Energy Northwest
Columbia Generating Station

FY 2013
Fuel Management Plan

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Section

1

Introduction

The Project Agreement between Energy Northwest and Bonneville Power Administration (BPA) for Columbia Generating Station requires Energy Northwest to submit with each annual budget a Ten-Year Fuel Management Plan.

This Fuel Management Plan for fiscal year (FY) 2013 covers the period from July 1, 2012, through June 30, 2022. This plan includes a cash flow analysis for expenditures and credits for each major component of the fuel cycle by month for the first five (5) years. Also, the contracts for each component of the fuel cycle are discussed. The tables and figures are located at the end of the text.

Section
2

Assumptions

Economic

Table 1 gives the predicted market prices for uranium concentrates (U_3O_8) and conversion and enrichment services. Forward market price data was taken from the *2011 Nuclear Fuel Cycle Supply and Price Report*, provided by Energy Resources International. Over the past year, the spot price for uranium has cycled between lows of $49.25 per lb. U_3O_8 to highs of $72.25 per lb. according to TradeTech, www.uranium.info, historical uranium prices. Spot price is a reflection of very near term inventory supply and demand dynamics. The accident at the Fukushima Daiichi reactors in Japan in March 2011 has caused significant changes in the spot market. Current spot demand is limited as utilities had previously moved to lock up additional forward years' requirements shortly after the price spike in 2007. Over the past year the term price has decreased from $70 per lb. U_3O_8 to $61 per lb. Term price is more closely tied to cost of production and does not exhibit the volatility seen with the spot price but does tend to follow the overall trend of the spot price. In any event, forward price projections predict the price to increase steadily as new mines begin production. The price projections for enrichment services remain near historical highs as new enrichment plants are being built. Prices are predicted to begin to decline once the plants are at full capacity. Near term enrichment prices have begun to decline due to surplus capacity being available due to delayed deliveries as a result of the extended reactor shutdowns in Japan and Germany following the accident at Fukushima Daiichi.

Energy Northwest's significant uranium inventory, mid-term uranium contracts and the long-term enrichment contract continue to minimize the near term impact of the rapid rise in fuel prices. The prices from the uranium and enrichment contracts are factored into the cash flow requirements but are not reflected in the prices in Table 1.

Fuel Cycle

Table 2 shows the assumptions for the fuel cycles used in this plan. Minor changes may occur in the process of design finalization. The planned energy requirements are consistent with the energy requirements supplied by BPA in accordance with the Project Agreement.

SECTION 2 ASSUMPTIONS

Both Final Feedwater Temperature Reduction (FFTR) and Thermal Power Level Coast-Down are planned for cost optimization during the final five to seven weeks of the operating run. During FFTR, the operation of the plant is extended at 100% thermal power level for 8-10 days while the electrical power level gradually decreases by about 1%. During coast-down, the power level is expected to decrease at a rate of 0.5% per day. The Fuel Management Plan assumes 9 days of FFTR and 21 days of coast-down for a total of 30 days of cycle extension for Cycle 22. Future cycles assume a total of 30 days of cycle extension. The planned cycle energy is within the acceptable range provided by BPA for energy requirements for fuel loading in Cycle 22.

The generation factor refers to the amount of energy that is expected to be generated relative to the maximum potential generation from when the generator is synchronized to the grid to when the reactor is shut down for the outage.

The generation factor and outage length are the critical parameters that determine the cycle energy from which the fuel requirements and ultimately the fuel budget is derived.

Section
3

Nuclear Fuel Market

Uranium Market

The uranium market has experienced dramatic fluctuations in price over the past eight years. In January 2003, the price of uranium was $10.20 per lb U_3O_8. The market price peaked in June 2007 at $135 per lb U_3O_8. The spot price was at a near term high of $72.25 in February 2011 and currently stands at $52.00 per lb U_3O_8 at the end of December 2011. At the time of the dramatic price increase, utilities moved to place their uncommitted requirements for the next three to six years under contract in an attempt to mitigate supply disruptions and limit their vulnerability to further price increases. As a result, spot supply and demand is very limited leading to market volatility where a 10% change in price from month to month is not uncommon.

A number of investment funds have also entered the market buying uranium, which places additional demand on already short supplies. Although this demand has contributed to the price rise, it also provides a source of liquidity to the market since the investors are solely looking for a return-on-investment. The economic credit crisis in 2008 resulted in the majority of funds starting to liquidate their inventory to raise cash leading to a softening of price. The funds have not been quick to return to the market as the price continues to decline and the accident at Fukushima Daiichi raises additional concerns in their minds about nuclear in general.

The Department of Energy (DOE) has finalized agreements to barter uranium to pay for the cleanup costs at the Portsmouth site for the next four years. DOE issued an Excess Uranium Inventory Management Plan on December 16, 2008 calling for planned annual sales of between 1.5 and 10.3 million pounds U_3O_8 equivalent through the 2017 timeframe. The barter amounts are within this plan.

Price projections indicate a close relationship between the projections and the current term price and show a steady increase in price over the next ten (10) years. The following table lists known factors affecting price:

Push Price Up	Push Price Down
New demand from India	Possible short term over-production
Increased worldwide demand for reactors: • China • Russia • Middle East • United States	Government policies • DOE Excess Uranium Sales
Production problems at mines • Cigar Lake mine flooding • Olympic Dam mine shaft damage	Investor selling • Unknown factor at this time
Low cost uranium mined first • McArthur River • Kazakhstan in situ leach mines	Decreased demand due to reactor shutdowns: • Japan • Germany
Development of uranium mines delayed • Olympic Dam expansion	Delay in new plant construction • United States • Asia
Overall decrease in availability of secondary supplies • US-Russia HEU deal ends in 2013 • Currently secondary supplies provide for 35% of world-wide requirements	
Interest/exchange rates • US dollar is weak against the major producer currencies	

Conversion Services

Spot conversion prices are currently at $7.50 per KgU relative to the term price of $16.75 per KgU as reported by TradeTech. Similar to U_3O_8, the price projections for conversion services indicate a close relationship between the projections and the current term price. Long-term prices are predicted to remain relatively stable into the foreseeable future. However, DOE sales activity will continue to suppress spot conversion prices as DOE sales are in the form of UF_6.

The current term price levels do allow for new expansion needed to upgrade or replace aging plants. Cameco has signed a toll-conversion agreement with British Nuclear Fuels plc (BNFL) to acquire uranium conversion services from BNFL's Springfield plant in Lancashire, UK. Comhurex is building another conversion facility to replace its existing plant in France. In addition, ConverDyn has started discussions with a European enrichment company to jointly build a new conversion plant in the UK.

Enrichment Market

The enrichment market has also seen price increases over the past few years. The spot price in January 2006 was $116 per Separative Work Unit (SWU) and has risen to a high of $165 per SWU in January 2010 with current market price reported by TradeTech at $140 per SWU. Near term enrichment prices have begun to decline due to surplus capacity being available due to delayed deliveries as a result of the extended reactor shutdowns in Japan and Germany following the accident at Fukushima Daiichi. The higher the tails assay, the more uranium feed is required and the less enrichment services. The lower the tails assay, the more enrichment services are required and less uranium feed. At the current prices for uranium and enrichment services, the optimum tails assay has reduced to 0.25% from historical levels of 0.30%. The result is an increase in enrichment demand and reduction in uranium demand. The price increase is also being driven by limited supply to meet the higher demand in the face of rising supply costs. Both the US and European gaseous diffusion plants (GDP) have experienced production cost increases due to an increase in power prices. Electricity costs account for nearly 60% of the enrichment costs at GDP enrichment plants.

Another factor fueling price increases in the near term is the fact that all three Western suppliers are in the process of either replacing their costly gaseous diffusion with centrifuge technology or expanding their existing capacity. Urenco has commenced operations at its new enrichment facility in New Mexico using its proven centrifuge technology. In addition, Urenco has increased the capacity at each of their European plants. AREVA has also commenced operations at their new gaseous centrifuge plant to replace their GDP facility at Tricastin in France. AREVA has also announced plans to build a domestic centrifuge plant in Idaho and has received a $2 billion loan guarantee from the DOE. General Electric has submitted a construction and operating license application for their laser enrichment facility in North Carolina, but has not made the decision to build a plant. Although the United States Enrichment Corporation (USEC) is also planning to replace their GDP facility in Kentucky with a gaseous centrifuge plant, USEC was denied a DOE loan guarantee for its American Centrifuge Plant in Ohio until the technology could be further proven.

USEC has drastically cut expenditures on its new plant while it tries to satisfy the DOE requirements.

Russian access to the US market continues to be restricted due to the Megatons-to-Megawatts program, which is set to expire in 2013. This program down-blended highly enriched uranium from weapons to low enrichments needed for use in nuclear power plants. However, the current Russian suspension agreement has been re-negotiated to allow increasing amounts of material to be supplied into the US market beginning in 2014. The impact of this new supply should help stabilize or lower prices in the long term.

Fuel Fabrication

Currently, three fabricators supply fabricated fuel to the US BWR community: Global Nuclear Fuel (GNF), AREVA and Westinghouse. There have been no major supply disruptions in the fabrication sector, which looks well poised to support any domestic nuclear renaissance. AREVA announced consolidation of its PWR and BWR fabrication facilities and has moved its PWR fuel fabrication from Virginia to Richland, WA.

Section
4

Fuel Management Strategy

Fuel Cycle Designs

During FY2012, Columbia will be in the first half of Cycle 21. This is the second reload of the GE14 fuel design. The current bundle and core design contain a batch size of 244 assemblies with an average enrichment of ~4.08 wt% U^{235}. The Cycle 21 core has energy available to be able to operate at 100% power for 621 days plus an additional 30 days of cycle extension (9 days of FFTR and 21 days of coast-down).

Fuel Procurement Strategy

Energy Northwest has established a fuel procurement strategy to 1) achieve the long-term goal of a secure and consistently low cost fuel supply, and 2) be flexible enough to take advantage of cost saving opportunities as they arise. Energy Northwest signed a number of agreements from 2003-2006 culminating in the Uranium Tails Pilot Proejct. Energy Northwest has been essentially drawing down this inventory since that time. This has allowed Energy Northwest to forego contracting during the price spike in 2007. In addition, Energy Northwest contracted for enrichment services in the beginning of 2006 for supply in 2010-2015 thereby "beating" the price jump in enrichment services. Energy Northwest signed two uranium supply contracts in 2009 for delivery over FY2011-FY2014 for a total of 1,540,000 pounds of U_3O_8, with the rights to purchase additional optional quantities.

Typically Energy Northwest strives to maintain a strategic inventory of one reload's worth of enriched uranium and approximately half a reload of natural uranium. Energy Northwest made a purchase of enriched uranium during Fiscal Year 2011 for strategic inventory due to reduced market prices. Energy Northwest will continue to make uranium and conversion purchases to maintain strategic inventory levels of natural uranium.

Fuel Procurement Activities

In FY 2012, Energy Northwest issued a Request for Proposal (RFP) for the supply of conversion services for Fiscal Years 2012-2014 with the intent to buy when prices are lower than the forecasted term prices and avoid storage fees on U_3O_8. The total quantity of conversion requested under the RFP equates to slightly more than one reload.

Fabrication Services

A fabrication services contract for Columbia Generating Station for the fuel supply for three reloads was awarded to GNF in June 2007. The 2011 refueling outage will be the second reload of GNF's GE14 fuel design. There is the option to begin loading the advanced GNF2 design in subsequent cycles. A detailed evaluation will be done to determine the merits of loading the GNF2 design prior to making a recommendation to management.

Energy Northwest is pursuing the licensing and implementation of the operating flexibility program for APRM, RBM Technical Specifications (ARTS) Improvement and Maximum Extended Load Line Limit Analysis (MELLLA) and supply of the Power Range Neutron Monitoring (PRNM) Nuclear Measurement Analysis and Control (NUMAC) system with Option III Stability for the Columbia Generation Station. This project is referred to as "ARTS/MELLLA and PRNM". The project has an approved budget of $23.3 million for Fiscal Years 2009-2015, excluding financing costs. The benefits to the station are reduced fuel cost due to reduced batch size and improved fuel utilization, increased operating flexibility, increased net generation due to reduced recirculation pump speed, reduction in the number of downpowers to reposition control rods, reduction of nuisance alarms in the control room, and improved equipment reliability by replacing obsolete and aging equipment. The project was originally planned to be installed in 2011 refueling outage but has been delayed due to PRNM licensing issues and is now planned to be installed in the 2015 Refueling Outage. As a result, Energy Northwest has begun discussions with GNF to extend the existing fabrication services contract one additional cycle to 2015. The project is a Fuel Capital project and is financed using bond proceeds.

Other Fabrication Costs

A number of costs in addition to vendor fabrication costs for the fuel bundles and analytical services are included as fabrication costs. These costs address the following types of activities:

- Fuel receipt & inspection
- Fuel procurement
- Fuels' staff
- Fuel consultants
- Fuels' work-station and code fees
- Fuels' travel and training

Fuel Management Physical Requirements

The assumed cycle energies and fuel designs are used to develop multi-cycle reload material requirement projections. The projected reload material requirements are integrated with the existing inventory levels to project procurement requirements into the future. Tables 3 and 4 summarize those requirements over the next ten years.

Table 3 assumes uranium is purchased as uranium concentrates (U_3O_8). Conversion services must then be purchased to convert the concentrates to uranium hexafluoride (UF_6). Enrichment services are then purchased to convert the natural UF_6 to enriched UF_6. The enriched UF_6 is transferred to the fabrication facility and used to fabricate the necessary quantity of fuel assemblies. Table 4 shows the total material of each form existing as of the end of each fiscal year. Typically, the processing time from concentrates to fabricated fuel assemblies is one year, allowing for the necessary material lead times at each step in the process. Therefore, the majority of the material in Table 4 is considered to be working stock with a lesser portion considered the strategic inventory.

Spent Fuel Storage and Disposal

DOE Spent Fuel Contract

While the courts have now ruled that DOE had a binding obligation to begin acceptance of spent nuclear fuel no later than January 31, 1998, DOE has suspended all work on the license application for the Yucca Mountain underground storage repository. Energy Northwest began legal action due to DOE's failure to meet its obligations for spent fuel and on August 29, 2011, Energy Northwest received $48,702,551 from DOE for expenditures made on the Independent Spent Fuel Storage Installation (ISFSI) prior to September 1, 2006. Energy Northwest will continue further legal action to recover expenditures made on ISFSI starting September 1, 2006. Energy Northwest continues to pay a waste disposal fee as indicated in the category of Disposal.

On-Site Spent Fuel Storage

Columbia Generating Station operates an Independent Spent Fuel Storage Installation (ISFSI) using NRC-approved dry storage casks to supplement wet storage in the fuel pool. The ISFSI, located just north of the Deschutes Building, is capable of being expanded to hold the lifetime spent fuel requirements of Columbia Generating Station. Twenty-seven

(27) storage casks have been loaded to date, moving 1,836 assemblies from the fuel pool to the ISFSI.

The costs for the inner storage canister (called a multi-purpose canister or MPC) and closure welds are treated as fuel and are included in this Fuel Management Plan in the category of Casks. The costs of the overpacks, facility, and common equipment are treated as a plant capital addition. The Fiscal Years 2014-2019 cost of a multi-purpose canister is currently estimated to be $928,911 and welding costs are estimated to be $90,807 per MPC. This equates to a per bundle cost of $14,996. The Fiscal Year 2020 and beyond cost of a multi-purpose canister is currently estimated to be $1,640,504 and welding costs are estimated to be $119,590 per MPC. This equates to a per bundle cost of $25,884. Future costs have been escalated.

Active Contracts

Appendix A contains descriptions of the currently active fuel management contracts for nuclear material and fabrication services.

Section
5

Nuclear Fuel Budgets

Nuclear Fuel Costs

A measure of nuclear fuel cost is the Fuel-in-Process costs, or the costs to fabricate finished fuel assemblies. The estimated costs for the reload batch for Cycle 22 are shown in Table 5. Reload batch costs are amortized over the life of the fuel. Typically, fuel resides in the reactor core for three (3) cycles (equivalent to six years).

Fuel Revenue

There is currently no projected cash revenue from Fuels activities in FY2013-FY2022. However, Energy Northwest received a payment of 67,500 KgU of conversion services in December 2011 from the loan of 450,000 KgU of conversion services to ConverDyn. The current spot market value of 67,500 KgU of conversion services would be approximately $506,250.

Nuclear Fuel Cash Flows

The summary of cash requirements for the ARTS/MELLLA and PRNM project for FY 2013 are provided in Table 7. A summary of cash flows by fuel component and fiscal year for the next ten years is given in Table 8. Cash flows for nuclear fuel by month for each component for the next five years are shown in Tables 9 through 13. The cash flows are in today's dollars including the costs associated with the nuclear material (uranium, conversion, enrichment).

Section
6

Tables and Figures

Table 1

Projected Market Fuel Prices

Year	Uranium $/lb U3O8	Conversion $/kgU UF6	Enrichment $/SWU
2013	$50.00	$13.25	$149.00
2014	$51.00	$13.75	$149.00
2015	$52.00	$14.00	$147.00
2016	$53.00	$14.25	$140.00
2017	$54.00	$14.50	$134.00
2018	$55.00	$15.25	$133.00
2019	$56.00	$15.50	$133.00
2020	$57.00	$15.75	$133.00
2021	$58.50	$16.00	$133.00
2022	$60.00	$16.25	$135.00

Table 2

Fuel Cycle Assumptions

Fiscal Year	Outage Length (Days)	Cycle	Energy FPD	Generation Factor %
2013	40	22	651	94%
2014				
2015	40	23	641	94%
2016				
2017	40	24	645	94%
2018				
2019	40	25	650	94%
2020				
2021	40	26	650	94%
2022				

Energy FPD = Operating Calendar Days x GF – (Days lost during startup and coastdown)

Table 3

Planned Purchases of Nuclear Material and Fuel Fabrication Requirements

Purchases				Fabrication		
Fiscal Year	Lbs U_3O_8	KgU UF_6 Conversion	SWU	KgU Enriched UF_6	SWU	# Bundles
2013	407,605	156,000	0	408,419	247,556	248
2014	428,507	164,000	137,500			
2015	154,158	59,000	143,000	422,026	255,803	256
2016	300,000	114,817	247,500			
2017	100,000	38,272	132,000	422,026	255,803	256
2018	460,000	176,053	206,800			
2019	460,000	176,053	0	422,026	255,803	256
2020	500,000	191,362	250,000			
2021	500,000	191,362	0	422,026	255,803	256
2022	525,000	200,930	250,000			

Table 4

Nuclear Material Totals

Fiscal Year	Natural UF_6 KgU	Enriched Uranium Product	
		UF_6	SWU
2013	891,189	343,155	215,120
2014	875,883	542,141	340,010
2015	748,405	327,061	214,092
2016	540,472	685,236	438,893
2017	406,611	454,237	302,984
2018	312,988	753,513	490,818
2019	489,041	331,487	235,014
2020	253,848	758,041	485,014
2021	445,210	336,015	229,211
2022	219,586	762,569	479,211

Table 5

Predicted Reload Batch Costs
($1000)

Component	CGS1-21
# of Assemblies	248
Fuel Cost:	
Uranium	$31,095
Conversion	$2,045
Enrichment	$25,943
Fabrication	$27,641
Sales Tax	$6,556
Fuels' Projects	$0
TOTAL	$93,280
Cask Cost:	
TOTAL	$3,719
TOTAL COST:	**$96,999**

Per Assembly Cost
($)

Fuel Cost	$376,131
Cask Cost	$14,996
Total Cost	$391,127

Table 6

Estimated Revenue From Fuel ($1000)

Fiscal Year	Revenue
2013	0
2014	0
2015	0
2016	0
2017	0
2018	0
2019	0
2020	0
2021	0
2022	0

Table 7

FY2013 Fuel Project Cash Flow [1] (ARTS/MELLLA+PRNM)

Month	Cash Flow
Jul-12	$38,500
Aug-12	$50,800
Sep-12	$50,700
Oct-12	$50,700
Nov-12	$50,550
Dec-12	$38,050
Jan-13	$38,050
Feb-13	$29,550
Mar-13	$37,000
Apr-13	$173,700
May-13	$8,700
Jun-13	$8,700
Total	$575,000

[1] The costs of the project will be funded by the issuance of bonds.

Table 8

10-Year Cash Flow for Nuclear Fuel ($1,000)

FY	Uranium	Conversion	Enrichment	Staff	Fabrication	Tax	Casks	Fuel Cash[1]	Disposal	Gen Tax
2013	$25,985	$1,393	$0	$1,841	$22,326	$6,556	$2,455	$60,556	$8,879	$4,626
2014	$27,317	$1,465	$17,867	$1,763	$1,535	$0	$3,121	$53,068	$7,880	$4,409
2015	$9,828	$527	$18,910	$1,953	$25,297	$7,825	$371	$64,711	$9,006	$5,269
2016	$15,900	$1,636	$33,309	$1,871	$1,624	$0	$9,034	$63,374	$7,984	$5,050
2017	$5,400	$555	$17,539	$2,072	$27,641	$8,399	$5,948	$67,554	$8,883	$6,106
2018	$25,300	$2,685	$27,831	$1,985	$1,718	$0	$8,008	$67,527	$7,950	$5,804
2019	$25,760	$2,729	$0	$2,198	$29,418	$9,156	$0	$69,261	$8,881	$6,971
2020	$28,500	$3,014	$33,250	$2,105	$1,818	$0	$2,828	$71,515	$7,942	$6,629
2021	$29,250	$3,062	$0	$2,332	$31,315	$9,799	$2,474	$78,232	$8,846	$7,970
2022	$31,500	$3,314	$34,000	$2,198	$1,926	$0	$5,791	$78,729	$7,867	$7,548
Total	$224,740	$20,380	$182,706	$20,318	$144,618	$41,735	$40,030	$674,527	$84,118	$60,382

(1) The total fuel cash does NOT include the costs of the ARTS/MELLLA+PRNM project. The costs of the project will be funded by the issuance of bonds.

Table 9

Fiscal Year 2013 Monthly Cash Flow ($1000)

Date	Uranium	Conv.	Enrich	Staff	Fab	Tax	Casks	Fuel Cash[1]	Disposal	Gen Tax
Jul-12	25,985	1,393		153	242			27,773		
Aug-12				153	242			395	2,223	
Sep-12				153	242		620	1,015		
Oct-12				153	242		100	495		
Nov-12				153	242			395	2,243	
Dec-12				153	242			395		
Jan-13				153	242			395		
Feb-13				153	242			395	2,243	
Mar-13				153	242		1,735	2,130		
Apr-13				153	242			395		
May-13				153	19,909	6,556		26,619	2,170	
Jun-13				153				153		4,626
Total	25,985	1,393		1,841	22,326	6,556	2,455	60,556	8,879	4,626

(1) The total fuel cash does NOT include the costs of the ARTS/MELLLA+PRNM project. The costs of the project will be funded by the issuance of bonds.

Table 10

Fiscal Year 2014 Monthly Cash Flow ($1000)

Date	Uranium	Conv.	Enrich	Staff	Fab	Tax	Casks	Fuel Cash	Disposal	Gen Tax
Jul-13	27,317	1,465	17,867	147	128			46,923		
Aug-13				147	128			275	1,263	
Sep-13				147	128		1,239	1,514		
Oct-13				147	128		140	415		
Nov-13				147	128			275	2,230	
Dec-13				147	128		924	1,199		
Jan-14				147	128			275		
Feb-14				147	128			275	2,230	
Mar-14				147	128		272	547		
Apr-14				147	128		272	547		
May-14				147	128		272	547	2,157	
Jun-14				147	128			275		4,409
Total	27,317	1,465	17,867	1,763	1,535		3,121	53,067	7,880	4,409

Table 11

Fiscal Year 2015 Monthly Cash Flow ($1000)

Date	Uranium	Conv.	Enrich	Staff	Fab	Tax	Casks	Fuel Cash	Disposal	Gen Tax
Jul-14	9,828	527	18,910	163	256			29,684		
Aug-14				163	256			419	2,246	
Sep-14				163	256			419		
Oct-14				163	256			419		
Nov-14				163	256			419	2,278	
Dec-14				163	256			419		
Jan-15				163	256		371	791		
Feb-15				163	256			419	2,278	
Mar-15				163	256			419		
Apr-15				163	256			419		
May-15				163	22,734	7,825		30,722	2,204	
Jun-15				163				163		5,269
Total	9,828	527	18,910	1,953	25,297	7,825	371	64,711	9,006	5,269

Table 12

Fiscal Year 2016 Monthly Cash Flow ($1000)

Date	Uranium	Conv.	Enrich	Staff	Fab	Tax	Casks	Fuel Cash	Disposal	Gen Tax
Jul-15	15,900	1,636		156	135		1,114	18,942		
Aug-15				156	135			291	1,280	
Sep-15				156	135			291		
Oct-15				156	135		1,155	1,446		
Nov-15				156	135			291	2,251	
Dec-15				156	135			291		
Jan-16			33,309	156	135			33,600		
Feb-16				156	135			291	2,251	
Mar-16				156	135		1,800	2,091		
Apr-16				156	135		3,964	4,255		
May-16				156	135		500	791	2,202	
Jun-16				156	135		500	791		5,050
Total	15,900	1,636	33,309	1,871	1,624		9,034	63,373	7,984	5,050

Table 13

Fiscal Year 2017 Monthly Cash Flow ($1000)

Date	Uranium	Conv.	Enrich	Staff	Fab	Tax	Casks	Fuel Cash	Disposal	Gen Tax
Jul-16	5,400	555		173	272			6,399		
Aug-16				173	272			444	2,246	
Sep-16				173	272		929	1,373		
Oct-16				173	272		100	544		
Nov-16				173	272			444	2,237	
Dec-16				173	272		878	1,322		
Jan-17			17,539	173	272			17,983		
Feb-17				173	272			444	2,237	
Mar-17				173	272		4,042	4,486		
Apr-17				173	272			444		
May-17				173	24,924	8,399		33,495	2,163	
Jun-17				173				173		6,106
Total	5,400	555	17,539	2,072	27,641	8,399	5,948	67,554	8,883	6,106

APPENDIX A ACTIVE FUEL CONTRACTS

Appendix A
Active Nuclear Material Contracts

Contract	Vendor	Scope
324350	Global Nuclear Fuel	Energy Northwest contracted with GNF in June 2007 to supply fuel design, licensing, and fabrication services for three consecutive reloads for Columbia Generating Station. The first reload under this contract was delivered in the spring of 2009. The scope of this contract will meet the needs of Columbia Generating Station for reload fabrication services through 2013. This contract is currently under negotiation to extend the supply one additional reload (2015).
313337	Urenco	Energy Northwest contracted with Urenco in January 2003 to supply enrichment services for delivery over calendar years 2005 to 2009. The contract was amended (twice) to procure additional SWU. In January 2006, Energy Northwest issued RFP 640137 for SWU to be delivered between calendar years 2010 to 2015. Urenco was awarded the procurement and the contract extended through 2015. The contract has been amended two additional times to move deliveries to meet the needs of both Urenco and Energy Northwest extending the contract through 2017.
330249	Nufcor International Limited	In July 2009, Energy Northwest issued RFP 656708 for natural uranium to be delivered between calendar years 2011 to 2020 to be awarded to multiple suppliers. Nufcor was selected to supply uranium concentrates between calendar years 2012 to 2014. This contract is to be amended from the supply of uranium concentrates to uranium hexafluoride as part of the FY2012 conversion procurement.
313179	UG USA	Energy Northwest established a no-requirements contract with UG USA in 2003 to supply uranium, conversion and/or enrichment services. Each individual purchase under the contract will require approval of the Energy Northwest management, Executive Board and BPA, as required.
334070	UG USA	Energy Northwest established a contract with UG USA for the storage of uranium concentrates in 2011. The contract provides free storage until April 2012, with storage fees of $0.30 per pound per year thereafter. The maximum amount allowed in storage is 1 million pounds.