/30/2016	9/30/2022	3,250	3,250	3.470%	3.470%				3,250					
100	98	2022	Construction	-	12/31/2016	12/31/2031	45,000	25,216	4.870%	4.870%				25,216					
101	99	2022	Construction	-	1/31/2017	1/31/2032	30,000	30,000	4.870%	4.870%				30,000					
102	100	2022	Construction	-	2/28/2017	2/29/2032	36,000	36,000	4.870%	4.870%				36,000					
103	101	2022	Construction	-	3/31/2017	3/31/2032	50,000	50,000	4.870%	4.870%				44,900					
104	102		FY 2022 Subtotal:	-	-	-	284,200	264,416	-	-	-	-	-	259,316					
105	103	2023	Construction (AS)	-	10/31/2016	10/31/2022	650	650	4.550%	4.550%				650					
106	104	2023	Construction (AS)	-	11/30/2016	11/30/2022	1,300	1,300	4.550%	4.550%				1,300					
107	105	2023	Construction (AS)	-	12/31/2016	12/31/2022	650	650	4.550%	4.550%				650					
108	106	2023	Construction (AS)	-	1/31/2017	1/31/2023	650	650	4.550%	4.550%				650					
109	107	2023	Construction (AS)	-	2/28/2017	2/28/2023	1,300	1,300	4.550%	4.550%				1,300					
110	108	2023	Construction (AS)	-	3/31/2017	3/31/2023	1,300	1,300	4.550%	4.550%				1,300					
111	109	2023	Construction (AS)	-	4/30/2017	4/30/2023	650	650	4.550%	4.550%				650					
112	110	2023	Construction (AS)	-	5/31/2017	5/31/2023	1,300	1,300	4.550%	4.550%				1,300					
113	111	2023	Construction (AS)	-	6/30/2017	6/30/2023	1,300	1,300	4.550%	4.550%				1,300					
114	112	2023	Construction (AS)	-	7/31/2017	7/31/2023	1,300	1,300	4.550%	4.550%				1,300					
115	113	2023	Construction (AS)	-	8/31/2017	8/31/2023	1,300	1,300	4.550%	4.550%				1,300					
116	114	2023	Construction (AS)	-	9/30/2017	9/30/2023	2,600	2,600	4.550%	4.550%				2,600					
117	115	2023	Construction	-	9/30/2010	9/30/2023	46,000	46,000	3.161%	3.161%				46,000					
118	116	2023	Construction	-	6/30/2017	6/30/2027	42,000	42,000	4.750%	4.750%				42,000					
119	117	2023	Construction	-	7/31/2017	7/31/2027	42,000	42,000	4.750%	4.750%				42,000					
120	118	2023	Construction	-	3/31/2017	3/31/2032	50,000	5,100	4.870%	4.870%				5,100					

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2			A	B	C	D	E	F	G	H	I	J							
	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
121	119	2023	Environment	-	9/30/2017	9/30/2032	7,000	7,000	4.870%	4.870%				7,000					
122	120	2023	Construction	-	6/22/2011	6/30/2036	50,000	50,000	4.629%	4.629%				41,259		1,809			
123	121	2023	Construction	-	4/30/2011	4/30/2039	40,000	40,000	4.794%	4.794%				38,656		1,344			
124	122	2023	Construction	-	6/22/2011	6/30/2040	25,000	25,000	4.775%	4.775%				24,032		968			
125	123	FY 2023 Subtotal:		-	-	-	316,300	271,400	-					260,347		4,121			
126	124	2024	Construction	-	3/31/2012	3/31/2024	45,000	45,000	1.757%	1.757%				45,000					
127	125	2024	Construction	-	8/2/2011	8/31/2033	40,000	40,000	4.386%	4.386%				14,265		691			
128	126	2024	Construction	-	8/2/2011	8/31/2034	40,000	40,000	4.416%	4.416%				38,018		1,982			
129	127	2024	Construction	-	8/2/2011	8/31/2035	40,000	40,000	4.446%	4.446%				37,946		2,054			
130	128	2024	Construction	-	8/2/2011	8/31/2035	40,000	40,000	4.446%	4.446%				37,946		2,054			
131	129	2024	Construction	-	8/2/2011	8/31/2035	45,000	45,000	4.446%	4.446%				42,689		2,311			
132	130	2024	Construction	-	12/31/2013	12/31/2035	10,000	10,000	4.472%	4.472%				9,493		507			
133	131	2024	Construction	-	6/22/2011	6/30/2036	50,000	6,932	4.629%	4.629%				6,662		270			
134	132	2024	Construction	-	11/20/2013	6/30/2036	36,000	36,000	4.397%	4.397%				33,900		2,100			
135	133	FY 2024 Subtotal:		-	-	-	346,000	302,932	-					265,919		11,969			
136	134	2025	Construction	-	1/31/2015	1/31/2025	34,000	34,000	3.540%	3.540%				34,000					
137	135	2025	Environment	-	2/28/2010	2/28/2025	10,000	10,000	4.279%	4.279%				10,000					
138	136	2025	Construction	-	2/28/2015	2/28/2025	40,000	40,000	3.540%	3.540%				40,000					
139	137	2025	Construction	-	3/31/2015	3/31/2025	56,000	56,000	3.540%	3.540%				56,000					
140	138	2025	Construction	-	4/30/2015	4/30/2025	52,000	52,000	3.540%	3.540%				52,000					
141	139	2025	Construction	-	8/2/2011	8/31/2032	98,900	98,900	4.355%	4.355%				36,200		1,393			
142	140	2025	Construction	-	8/2/2011	8/31/2033	40,000	25,044	4.386%	4.386%				24,026		1,018			
143	141	2025	Construction	-	11/30/2013	11/30/2035	15,000	15,000	4.365%	4.365%				14,203		797			
144	142	2025	Construction	-	1/31/2014	1/31/2043	15,000	15,000	4.380%	4.380%				13,779		1,221			
145	143	FY 2025 Subtotal:		-	-	-	360,900	345,944	-					280,207		4,430			
146	144	2026	Construction	-	10/31/2010	10/31/2025	45,000	45,000	3.494%	3.494%				45,000					
147	145	2026	Construction	-	10/31/2014	10/31/2025	43,000	43,000	3.600%	3.600%				43,000					
148	146	2026	Construction	-	12/31/2014	12/31/2025	50,000	50,000	3.600%	3.600%				50,000					
149	147	2026	Construction	-	5/30/2016	5/31/2031	58,000	58,000	4.320%	4.320%				57,462					
150	148	2026	Construction	-	8/2/2011	8/31/2032	98,900	61,308	4.355%	4.355%				59,375		1,932			
151	149	2026	Construction	-	11/20/2013	8/31/2034	6,000	6,000	4.324%	4.324%				5,733		267			
152	150	2026	Construction	-	11/20/2013	5/31/2035	20,000	20,000	4.354%	4.354%				19,087		913			
153	151	FY 2026 Subtotal:		-	-	-	320,900	283,308	-					279,656		3,113			
154	152	2027	Construction	-	10/31/2015	10/31/2026	42,000	42,000	4.130%	4.130%				42,000					
155	153	2027	Construction	-	11/30/2014	11/30/2026	25,000	25,000	3.660%	3.660%				25,000					
156	154	2027	Construction	-	11/30/2015	11/30/2026	25,000	25,000	4.130%	4.130%				25,000					
157	155	2027	Construction	-	12/31/2015	12/31/2026	49,000	49,000	4.130%	4.130%				49,000					
158	156	2027	Construction	-	5/3/2012	5/31/2027	17,000	17,000	1.757%	1.757%				17,000					
159	157	2027	Environment	-	5/3/2012	5/31/2027	13,000	13,000	1.757%	1.757%				13,000					
160	158	2027	Construction	-	5/31/2015	5/31/2027	59,000	59,000	3.660%	3.660%				59,000					
161	159	2027	Construction	-	6/30/2015	6/30/2027	47,000	47,000	3.660%	3.660%				47,000					
162	160	FY 2027 Subtotal:		-	-	-	277,000	277,000	-					277,000					
163	161	2028	Environment	-	11/20/2013	11/30/2027	5,000	5,000	3.967%	3.967%				5,000					
164	162	2028	Construction	-	8/31/1998	8/31/2028	106,500	106,500	5.850%	5.850%				106,500					
165	163	2028	Construction	-	8/31/1998	8/31/2028	112,300	112,300	5.850%	5.850%				112,300					
166	164	2028	Construction	-	5/30/2016	5/31/2031	58,000	538	4.320%	4.320%				538					
167	165	2028	Construction	-	6/30/2016	6/30/2031	45,000	45,000	4.320%	4.320%				45,000					
168	166	2028	Construction	-	7/31/2016	7/31/2031	46,000	46,000	4.320%	4.320%				1,345					
169	167	FY 2028 Subtotal:		-	-	-	372,800	315,338	-					270,684					
170	168	2029	Environment	-	10/31/2013	10/31/2028	6,000	6,000	3.880%	3.880%				6,000					
171	169	2029	Environment	-	1/31/2014	1/31/2029	3,000	3,000	3.896%	3.896%				3,000					
172	170	2029	Environment	-	7/31/2014	7/31/2029	3,000	3,000	1.757%	1.757%				3,000					
173	171	2029	Construction	-	7/31/2015	7/31/2029	47,000	47,000	3.780%	3.780%				47,000					
174	172	2029	Construction	-	8/2/2011	8/31/2029	50,000	50,000	4.238%	4.238%				50,000					
175	173	2029	Construction	-	8/31/2015	8/31/2029	65,000	65,000	3.780%	3.780%				65,000					
176	174	2029	Construction	-	9/30/2015	9/30/2029	69,000	69,000	3.780%	3.780%				69,000					
177	175	2029	Construction	-	7/31/2016	7/31/2031	46,000	44,655	4.320%	4.320%				28,389					
178	176	FY 2029 Subtotal:		-	-	-	289,000	287,655	-					271,389					
179	177	2030	Construction	-	11/20/2013	10/31/2029	55,000	55,000	4.093%	4.093%				55,000					

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
180	178	2030	Construction	-	1/31/2016	1/31/2030	33,000	33,000	4.270%	4.270%									33,000
181	179	2030	Construction	-	2/28/2016	2/28/2030	39,000	39,000	4.270%	4.270%									39,000
182	180	2030	Construction	-	3/31/2016	3/31/2030	55,000	55,000	4.270%	4.270%									55,000
183	181	2030	Construction	-	4/30/2016	4/30/2030	51,000	51,000	4.270%	4.270%									51,000
184	182	2030	Environment	-	9/30/2015	9/30/2030	6,000	6,000	3.840%	3.840%									6,000
185	183	2030	Construction	-	7/31/2016	7/31/2031	46,000	16,266	4.320%	4.320%									16,266
186	184	2030	Construction	-	8/31/2016	8/31/2031	63,000	63,000	4.320%	4.320%									18,302
187	185	FY 2030 Subtotal:		-	-	-	348,000	318,266	-										273,568
188	186	2031	Construction	-	11/20/2013	1/31/2031	30,000	30,000	4.162%	4.162%									30,000
189	187	2031	Construction	-	11/20/2013	2/28/2031	15,000	15,000	4.166%	4.166%									15,000
190	188	2031	Construction	-	11/20/2013	3/31/2031	18,000	18,000	4.171%	4.171%									18,000
191	189	2031	Construction	-	8/31/2016	8/31/2031	63,000	44,698	4.320%	4.320%									44,698
192	190	2031	Environment	-	9/30/2016	9/30/2031	7,000	7,000	4.320%	4.320%									7,000
193	191	2031	Construction	-	9/30/2016	9/30/2031	67,000	67,000	4.320%	4.320%									67,000
194	192	2031	Construction	-	11/20/2013	4/30/2034	28,000	28,000	4.311%	4.311%									27,756
195	193	2031	Construction	-	10/31/2013	10/31/2035	64,000	64,000	4.222%	4.222%									58,132
196	194	FY 2031 Subtotal:		-	-	-	292,000	273,698	-										267,586
197	195	2032	Construction	-	10/31/2009	10/31/2018	23,000	23,000	3.719%	5.223%	Auto	10/31/2018	10/31/2045	5.223%					23,000
198	196	2032	Construction	-	11/30/2009	11/30/2018	15,000	15,000	3.533%	5.223%	Auto	11/30/2018	11/30/2045	5.223%					14,618
199	197	2032	Construction	-	12/31/2009	12/31/2018	13,000	13,000	4.069%	5.223%	Auto	12/31/2018	12/31/2045	5.223%					13,000
200	198	2032	Construction	-	1/31/2010	1/31/2019	30,000	30,000	3.714%	5.223%	Auto	1/31/2019	1/31/2045	5.223%					30,000
201	199	2032	Construction	-	7/31/2009	7/31/2019	46,940	46,940	4.026%	5.179%	Global	7/31/2019	7/31/2041	5.179%					46,940
202	200	2032	Construction	-	9/30/2009	9/30/2019	35,000	35,000	3.699%	5.212%	Auto	9/30/2019	9/30/2044	5.212%					35,000
203	201	2032	Construction	-	7/31/2014	4/30/2032	9,000	9,000	1.757%	1.757%									9,000
204	202	2032	Construction	-	9/30/2013	9/30/2034	9,000	9,000	4.214%	4.214%									8,942
205	203	2032	Construction	-	8/31/2014	8/31/2035	18,740	18,740	3.635%	3.635%									18,740
206	204	2032	Construction	-	9/30/2014	9/30/2035	65,000	65,000	3.599%	3.599%									65,000
207	205	2032	Construction	-	10/31/2013	10/31/2035	64,000	4,276	4.222%	4.222%									4,203
208	206	FY 2032 Subtotal:		-	-	-	328,680	268,956	-										268,443
209	207	2033	Construction	-	11/30/2009	11/30/2018	15,000	382	3.533%	5.223%	Auto	11/30/2018	11/30/2045	5.223%					382
210	208	2033	Construction	-	6/30/2014	11/30/2032	21,000	21,000	1.757%	1.757%									21,000
211	209	2033	Construction	-	4/30/2014	2/28/2034	45,000	45,000	1.757%	1.757%									43,961
212	210	2033	Construction	-	4/30/2014	3/31/2034	45,000	45,000	1.757%	1.757%									43,963
213	211	2033	Construction	-	8/31/2014	8/31/2035	42,150	42,150	1.757%	1.757%									42,150
214	212	2033	Construction	-	10/31/2013	10/31/2035	64,000		4.222%	4.222%									
215	213	2033	Construction	-	5/31/2014	5/31/2036	29,000	29,000	1.757%	1.757%									18,490
216	214	FY 2033 Subtotal:		-	-	-	261,150	182,532	-										169,945
217	215	2034	Construction	-	5/31/2014	5/31/2036	29,000	9,036	1.757%	1.757%									8,591
218	216	2034	Construction	-	4/30/2014	10/31/2039	45,000	45,000	1.757%	1.757%									445
219	217	2034	Construction	-	1/27/2012	1/31/2040	30,000	30,000	1.757%	1.757%									39,061
220	218	2034	Replacements	-	3/31/2018	3/31/2053	195,278	195,278	5.250%	5.250%									5,939
221	219	FY 2034 Subtotal:		-	-	-	299,278	279,314	-										25,770
222	220	2035	Construction	-	4/30/2014	10/31/2039	45,000		1.757%	1.757%									25,770
223	221	2035	Construction	-	1/27/2012	1/31/2040	30,000		1.757%	1.757%									4,230
224	222	2035	Replacements	-	3/31/2018	3/31/2053	195,278	42,283	5.250%	5.250%									42,283
225	223	2035	Replacements	-	3/31/2019	3/31/2054	202,689	202,689	5.250%	5.250%									202,689
226	224	2035	Replacements	-	3/31/2020	3/31/2055	210,104	210,104	5.250%	5.250%									9,952
227	225	FY 2035 Subtotal:		-	-	-	683,071	455,076	-										254,923
228	226	2036	Replacements	-	3/31/2020	3/31/2055	210,104	200,152	5.250%	5.250%									200,152
229	227	2036	Replacements	-	3/31/2021	3/31/2056	215,186	215,186	5.250%	5.250%									53,078
230	228	FY 2036 Subtotal:		-	-	-	425,290	415,338	-										253,231
231	229	2037	Replacements	-	3/31/2021	3/31/2056	215,186	162,108	5.250%	5.250%									94,924
232	230	FY 2037 Subtotal:		-	-	-	215,186	162,108	-										94,924
233	231	2038	Replacements	-	3/31/2021	3/31/2056	215,186	67,184	5.250%	5.250%									57,344
234	232	FY 2038 Subtotal:		-	-	-	215,186	67,184	-										57,344
235	233	2039	Replacements	-	3/31/2021	3/31/2056	215,186	9,840	5.250%	5.250%									9,840
236	234	2039	Replacements	-	3/31/2022	3/31/2057	222,367	222,367	5.250%	5.250%									76,723
237	235	FY 2039 Subtotal:		-	-	-	437,553	232,207	-										86,563
238	236	2040	Replacements	-	3/31/2022	3/31/2057	222,367	145,644	5.250%	5.250%									104,411

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2			A	B	C	D	E	F	G	H	I	J							
	Fiscal Year	Project	Debt Type	In Service	Bond Due Date	Initial Principal	Current Principal	Original Rate	Effective Rate	Refinance Type	Refinanced Date	Rolled Maturity Date	Roll Rate	Principal Paid	Premium	Discount	Accrual	Reversal	
239	237		FY 2040 Subtotal:	-	-	222,367	145,644	-						104,411					
240	238	2041	Replacements	-	3/31/2022	3/31/2057	222,367	41,232	5.250%	5.250%				41,232					
241	239	2041	Replacements	-	3/31/2023	3/31/2058	228,727	228,727	5.250%	5.250%				16,094					
242	240		FY 2041 Subtotal:	-	-	451,094	269,959	-						57,327					
243	241	2042	Replacements	-	3/31/2023	3/31/2058	228,727	212,633	5.250%	5.250%				91,062					
244	242		FY 2042 Subtotal:	-	-	228,727	212,633	-						91,062					
245	243	2043	Replacements	-	3/31/2023	3/31/2058	228,727	121,570	5.250%	5.250%				31,065					
246	244		FY 2043 Subtotal:	-	-	228,727	121,570	-						31,065					
247	245	2044	Replacements	-	3/31/2023	3/31/2058	228,727	90,505	5.250%	5.250%				90,505					
248	246	2044	Replacements	-	3/31/2024	3/31/2059	235,874	235,874	5.250%	5.250%				64,874					
249	247		FY 2044 Subtotal:	-	-	464,601	326,380	-						155,379					
250	248	2045	Replacements	-	3/31/2024	3/31/2059	235,874	171,001	5.250%	5.250%				171,001					
251	249	2045	Replacements	-	3/31/2025	3/31/2060	241,196	241,196	5.250%	5.250%				55,312					
252	250		FY 2045 Subtotal:	-	-	477,070	412,197	-						226,313					
253	251	2046	Replacements	-	3/31/2025	3/31/2060	241,196	185,884	5.250%	5.250%				185,884					
254	252	2046	Replacements	-	3/31/2026	3/31/2061	245,991	245,991	5.250%	5.250%				34,633					
255	253		FY 2046 Subtotal:	-	-	487,187	431,875	-						220,516					
256	254	2047	Replacements	-	3/31/2026	3/31/2061	245,991	211,358	5.250%	5.250%				211,358					
257	255	2047	Replacements	-	3/31/2027	3/31/2062	250,787	250,787	5.250%	5.250%				2,796					
258	256		FY 2047 Subtotal:	-	-	496,778	462,145	-						214,154					
259	257	2048	Replacements	-	3/31/2027	3/31/2062	250,787	247,991	5.250%	5.250%				207,279					
260	258		FY 2048 Subtotal:	-	-	250,787	247,991	-						207,279					
261	259	2049	Replacements	-	3/31/2027	3/31/2062	250,787	40,712	5.250%	5.250%				40,712					
262	260	2049	Replacements	-	3/31/2028	3/31/2063	255,968	255,968	5.250%	5.250%				159,097					
263	261		FY 2049 Subtotal:	-	-	506,755	296,680	-						199,809					
264	262	2050	Replacements	-	3/31/2028	3/31/2063	255,968	96,871	5.250%	5.250%				96,871					
265	263	2050	Replacements	-	3/31/2029	3/31/2064	259,963	259,963	5.250%	5.250%				94,775					
266	264		FY 2050 Subtotal:	-	-	515,931	356,834	-						191,646					
267	265	2051	Replacements	-	3/31/2029	3/31/2064	259,963	165,188	5.250%	5.250%				165,188					
268	266	2051	Replacements	-	3/31/2030	3/31/2065	264,141	264,141	5.250%	5.250%				17,572					
269	267		FY 2051 Subtotal:	-	-	524,104	429,329	-						182,760					
270	268	2052	Replacements	-	3/31/2030	3/31/2065	264,141	246,568	5.250%	5.250%				173,230					
271	269		FY 2052 Subtotal:	-	-	264,141	246,568	-						173,230					
272	270		Grand Total			\$12,849,876	\$10,490,814	-						\$7,546,418	\$182	\$42,003			

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13. REPAYMENT THEORY OF OPERATION

13.1 Introduction

BPA is required to collect revenues sufficient to meet BPA's annual transmission expenses and cover the long-term obligations of the Federal Columbia River Transmission System.

The repayment program is used to determine whether a given set of annual revenues is sufficient to meet a given set of annual expenses and cover a given set of long-term obligations when applied in accordance with the requirements of Department of Energy Order RA 6120.2. The program is also used to determine the minimum factor by which future revenues can be multiplied to obtain a new set of revenues that will be sufficient to recover amortization costs.

The revenues and the expenses of the cost evaluation year will be assigned to all future years, in effect assigning the net operating revenue of the cost evaluation year to all future years and levelizing the long-term obligations over all future years.

13.2 Repayment Program Logic

The diagrams on the following pages show the flow of logic in BPA's repayment program. The first diagram shows the logic of the binary search used to locate minimum sufficient revenues. A necessary part of this search is the test for sufficiency. The logic of the test for sufficiency is shown on the remaining two diagrams.

The equations referred to are:

Revenue Equation: Net revenues of each year are expended on interest and payments on the principals.

Investment equation: The payments on each investment are less than or equal to the principal of that investment (and equal to the principal of that investment after the investment is due).

Predictor equation: For each future year, the accumulated revenues less the accumulated interest less the accumulated investments due is equal to the accumulated payments on high interest rate investments which are not due.

13.3 Bond Rollover Feature

Since the 2004 transmission rate case, BPA has incorporated a data manipulation feature associated with the repayment program. This feature does not change any methodology of the model but allows the user to assume that any short-term bonds associated with assets with average service lives longer than the bond maturity date are refinanced on the original maturity date, and recognizes replacement bonds with new maturity dates and corresponding interest rates. This feature reflects BPA's practice of rolling over a bond when it comes due if funds are not available to pay it at that time or if market conditions justify refinancing such bonds within the allowable repayment period of the associated assets. Reflecting this practice in the model allows a more realistic calculation of interest expense.

FIGURES

Figure 13-1 Repayment Program (Test for Sufficiency)

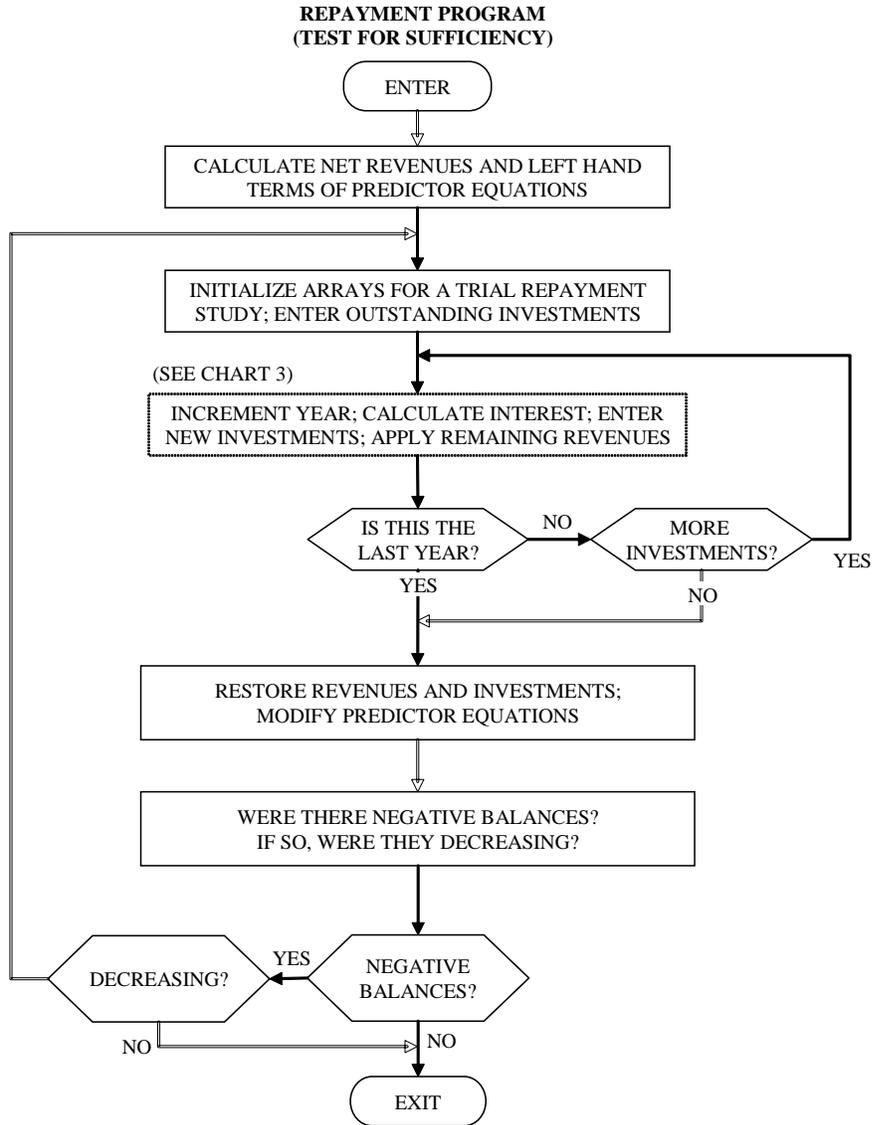


Figure 13-2 Repayment Program (Application of Revenues)

