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October 23, 2015

VIA ELECTRONIC AND U.S. MAIL

PUC Filing Center
Public Utility Commission of Oregon
PO Box 1088
Salem, OR 97308-1088

Re: UE ___ – In the Matter of IDAHO POWER COMPANY's 2016 Annual Power Cost Update

Attention Filing Center:

Enclosed for filing in the above-referenced matter are an original and five copies of Idaho Power Company's Direct Testimony of Kelley K. Noe (Idaho Power/100-108). Please direct all communications in this matter to:

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A copy of this filing has been served on all parties to the 2015 APCU (UE 293). Please contact this office with any questions.

Very truly yours,

Wendy McIndoo
Office Manager

Enclosures
Cc: UE 293 Service List

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CERTIFICATE OF SERVICE

I hereby certify that I served a true and correct copy of the foregoing document in Docket UE ___ on the following named person(s) on the date indicated below by email addressed to said person(s) at his or her last-known address(es) indicated below.

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DATED: October 23, 2015



Wendy McIndoo
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BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

UE ____

IN THE MATTER OF IDAHO POWER)
COMPANY'S 2016 ANNUAL POWER)
COST UPDATE)
OCTOBER UPDATE)
_____)

IDAHO POWER COMPANY

DIRECT TESTIMONY

OF

KELLEY K. NOE

October 23, 2015

1 **Q. Please state your name, business address, and present occupation.**

2 A. My name is Kelley K. Noe. I am employed by Idaho Power Company (“Idaho Power”
3 or “Company”) as a Senior Regulatory Analyst in the Regulatory Affairs Department.
4 My business address is 1221 West Idaho Street, Boise, Idaho 83702.

5 **Q. Please describe your educational background.**

6 A. In May of 2004, I received a Bachelor of Business Administration in Finance from
7 Boise State University. I have also attended electric utility ratemaking courses,
8 including “The Basics: Practical Regulatory Training for the Electric Industry,” a
9 course offered through New Mexico State University’s Center for Public Utilities,
10 “Introduction to Rate Design and Cost of Service Concepts and Techniques”
11 presented by Electric Utilities Consultants, Inc., and Edison Electric Institute’s
12 “Electric Rates Advanced Course.”

13 **Q. Please describe your business experience with Idaho Power Company.**

14 A. In September 2006, I accepted a position at Idaho Power as a Financial Analyst in
15 the Finance Department. My responsibilities as a Financial Analyst were two-fold. In
16 the credit analysis portion of my position, I was responsible for gathering
17 counterparty credit and financial information, preparing a risk analysis, and approving
18 an appropriate credit limit assignment. When necessary, I negotiated security or
19 collateral documents in accordance with corporate credit standards. The other
20 responsibilities in my position included providing the financial support for the Grid
21 Operations, Planning, and Operations Analysis and Development groups. This
22 included preparing studies, reports, analyses, and recommendations in areas such
23 as budgets, forecasts, capital expenditure proposals, financial plans, and regulatory
24 requirements.

25 In October 2010, I accepted a Regulatory Analyst II position within the
26 Regulatory Affairs Department of the Company and in 2015 I was promoted to a

1 Senior Regulatory Analyst. My duties as a Senior Regulatory Analyst include
2 gathering, analyzing, and coordinating data from various departments throughout the
3 Company required for development of jurisdictional separation studies. In addition, I
4 provide analyst support for the Company's regulatory issues related to its pension
5 plan, emission control upgrades at the Jim Bridger power plant ("Bridger plant"), the
6 exchange of certain transmission assets with PacifiCorp, and the Environmental
7 Protection Agency's proposed rule to regulate carbon emissions from existing power
8 plants under Clean Air Act Section 111(d).

9 **Q. What is the purpose of your testimony in this proceeding?**

10 A. The purpose of my testimony is to present the determination of the Company's 2016
11 October Update, the first portion of the Company's Annual Power Cost Update
12 ("APCU"). If approved, the 2016 October Update will result in a revenue increase of
13 approximately \$0.41 million, or 0.79 percent, to become effective June 1, 2016.

14 **Q. How is your testimony organized?**

15 A. My testimony begins with a brief history of the APCU and the filing requirements
16 associated with it. Next, my testimony describes the required updates to the
17 AURORA model ("AURORA") and the modeling results of those changes. I then
18 present and discuss the total net power supply expenses ("NPSE") for the 2016
19 October Update and how they compare to last year's 2015 October Update. My
20 testimony concludes with the quantification of the projected revenue deficiency and
21 the proposed rate implementation to eliminate that deficiency.

22 **Q. Have you prepared exhibits for this proceeding?**

23 A. Yes. I am sponsoring the following exhibits:

- 24 1. Exhibit 101, AURORA modeling determination of normalized power supply
25 expenses for April 1, 2016 – March 31, 2017

26

- 1 2. Exhibits 102 – 104, Forward Price Curves, Producer Price Index, and
- 2 Forward Prices used for re-pricing purchased power and surplus sales
- 3 3. Exhibit 105, total normalized base power supply expenses for the 2016
- 4 October Update
- 5 4. Exhibit 106, Year-over-Year Differences in modeled NPSE
- 6 5. Exhibit 107, Revenue Spread
- 7 6. Exhibit 108, Calculation of Revenue Impact

8 APCU Overview

9 **Q. What is the APCU?**

10 A. The APCU is a rate mechanism that is comprised of two components, an October
11 Update and a March Forecast. The October Update establishes the prospective
12 “base” or “normal” power supply expenses based on an April through March test
13 period (“test period”). The March Forecast is a forecast of “expected” power supply
14 expenses over the same test period as the October Update. “Base” or “Normal”
15 power supply expenses are calculated by modeling the test period under multiple
16 water conditions, in this case the Company modeled 87 water conditions (1928-
17 2014). “Expected” power supply expenses are calculated by modeling the same test
18 period as the October Update except the power supply expenses are calculated by
19 modeling a single forecasted water condition from the Northwest River Forecast
20 Center. The results of the October Update are reflected as an update to base rates
21 and the results of the March Forecast are reflected in the rates listed in Schedule 55,
22 with both going into effect on June 1st of each year.

23 **Q. What is the definition of the term “net power supply expenses” as the**
24 **Company and the Commission have used the term historically?**

25 A. The Company and the Commission have used the term “net power supply expense”
26 to refer to the sum of the following Federal Energy Regulatory Commission (“FERC”)

1 accounts: fuel expense (FERC Accounts 501 and 547) and purchased power
2 expenses (FERC Account 555), excluding Public Utility Regulatory Policies Act of
3 1978 (“PURPA”) expenses minus surplus sales revenues (FERC Account 447). For
4 ratemaking purposes, PURPA expenses have been quantified separately from other
5 power supply expenses and are treated as fixed inputs to power supply modeling
6 rather than variable inputs.

7 **Q. What regulatory actions led to the implementation of the APCU?**

8 A. In its Order issued in Idaho Power’s rate case, UE 167, the Public Utility Commission
9 of Oregon (“Commission”) specifically recognized the Company’s unique reliance on
10 hydro generation and its extended amortization of deferred costs, and therefore
11 directed the parties to work together to “consider whether there is a more effective
12 regulatory mechanism for Idaho Power to recover its allowable power costs.” (Order
13 No, 05-871, p. 7). Following that Order, the Company filed its request for a power
14 cost adjustment mechanism (“PCAM”) and the result of that filing was a settlement
15 stipulation approved by the Commission in Order No. 08-238 that approved the
16 APCU, which consists of the October Update and the March Forecast, and the
17 implementation of the PCAM or the annual power supply expense true-up.

18 **Q. What is the purpose of the APCU?**

19 A. The APCU was implemented to adjust rates on an annual basis to capture variability
20 in power supply expenses that occur with a predominantly hydro-based generation
21 fleet. The APCU mechanism closely aligns the power supply expenses included in
22 customer rates with the power supply expenses actually incurred by the Company.
23 Prior to the APCU, the Company would defer excess power supply expenses and
24 then amortize them at a later time for collection, which led to multiple deferrals and
25 long amortization periods.

26 **Q. What are the requirements of Order No. 08-238?**

1 A. Order No. 08-238 directed the Company to model its power supply expenses using
2 the AURORA model, and it also identified a number of variables that were to be
3 updated annually in AURORA. The specific variables are discussed in the following
4 section.

5 **Q. What is the AURORA model?**

6 A. The AURORA model is a comprehensive electric resource dispatch model that
7 simulates the economic dispatch of the Company's resources to determine NPSE for
8 the APCU. The Commission has also accepted the use of AURORA to determine
9 NPSE for general rate cases, marginal costs analyses, and resource modeling for
10 the Company's Integrated Resource Plan ("IRP").

11 **AURORA Model Inputs and Modeling Results**

12 **Q. What are the specific variables that are to be updated during each APCU**
13 **filing?**

14 A. Commission Order No. 08-238 identified the following power supply expense
15 variables to be updated annually:

- 16 a. Fuel prices and transportation costs
 - 17 b. Wheeling expenses
 - 18 c. Planned outages and forced outage rates
 - 19 d. Heat rates
 - 20 e. Forecast of Normalized Load and Normalized Sales
 - 21 f. Contracts for wholesale power and power purchases and sales
 - 22 g. Forward price curve
 - 23 h. PURPA contract expenses
 - 24 i. The Oregon state allocation factor
- 25
26

1 For this year's October Update, the Company reviewed all of the inputs and updated
2 those inputs that have changed since last year's October Update, which are
3 described in more detail in the following section of my testimony.

4 Fuel Expense

5 **Q. Have any changes in the variable cost of coal production occurred since last**
6 **year's October Update filing?**

7 A. Yes. The per-unit variable cost of production for each of the Company's coal-fired
8 thermal generation plants have been updated to reflect current operating costs. The
9 per-unit cost of output at the Bridger plant has increased from \$26.25 per megawatt-
10 hour ("MWh") to \$28.79 per MWh. The per-unit cost of output at the Boardman plant
11 decreased, moving from \$27.57 per MWh to \$25.32 per MWh. The per-unit cost of
12 output at the Valmy plant has increased from \$35.45 per MWh to \$47.18 per MWh.

13 **Q. Have there been any operational changes at the coal plants that would explain**
14 **the change in the per-unit variable cost of production since last year's October**
15 **update?**

16 A. The per-unit variable cost of coal production can vary year-to-year simply due to
17 fluctuations in everyday operations. These normal variations can be attributed to
18 price variability provided for in existing contracts for coal supply and shipment and
19 variability in plant and coal yard operations. While there was no material change in
20 the plant operations at Valmy and Boardman since last year, the Bridger plant is
21 experiencing some of the same issues that were encountered last year. As was the
22 case last year, the Bridger plant underground mine fault continues to need additional
23 roof control measures to ensure the safety of the miners while maintaining the
24 integrity of the underground mine. The additional roof control measures increase the
25 time it takes to extract the coal from the mine and added additional costs for the
26 supplies to ensure the safety of the miners. This change in operation will continue

1 into the future and thus the higher actual costs that are currently experienced must
2 be reflected in the future forecast.

3 **Q. Is anything else contributing to the changes in the per-unit cost of variable**
4 **production this year?**

5 A. Yes. Another contributing factor to the increased per-unit cost of coal production at
6 the Bridger plant and more significantly at the Valmy plant is a refinement in the
7 modeling to improve the accuracy of the forecasted NPSE. Since the APCU's
8 inception, the Company has modeled its coal plants in AURORA using a dispatch
9 cost consisting of two inputs: a fuel cost component stated in terms of \$/MMBtu and
10 an Operations and Maintenance ("O&M") expense component. In recognition that
11 the O&M cost component does not vary with the amount of production at each plant,
12 the Company this year has removed the O&M expense component from the
13 AURORA dispatch cost inputs and instead included it outside of the AURORA
14 analysis.

15 **Q. What is included in this O&M expense?**

16 A. The O&M expense that was historically included in the AURORA dispatch cost inputs
17 includes Oil, Handling, and Administrative and General ("OHAG") expenses at each
18 of the coal plants. These OHAG expenses are considered to be more fixed in nature
19 and are not directly driven by the annual output of the plant. While the expenses are
20 not directly correlated to the energy output of the plant, they are nonetheless
21 properly booked to FERC Account 501, Fuel Expense, which is considered a
22 variable power supply expense appropriately recovered through the APCU
23 mechanism.

24 **Q. Why is the Company removing the OHAG expenses from the AURORA inputs?**

25 A. The Company is removing these expenses from the AURORA inputs to better align
26 the AURORA dispatch of the coal-fired generation units with the actual operational

1 decisions that result in the dispatch of those plants and to produce a more accurate
2 forecast of NPSE to be included for recovery in the APCU.

3 **Q. Is the modified treatment of the OHAG expenses similar to the treatment of**
4 **other costs included for recovery in the APCU?**

5 A. Yes. The Company has historically included the cost of natural gas pipeline capacity
6 reservations as a fixed cost input to the APCU that is not included as a dispatch cost
7 component within the AURORA model. The total OHAG expenses for the APCU test
8 period were spread equally over the 12-month test period for each plant.

9 **Q. Is the change in modeling and recovery of OHAG expenses the main driver of**
10 **the increase in per-unit cost at Valmy?**

11 A. Yes it is.

12 **Q. Why are the OHAG expenses higher on a per-unit of output basis at Valmy as**
13 **compared to the coal other plants?**

14 A. The Valmy Operating Agreement, as amended, splits the plant operating costs per
15 the ownership percentage. Idaho Power owns 50 percent of the plant and pays 50
16 percent of the total operating costs, regardless of Idaho Power's utilization of the
17 plant. The operating costs include the fixed and variable costs associated with
18 running the plant. The exception is fuel costs which are allocated to each owner
19 based on their individual usage of the plant.

20 **Q. How does the natural gas price forecast for the 2016 October Update compare**
21 **to last year's October update?**

22 A. The Company has updated its natural gas price forecast, using the same
23 methodology that has been used in the past seven APCU filings. The methodology
24 uses the Northwest Power and Conservation Council, New York Mercantile
25 Exchange, Natural Gas Exchange, Energy Information Administration), and Moody's
26 forecast data to develop a normalized gas price. The high and low gas prices are

1 removed and the remaining three gas prices are averaged together. This
2 normalization process is intended to reduce volatility that may occur in the short-term
3 market. The Henry Hub price used for the 2015 October Update was \$4.07 per
4 MMBtu, while the Henry Hub price used in the 2016 October Update is \$3.06 per
5 MMBtu, a decrease of \$1.01 per MMBtu.

6 **Q. What factors have affected the decrease in natural gas prices from the last rate
7 proceeding?**

8 A. The decrease in gas prices between the 2015 October Update and the 2016 October
9 Update is the result of supply outpacing demand. This supply/demand relationship
10 also existed in the 2014 October Update and 2015 October Update, but at smaller
11 increments. Increases to the supply of natural gas have contributed to increases in
12 gas storage levels, which serves to further reduce future natural gas prices.

13 PURPA Expense

14 **Q. Please describe any changes to PURPA generation since last year's October
15 Update.**

16 A. Last year's October Update included 258 average megawatts ("aMW") of available
17 PURPA generation whereas PURPA generation included in the 2016 October
18 Update is 361 aMW, an increase of 102 aMW since last year's October Update.

19 **Q. How has the annual PURPA expense changed from last year's October
20 Update?**

21 A. As a result of the increase in PURPA generation, the annual PURPA expenses have
22 increased from \$172.8 million to \$208.9 million, an increase of \$36.1 million.

23 **Q. What drove the changes in PURPA generation since last year's October
24 Update?**

25 A. The addition of 23 new PURPA contracts drove the changes in PURPA generation
26 and expenses. A breakdown of the 23 new contracts includes: 14 new solar

1 projects, 5 new wind projects, 3 new hydro projects, and 1 cogeneration project
2 whose contract renewal was not included in last year's October Update.

3 Normalized Load

4 **Q. Please describe the changes in the Company's system loads since last year's**
5 **October Update.**

6 A. The Company's annual normalized system load used in last year's October Update
7 was 1,798 aMW. The Company's annual normalized system load used in this year's
8 October Update is 1,815 aMW, an increase of 17 aMW. The increase of 17 aMW is
9 about a one percent increase in loads between the two test years.

10 **Q. What factors are contributing to the change in the load compared to last year's**
11 **October Update?**

12 A. The Company's service area has experienced one to two percent sales growth over
13 the last few years. The commercial, irrigation, and industrial sectors are forecast to
14 be the main contributors to this sales growth.

15 Other

16 **Q. What other AURORA inputs were modified from last year's October Update?**

17 A. The Company updated the heat rates, maintenance rates, and forced outage rates
18 for its thermal plants, which is a consistent practice for every APCU filing.

19 Modeling Results

20 **Q. Have you prepared an exhibit that summarizes the results of the AURORA**
21 **model with all of the updated inputs described above?**

22 A. Yes. Exhibit 101 shows the results of the AURORA modeling determination of
23 normalized NPSE for the April 2016 through March 2017 test year. Exhibit 101
24 presents the summary of results containing average variable power supply
25 generation output and expenses based on 87 historical water conditions.
26

1 **Q. Please summarize the sources and disposition of energy shown on Exhibit**
2 **101.**

3 A. As can be seen on Exhibit 101, hydro generation supplies 8.7 million MWh,
4 approximately 47 percent (8.7 million MWh / 18.3 million MWh = 47 percent) of the
5 generation mix. Thermal generation supplies 5.6 million MWh (Bridger 2.6,
6 Boardman 0.3, Valmy 0.3, Langley Gulch 2.1, Danskin 0.2, Bennett Mountain 0.1),
7 approximately 31 percent (5.6 million MWh / 18.3 million MWh = 31 percent) of the
8 generation mix. Purchases of power are made up of short-term and longer-term
9 market purchases, Purchased Power Agreements (“PPA”), and PURPA. PURPA
10 purchases reflect normalized and annualized generation levels and account for
11 nearly 3.2 million MWh. PURPA purchases are not included on Exhibit 101;
12 however, when combined with market purchases of 0.9 million MWh, total purchases
13 amount to 4.1 million MWh (3.2 million MWh + 0.9 million MWh = 4.1 million MWh) or
14 approximately 22 percent (4.1 million MWh / 18.3 million MWh = 22 percent) of the
15 generation mix. Of the 18.3 million MWh generated by the system, 15.9 million MWh
16 are utilized for system loads while nearly 2.4 million MWh are sold as surplus.

17 **2016 Base Net Power Supply Expenses**

18 **Q. How are the Base Net Power Supply Expenses to be calculated for the October**
19 **Update portion of the APCU according to the settlement stipulation approved**
20 **in Order No. 08-238?**

21 A. Per the settlement stipulation approved in Order No. 08-238, the output of the
22 AURORA model will be used to determine net power supply average dispatch cost
23 for normal loads and average streamflow conditions; and the wholesale electric
24 prices for purchased power and surplus sales determined by the Company’s power
25 supply model will be replaced with an average forward electric price curve (UE 195
26 Stipulation, p. 5).

1 Re-pricing Based on a Forward Price Curve

2 **Q. Please describe the re-pricing methodology mentioned above.**

3 A. The Company is required to re-price the AURORA generated market purchase price
4 and surplus sales volumes with a forward based price curve using the Mid-Columbia
5 (“Mid-C”) hub. This methodology prescribes the use of a one-year average of the
6 daily Mid-C forward price curves calculated from the previous 12 months of daily
7 Mid-C heavy load (“Mid-C HL”) and light load (“Mid-C LL”) forward price curves for
8 the period starting in the April immediately following the current April through March
9 test period. Forward prices are then adjusted for inflation back one year using the
10 most recent Producer Price Index for Electric Power.

11 The re-pricing of market prices in the 2016 October Update is based upon the
12 forward price curves from April 2017 through March 2018 as shown in Exhibit 102,
13 which were then discounted for inflation back to April 2016 through March 2017
14 according to the quarterly inflation indices provided in Exhibit 103.

15 **Q. What is the monthly average forward price that is used for the re-pricing of
16 purchased power and surplus sales volumes?**

17 A. Exhibit 104 shows the monthly prices that are used for the re-pricing of purchased
18 power and surplus sales volumes for the 2016 October Update and the prices range
19 from a low of \$12 to a high of \$38.

20 **Q. How does the re-pricing of purchased power and surplus sales, using a
21 “normal” forward price curve, change purchased power expenses and surplus
22 sales revenues as modeled by AURORA?**

23 A. Exhibit 101 shows the purchased power expenses and surplus sales revenues
24 before re-pricing as determined by the AURORA modeling process. Exhibit 105
25 shows the same normalized generation dispatch with purchased power and surplus
26 sales re-priced using the normalized forward price curve shown in Exhibit 104. A

1 comparison of Exhibit 101 and Exhibit 105 demonstrates the changes due to re-
2 pricing. Purchased power expenses increased by \$1.8 million, moving from \$8.3
3 million to \$10.1 million. Surplus sales revenues increase by \$6.2 million, moving
4 from \$54.8 million to \$61.0 million. In this case, the NPSE resulting from the re-
5 pricing methodology shown on Exhibit 105 is a decrease in NPSE of \$4.4 million or
6 approximately \$0.30 per MWh as compared to the AURORA generated expectation
7 shown on Exhibit 101. The difference for the re-pricing of purchased power of \$1.8
8 million and surplus sales of \$6.2 million are shown on Exhibit 106, Column J.

9 Per-Unit Cost Calculation

10 **Q. What is the per-unit cost when you combine all of the quantifications**
11 **described earlier?**

12 A. Exhibit 105 shows that the normalized annual sales at customer level for the April
13 2016 through March 2017 test year are 14,616,871 MWh. Based upon test year
14 sales, the cost per unit for the 2016 October Update to become effective on June 1,
15 2016, is \$24.08 per MWh ($\$352.0 \text{ million} / 14.617 \text{ million MWh} = \24.08 per MWh).

16 **Q. How does this \$24.08 per MWh October Update compare to the October Update**
17 **that resulted from last year's computation?**

18 A. The October Update unit cost which became effective June 1, 2015, was \$23.44 per
19 MWh based upon a determination of total net power supply expenses of \$339.5
20 million. This year's October Update per unit cost of \$24.08 per MWh equates to an
21 increase of \$0.64 per MWh ($\$24.08 - 23.44 = \0.64) or a \$12.5 million increase in
22 system net power supply expenses from last year's October Update.

23 Quantification and Discussion of the Revenue Deficiency

24 **Q. What is the revenue deficiency that results from applying the 2016 October**
25 **Update per-unit cost to forecast Oregon jurisdictional sales?**

26

1 A. The revenue deficiency for the October Update is calculated by multiplying the
2 incremental per-unit cost of \$0.64 per MWh by the sales for the April 2016 through
3 March 2017 test period of 647,119.324 MWh and comparing the product of that
4 calculation to the revenue that would exist under the current October Update rates.
5 The result of this comparison indicates a need for an additional \$0.41 million
6 annually from Oregon customers.

7 **Q. What can be concluded from the information included on Exhibit 106?**

8 A. Exhibit 106 compares the AURORA developed results, the re-pricing of purchased
9 power and surplus sales, and the differences between the 2015 October Update and
10 the 2016 October Update. A high level analysis based on the information shown in
11 Exhibit 106 suggests that lower priced natural gas generation combined with
12 additional PURPA generation have replaced more coal generation when compared
13 to last year's October Update levels.

14 **Q. What are some of the differences in the manner in which resources are
15 dispatched as shown on Exhibit 106?**

16 A. Column H of Exhibit 106 shows the following: a decrease in coal expenses of \$36.0
17 million associated with a 1.7 million MWh reduction in generation; an increase in
18 natural gas expenses of \$13.7 million associated with an increase of 1.3 million MWh
19 in generation; a decrease in purchased power expenses of \$1.9 million associated
20 with a reduction of 0.05 million MWh; an increase in PURPA expenses of \$36.1
21 million associated with an increase of 0.9 million MWh; and finally a slight decrease
22 in surplus sales revenue of \$0.6 million occurred even though surplus sales
23 increased by 0.3 million MWh.

24 **Q. Can you elaborate more on the changes in generation from the 2015 October
25 Update to the 2016 October Update?**

26

1 A. In order to illustrate the changes in generation, Columns D (2015) and F (2016)
2 calculate the percentage of generation compared to total system load. For example,
3 Column D, line 1 shows hydro generation provided 55 percent of the generation to
4 meet the total system load of 15,793,689, which is calculated by taking $(8,674,036 /$
5 $15,793,689 = 55$ percent). Based on the 2016 October Update results, hydro
6 generation moved from 55 percent to 54 percent; coal generation moved from 31
7 percent to 20 percent; natural gas generation moved from 7 percent to 15 percent;
8 purchased power and PPA decreased slightly from 6 percent to 5 percent; PURPA
9 generation moved from 14 percent to 20 percent; and lastly surplus sales increased
10 from 13 percent to 15 percent. This comparison between resource type and total
11 system load shows that natural gas and PURPA resources are dispatched more
12 frequently rather than coal resources.

13 **Q. Are the relative changes in expenses between resource types consistent with**
14 **the changes in output?**

15 A. Yes. The changes in expenses shown in Columns D and F are as follows: coal
16 moved from 39 percent to 27 percent of the total; natural gas moved from 13 percent
17 to 16 percent; purchased power and PPA decreased slightly from 16 percent to 14
18 percent; PURPA moved from 51 percent to 59 percent; and surplus sales moved
19 from 18 percent to 17 percent. The majority of movement in expenses is related to
20 coal, natural gas, and PURPA, which is consistent with the changes in generation.

21 **Q. If less expensive natural gas-fired generation is replacing coal generation, why**
22 **are NPSE increasing as compared to last year's October Update?**

23 A. The forecasted natural gas prices discussed earlier in my testimony produce an
24 average per-unit cost of \$19.39 per MWh at the Langley Gulch plant, whereas the
25 coal per-unit cost varies from \$25.32 to \$47.18 per MWh. If all of the coal generation
26 was replaced with only cheaper natural gas generation, total NPSE would have been

1 lower. However, the coal generation was also offset by additional PURPA
2 generation, a must take resource regardless of its per-unit cost, which in this
3 instance is \$66 per MWh. As you can see in column H in Exhibit 106, total coal
4 generation decreased 1.7 million MWh while natural gas and PURPA generation
5 combined increased 2.1 million MWh. The increase in both natural gas and PURPA
6 generation more than offset the 1.7 million MWh reduction in coal generation and
7 resulted in a 0.3 million MWh increase in surplus sales volume. The overall effect of
8 replacing coal generation with lower priced natural gas and higher priced PURPA
9 generation, as well as a slight increase in surplus sales revenue between the 2015
10 October Update and 2016 October Update, creates a revenue deficiency of \$0.41
11 million.

12 **Q. Did the Company comply with the methodology in Order No. 08-238 when it**
13 **performed its analysis to determine the NPSE for the 2016 October Update?**

14 A. Yes. The Company has complied with the methodology detailed in Order No. 08-238
15 for calculating this year's October Update.

16 **Rate Implementation**

17 **Q. What method of allocation are you proposing to spread the incremental**
18 **revenue requirement associated with the October Update to the various**
19 **customer classes?**

20 A. I am proposing to allocate the revenue deficiency associated with the 2016 October
21 Update according to the revenue spread methodology approved by the Commission
22 in UE 214, Order No. 10-191. Order No. 10-191 established a revenue spread
23 methodology whereby the revenue deficiency for the October Update is allocated to
24 individual customer classes on the basis of the total generation-related revenue
25 requirement approved in the Company's last general rate case. In this instance, the
26 Company's last general rate case, UE 233, was a settled case in which parties did

1 not adopt the Company's class cost-of-service methodology, but rather agreed to a
2 revenue spread methodology that was set forth in Exhibit B to the Partial Stipulation
3 filed on February 1, 2012 ("Exhibit B"). In light of the stipulated revenue spread, the
4 Company has utilized the total generation-related revenue requirement detailed on
5 Exhibit B to apportion the October Update revenue requirement to each customer
6 class. The proposed revenue spread resulting from the application of the stipulated
7 methodology in UE 233 is shown on Exhibit 107.

8 **Q. Was the incremental spread of the revenue requirement mentioned above**
9 **approved in prior years' APCU filings?**

10 A. Yes. The Company used this same methodology in UE 242, UE 257, UE 279, and
11 UE 293. This methodology was approved in Order No. 12-176 on May 18, 2012.

12 **Q. What is the overall revenue impact in percentage terms, of this year's October**
13 **Update compared to last year's October Update using the rate spread**
14 **methodology described above?**

15 A. The overall revenue impact of the October Update compared to last year's October
16 Update is a 0.79 percent increase.

17 **Q. Have you prepared an exhibit showing the summary of revenue impact**
18 **resulting from the October Update proposed by the Company?**

19 A. Yes. Exhibit 108 provides a summary of the revenue change resulting from this
20 year's October Update as compared to current revenue.

21 **Q. Does this conclude your testimony?**

22 A. Yes, it does.
23
24
25
26

Idaho Power/101
Witness: Kelley K. Noe

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe

Idaho Power Company's AURORA Modeled Power Supply Expenses for
April 1, 2016 – March 31, 2017
Normalized Loads Over 87 Water Year Conditions

October 23, 2015

IPCO POWER SUPPLY EXPENSES FOR APRIL 1, 2016 -- MARCH 31, 2017 (Multiple Gas Prices/87 Years of Hydro Conditions)
AURORA Modeled Results - October Update
AVERAGE

	April	May	June	July	August	September	October	November	December	January	February	March	Annual
Hydroelectric Generation (MWh)	888,646.3	951,620.1	924,367.9	702,808.8	481,416.1	564,228.6	545,385.6	459,712.3	681,250.5	761,093.6	840,200.9	861,358.0	8,662,088.8
Bridger													
Energy (MWh)	79,557.9	66,797.2	144,363.2	342,180.1	343,162.3	185,393.5	159,338.9	268,683.0	332,459.2	270,937.5	203,864.8	226,049.7	2,622,787.2
Expense (\$ x 1000)	\$ 2,234.2	\$ 1,878.6	\$ 4,007.7	\$ 9,361.4	\$ 9,378.6	\$ 5,106.3	\$ 4,418.4	\$ 7,398.6	\$ 9,054.5	\$ 7,393.2	\$ 5,550.9	\$ 6,178.5	\$ 71,961.0
O&M Expense (\$ x 1000)	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 294.9	\$ 3,538.4
Total Expense (\$ x 1000)	\$ 2,529.1	\$ 2,173.5	\$ 4,302.6	\$ 9,656.3	\$ 9,673.5	\$ 5,401.2	\$ 4,713.2	\$ 7,693.5	\$ 9,349.3	\$ 7,688.1	\$ 5,845.8	\$ 6,473.4	\$ 75,499.4
Boardman													
Energy (MWh)	5,836.6	4,527.5	17,974.9	34,169.3	35,115.7	27,504.0	24,819.7	29,496.2	33,368.5	21,119.1	16,063.2	17,397.9	267,392.6
Expense (\$ x 1000)	\$ 147.0	\$ 116.3	\$ 451.7	\$ 841.5	\$ 864.5	\$ 683.2	\$ 618.4	\$ 730.4	\$ 822.1	\$ 578.4	\$ 440.2	\$ 477.2	\$ 6,771.1
O&M Expense (\$ x 1000)	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.4
Total Expense (\$ x 1000)	\$ 147.1	\$ 116.3	\$ 451.8	\$ 841.5	\$ 864.5	\$ 683.3	\$ 618.5	\$ 730.4	\$ 822.1	\$ 578.5	\$ 440.2	\$ 477.2	\$ 6,771.4
Valmy													
Energy (MWh)	2,969.3	5,047.6	11,348.2	47,110.6	42,456.9	21,566.4	18,075.9	27,462.8	46,732.3	24,800.5	19,317.7	9,444.5	276,332.7
Expense (\$ x 1000)	\$ 103.7	\$ 175.2	\$ 375.4	\$ 1,502.7	\$ 1,357.3	\$ 695.3	\$ 599.6	\$ 898.3	\$ 1,475.9	\$ 814.5	\$ 635.2	\$ 318.5	\$ 8,951.6
O&M Expense (\$ x 1000)	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 340.42	\$ 4,085.0
Total Expense (\$ x 1000)	\$ 444.2	\$ 515.6	\$ 715.8	\$ 1,843.1	\$ 1,697.7	\$ 1,035.7	\$ 940.1	\$ 1,238.7	\$ 1,816.3	\$ 1,154.9	\$ 975.6	\$ 658.9	\$ 13,036.6
Langley Gulch													
Energy (MWh)	164,244.7	163,071.0	183,443.5	198,359.4	198,271.9	192,123.9	195,862.2	166,960.2	167,617.6	157,534.8	148,057.7	167,059.2	2,102,606.2
Expense (\$ x 1000)	\$ 2,890.4	\$ 2,741.9	\$ 3,118.8	\$ 3,372.2	\$ 3,498.5	\$ 3,361.9	\$ 3,475.9	\$ 3,609.5	\$ 4,032.5	\$ 3,720.2	\$ 3,303.1	\$ 3,646.7	\$ 40,771.7
Danskin													
Energy (MWh)	2,014.8	1,834.5	14,073.7	68,290.7	59,323.9	34,385.0	24,843.3	10,178.8	5,044.0	1,594.0	2,613.9	850.1	225,046.7
Expense (\$ x 1000)	\$ 37.5	\$ 36.7	\$ 320.0	\$ 1,782.7	\$ 1,524.8	\$ 833.8	\$ 546.8	\$ 236.9	\$ 123.8	\$ 39.9	\$ 65.7	\$ 20.0	\$ 5,568.5
Bennett Mountain													
Energy (MWh)	246.2	99.5	4,654.9	39,949.6	29,733.0	13,332.8	9,945.6	4,445.8	1,325.2	187.7	279.8	23.5	104,223.6
Expense (\$ x 1000)	\$ 4.4	\$ 2.0	\$ 99.4	\$ 1,008.6	\$ 717.1	\$ 293.9	\$ 199.5	\$ 97.6	\$ 31.6	\$ 4.4	\$ 6.5	\$ 0.6	\$ 2,465.6
Fixed Capacity Charge - Gas Transportation (\$ x 1000)	\$ 735.4	\$ 759.4	\$ 744.4	\$ 778.0	\$ 778.0	\$ 753.4	\$ 759.4	\$ 735.4	\$ 759.4	\$ 759.4	\$ 687.3	\$ 759.4	\$ 9,008.8
Purchased Power (Excluding PURPA)													
Market Energy (MWh)	2,359.1	5,648.9	18,587.5	78,669.9	76,101.7	37,282.4	8,040.5	38,850.9	11,453.0	29,043.1	1,972.9	3,220.2	311,230.1
Elkhorn Wind Energy (MWh)	25,790.0	24,592.0	24,055.4	26,880.8	24,330.6	20,734.6	21,842.2	29,820.2	29,732.8	24,269.2	24,158.8	28,532.8	304,739.1
Neal Hot Springs Energy (MWh)	14,424.2	10,940.5	11,065.3	7,822.4	9,924.6	11,286.0	12,896.6	16,671.7	17,970.0	18,765.7	16,385.0	16,782.0	164,934.1
Raft River Geothermal Energy (MWh)	6,213.3	5,111.2	5,097.5	5,661.1	5,734.4	5,757.2	7,594.7	6,634.5	6,897.6	6,890.5	6,324.0	6,504.2	74,420.3
Total Energy Excl. PURPA (MWh)	48,786.6	46,292.5	58,805.7	119,034.2	116,091.4	75,060.2	50,374.0	91,977.4	66,053.3	78,968.5	48,840.6	55,039.2	855,323.6
Market Expense (\$ x 1000)	\$ 54.9	\$ 126.5	\$ 481.0	\$ 2,233.8	\$ 2,055.5	\$ 1,011.1	\$ 197.0	\$ 1,023.1	\$ 285.9	\$ 714.0	\$ 45.7	\$ 77.6	\$ 8,306.2
Elkhorn Wind Expense (\$ x 1000)	\$ 1,115.4	\$ 1,063.6	\$ 1,415.7	\$ 1,898.1	\$ 1,718.0	\$ 1,220.2	\$ 1,285.4	\$ 2,105.6	\$ 2,099.4	\$ 1,471.0	\$ 1,464.3	\$ 1,271.1	\$ 18,127.7
Neal Hot Springs Expense (\$ x 1000)	\$ 1,155.2	\$ 876.2	\$ 1,209.1	\$ 1,025.7	\$ 1,301.3	\$ 1,233.2	\$ 1,409.2	\$ 2,186.0	\$ 2,356.2	\$ 2,098.6	\$ 1,832.3	\$ 1,375.6	\$ 18,058.7
Raft River Geothermal Expense (\$ x 1000)	\$ 289.1	\$ 237.8	\$ 322.7	\$ 430.0	\$ 435.6	\$ 364.4	\$ 480.7	\$ 504.0	\$ 523.9	\$ 445.3	\$ 408.7	\$ 309.0	\$ 4,751.3
Total Expense Excl. PURPA (\$ x 1000)	\$ 2,614.7	\$ 2,304.2	\$ 3,428.4	\$ 5,587.5	\$ 5,510.4	\$ 3,829.0	\$ 3,372.4	\$ 5,818.6	\$ 5,265.5	\$ 4,728.9	\$ 3,751.0	\$ 3,033.3	\$ 49,243.9
Surplus Sales													
Energy (MWh)	398,365.8	296,853.2	234,499.1	43,367.8	35,296.7	57,186.7	181,971.9	69,697.5	170,149.0	151,687.5	327,374.2	408,802.6	2,375,252.0
Revenue Including Transmission Expenses (\$ x 1000)	\$ 7,947.2	\$ 5,595.2	\$ 5,061.9	\$ 1,213.1	\$ 1,069.7	\$ 1,502.7	\$ 4,763.2	\$ 1,967.5	\$ 5,139.6	\$ 4,064.9	\$ 8,522.6	\$ 10,313.9	\$ 57,161.7
Transmission Expenses (\$ x 1000)	\$ 398.4	\$ 296.9	\$ 234.5	\$ 43.4	\$ 35.3	\$ 57.2	\$ 182.0	\$ 69.7	\$ 170.1	\$ 151.7	\$ 327.4	\$ 408.8	\$ 2,375.3
Revenue Excluding Transmission Expenses (\$ x 1000)	\$ 7,548.8	\$ 5,298.4	\$ 4,827.4	\$ 1,169.7	\$ 1,034.4	\$ 1,445.5	\$ 4,581.2	\$ 1,897.8	\$ 4,969.5	\$ 3,913.3	\$ 8,195.3	\$ 9,905.1	\$ 54,786.4
Net Power Supply Expenses (\$ x 1000)	\$ 1,853.9	\$ 3,351.1	\$ 8,353.7	\$ 23,700.2	\$ 23,230.1	\$ 14,746.6	\$ 10,044.5	\$ 18,262.7	\$ 17,231.1	\$ 14,761.1	\$ 6,880.1	\$ 5,164.5	\$ 147,579.4

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe

Mid-Columbia Heavy and Light Load
Forward Price Curves

October 23, 2015

Mid-Columbia Heavy Load and Light Load Daily Forward Curves
 April 2016 - March 2017

Idaho Power/102
 Noe/2

MidC HL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
12/15/2014	29.1984	28.4333	26.8457	39.7003	41.3343	41.3782	39.3655	40.4506	41.5436	41.9502	42.6185	39.0729
12/16/2014	29.1984	28.4333	26.8457	39.7003	41.3343	41.3782	39.3655	40.4506	41.5436	41.9502	42.6185	39.0729
12/17/2014	29.2381	28.4719	26.8823	39.7543	41.3906	41.4345	39.4191	40.5056	41.6001	42.0022	42.6713	39.1214
12/18/2014	29.2381	28.4719	26.8823	39.7543	41.3906	41.4345	39.4191	40.5056	41.6001	42.0022	42.6713	39.1214
12/19/2014	29.2282	28.4623	26.8731	39.7408	41.3765	41.4204	39.4057	40.4919	41.586	42.0022	42.6713	39.1214
12/22/2014	28.6919	27.94	26.38	39.0116	40.6173	40.6604	38.6826	39.7489	40.823	41.2865	41.9443	38.4548
12/23/2014	28.7117	27.9594	26.3983	39.0386	40.6454	40.6886	38.7094	39.7764	40.8512	41.3256	41.9839	38.4912
12/24/2014	28.7117	27.9594	26.3983	39.0386	40.6454	40.6886	38.7094	39.7764	40.8512	41.3256	41.9839	38.4912
12/26/2014	28.6124	27.8627	26.307	38.9036	40.5048	40.5478	38.5755	39.6389	40.7099	41.1825	41.8385	38.3579
12/29/2014	28.6124	27.8627	26.307	38.9036	40.5048	40.5478	38.5755	39.6389	40.7099	41.1825	41.8385	38.3579
12/30/2014	28.4866	27.7402	26.1913	38.7326	40.3268	40.3695	38.4059	39.4646	40.5309	41.0393	41.6931	38.2246
12/31/2014	27.7914	27.0632	25.5521	37.7873	39.3426	39.3843	37.4686	38.5015	39.5418	40.1155	40.7546	37.3641
1/2/2015	27.7914	27.0632	25.5521	37.7873	39.3426	39.3843	37.4686	38.5015	39.5418	40.1155	40.7546	37.3641
1/5/2015	27.6425	26.9181	25.4152	37.5848	39.1317	39.1732	37.2678	38.2951	39.3298	39.9073	40.5431	37.1702
1/6/2015	27.3942	26.6763	25.1869	37.2472	38.7802	38.8214	36.933	37.9511	38.9766	39.582	40.2126	36.8672
1/7/2015	27.2849	26.5699	25.0865	37.0986	38.6256	38.6666	36.7858	37.7998	38.8211	39.4389	40.0672	36.7339
1/8/2015	26.9969	26.2895	24.8217	36.707	38.2179	38.2584	36.3975	37.4008	38.4114	39.0485	39.6706	36.3703
1/9/2015	26.9274	26.2218	24.7577	36.6125	38.1194	38.1599	36.3037	37.3045	38.3125	38.9574	39.5781	36.2855
1/12/2015	26.8181	26.1154	24.6573	36.464	37.9648	38.0051	36.1564	37.1531	38.157	38.8143	39.4327	36.1522
1/13/2015	26.5699	25.8736	24.429	36.1264	37.6133	37.6532	35.8217	36.8091	37.8038	38.2678	38.8774	35.6431
1/14/2015	26.5301	25.8349	24.3925	36.0724	37.5571	37.5969	35.7681	36.7541	37.7472	38.2158	38.8246	35.5947
1/15/2015	26.5301	25.8349	24.3925	36.0724	37.5571	37.5969	35.7681	36.7541	37.7472	38.2158	38.8246	35.5947
1/16/2015	26.5301	25.8349	24.3925	36.0724	37.5571	37.5969	35.7681	36.7541	37.7472	38.2158	38.8246	35.5947
1/20/2015	26.5533	25.8575	24.4138	36.1039	37.5899	37.6298	35.7994	36.7862	37.7802	38.2505	38.8598	35.627
1/21/2015	25.8813	25.2031	23.7959	35.1901	36.6385	36.6774	34.8934	35.8552	36.824	36.4852	37.0664	33.9828
1/22/2015	25.8548	25.1773	23.7716	35.1541	36.601	36.6399	34.8577	35.8185	36.7864	36.4548	37.0356	33.9545
1/23/2015	25.8548	25.1773	23.7716	35.1541	36.601	36.6399	34.8577	35.8185	36.7864	36.4548	37.0356	33.9545
1/26/2015	25.8548	25.1773	23.7716	35.1541	36.601	36.6399	34.8577	35.8185	36.7864	36.4548	37.0356	33.9545
1/27/2015	25.921	25.2418	23.8324	35.2441	36.6948	36.7337	34.9469	35.9102	36.8806	36.5372	37.1193	34.0313
1/28/2015	25.921	25.2418	23.8324	35.2441	36.6948	36.7337	34.9469	35.9102	36.8806	36.5372	37.1193	34.0313
1/29/2015	25.6231	24.9516	23.5585	34.839	36.273	36.3115	34.5452	35.4975	36.4566	36.1469	36.7227	33.6677
1/30/2015	25.6231	24.9516	23.5585	34.839	36.273	36.3115	34.5452	35.4975	36.4566	36.1469	36.7227	33.6677
2/2/2015	25.4311	24.7647	23.382	34.578	36.0012	36.0394	34.2864	35.2315	36.1835	35.891	36.4628	33.4293
2/3/2015	25.4708	24.8033	23.4185	34.632	36.0574	36.0957	34.3399	35.2865	36.24	35.943	36.5156	33.4778
2/4/2015	25.2424	24.5809	23.2085	34.3214	35.7341	35.772	34.032	34.9701	35.915	35.6481	36.216	33.2031
2/5/2015	25.2391	24.5777	23.2054	34.3169	35.7294	35.7673	34.0275	34.9655	35.9103	35.6394	36.2072	33.195
2/6/2015	25.1993	24.539	23.1689	34.2629	35.6731	35.711	33.9739	34.9104	35.8537	35.5874	36.1543	33.1466
2/9/2015	25.1993	24.539	23.1689	34.2629	35.6731	35.711	33.9739	34.9104	35.8537	35.5874	36.1543	33.1466
2/10/2015	25.1993	24.539	23.1689	34.2629	35.6731	35.711	33.9739	34.9104	35.8537	35.5874	36.1543	33.1466
2/11/2015	25.2391	24.5777	23.2054	34.3169	35.7294	35.7673	34.0275	34.9655	35.9103	35.6394	36.2072	33.195
2/12/2015	25.1993	24.539	23.1689	34.2629	35.6731	35.711	33.9739	34.9104	35.8537	35.5874	36.1543	33.1466
2/13/2015	25.1762	24.5164	23.1476	34.2314	35.6403	35.6781	33.9427	34.8783	35.8208	35.5527	36.1191	33.1142
2/17/2015	25.0272	24.3714	23.0106	34.0288	35.4294	35.467	33.7419	34.672	35.6088	35.3488	35.912	32.9244
2/18/2015	25.2457	24.5841	23.2115	34.3259	35.7387	35.7767	34.0364	34.9746	35.9197	35.6394	36.2072	33.195
2/19/2015	25.6131	24.942	23.5494	34.8255	36.2589	36.2974	34.5318	35.4837	36.4425	36.1165	36.6919	33.6394
2/20/2015	25.5933	24.9226	23.5311	34.7985	36.2308	36.2693	34.5051	35.4562	36.4143	36.0905	36.6654	33.6152
2/23/2015	25.5933	24.9226	23.5311	34.7985	36.2308	36.2693	34.5051	35.4562	36.4143	36.0905	36.6654	33.6152
2/24/2015	25.5933	24.9226	23.5311	34.7985	36.2308	36.2693	34.5051	35.4562	36.4143	36.0905	36.6654	33.6152
2/25/2015	27.25	25.85	25.85	34.05	38.6	34.75	31.55	35.2	39.85	38.35	35.35	31.45
2/26/2015	27.2	25.8	25.8	34	38.5	34.7	31.5	35.15	39.75	38.3	35.3	31.4
2/27/2015	27.1	25.7	25.7	33.85	38.35	34.55	31.4	35	39.6	38.15	35.15	31.3
3/2/2015	27	25.6	25.6	33.75	38.25	34.45	31.3	34.9	39.5	38.05	35.05	31.2
3/3/2015	27	25.6	25.6	33.75	38.25	34.45	31.3	34.9	39.5	38.05	35.05	31.2
3/4/2015	27.2	25.8	25.8	34	38.55	34.7	31.55	35.15	39.8	38.3	35.3	31.4

Mid-Columbia Heavy Load and Light Load Daily Forward Curves
 April 2016 - March 2017

Idaho Power/102
 Noe/3

MidC HL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
3/5/2015	27	25.85	25.85	34.05	38.6	34.75	31.6	35.2	39.85	38.35	35.35	31.45
3/6/2015	26.8	25.65	25.65	33.8	38.3	34.5	31.35	34.95	39.55	38.1	35.1	31.25
3/9/2015	26.65	25.5	25.5	33.6	38.1	34.3	31.2	34.75	39.35	37.9	34.95	31.1
3/10/2015	26.65	25.5	25.5	33.6	38.1	34.3	31.2	34.75	39.35	37.9	34.95	31.1
3/11/2015	26.9	25.75	25.75	33.9	38.45	34.6	31.5	35.05	39.7	38.25	35.25	31.35
3/12/2015	26.9	25.75	25.75	33.9	38.45	34.6	31.5	35.05	39.7	38.25	35.25	31.35
3/13/2015	26.95	25.8	25.8	34	38.55	34.7	31.55	35.15	39.8	38.35	35.3	31.4
3/16/2015	27.1	25.95	25.95	34.15	38.75	34.85	31.7	35.35	40	38.55	35.45	31.55
3/17/2015	27.1	25.95	25.95	34.2	38.8	34.9	31.7	35.4	40.05	38.6	35.45	31.55
3/18/2015	26.95	25.8	25.8	34	38.55	34.7	31.5	35.15	39.8	38.35	35.25	31.35
3/19/2015	26.7	25.55	25.55	33.7	38.2	34.4	31.2	34.85	39.45	38.05	34.95	31.1
3/20/2015	27.05	25.9	25.9	34.15	38.7	34.85	31.6	35.3	39.95	38.5	35.35	31.5
3/23/2015	27.05	25.9	25.9	34.15	38.7	34.85	31.6	35.3	39.95	38.5	35.35	31.5
3/24/2015	27.2	26.05	26.05	34.35	38.95	35.05	31.8	35.5	40.2	38.7	35.55	31.65
3/25/2015	27.15	26	26	34.3	38.9	35	31.75	35.45	40.15	38.65	35.5	31.6
3/26/2015	26.75	25.6	25.6	33.8	38.35	34.5	31.3	34.95	39.55	38.1	35	31.15
3/27/2015	26.6	25.45	25.45	33.6	38.15	34.3	31.15	34.75	39.35	37.9	34.8	31
3/30/2015	26.6	25.45	25.45	33.6	38.1	34.3	31.15	34.75	39.3	37.85	34.8	31
3/31/2015	26.55	25.4	25.4	33.55	38.05	34.25	31.1	34.7	39.25	37.8	34.75	30.95
4/1/2015	26.4	25.25	25.25	33.35	37.8	34.05	30.9	34.5	39	37.6	34.55	30.8
4/2/2015	26.45	25.3	25.3	33.4	37.9	34.15	30.95	34.6	39.1	37.7	34.6	30.85
4/3/2015	26.45	25.3	25.3	33.4	37.9	34.15	30.95	34.6	39.1	37.7	34.6	30.85
4/6/2015	26.3	25.15	25.15	33.25	37.7	34	30.8	34.4	38.9	37.5	34.45	30.7
4/7/2015	26.3	25.15	25.15	33.25	37.65	34	30.8	34.4	38.85	37.5	34.45	30.7
4/8/2015	26.15	25.05	25.05	33.1	37.45	33.85	30.65	34.25	38.65	37.35	34.3	30.55
4/9/2015	25.85	24.75	24.75	32.75	37.05	33.45	30.3	33.85	38.2	36.95	33.95	30.25
4/10/2015	25.9	24.8	24.8	32.8	37.1	33.5	30.35	33.9	38.25	37	34	30.3
4/13/2015	25.55	24.5	24.5	32.4	36.6	33.05	29.95	33.45	37.75	36.55	33.6	29.95
4/14/2015	25.65	24.6	24.6	32.55	36.75	33.2	30.05	33.6	37.9	36.7	33.7	30.05
4/15/2015	25.7	24.65	24.65	32.6	36.85	33.25	30.1	33.65	38	36.75	33.75	30.1
4/16/2015	25.75	24.7	24.7	32.65	36.9	33.3	30.15	33.7	38.05	36.8	33.8	30.15
4/17/2015	25.75	24.7	24.7	32.65	36.9	33.3	30.15	33.7	38.05	36.8	33.8	30.15
4/20/2015	25.65	24.6	24.6	32.55	36.75	33.2	30.05	33.6	37.9	36.7	33.7	30.05
4/21/2015	25.8	24.75	24.75	32.1	36.25	32.75	30.2	33.8	38.1	36.7	33.7	30.05
4/22/2015	25.95	24.9	24.9	32.25	36.45	32.95	30.35	34	38.3	36.9	33.85	30.2
4/23/2015	25.95	24.9	24.9	32.25	36.45	32.95	30.35	34	38.3	36.9	33.85	30.2
4/24/2015	26.1	25.05	25.05	32.45	36.65	33.15	30.55	34.2	38.55	37.1	34.05	30.35
4/27/2015	26.1	25.05	25.05	32.45	36.65	33.15	30.55	34.2	38.55	37.1	34.05	30.35
4/28/2015	26.2	25.15	25.15	32.55	36.75	33.25	30.65	34.3	38.65	37.2	34.15	30.45
4/29/2015	26.6	25.5	25.5	33	37.3	33.75	31.1	34.8	39.2	37.7	34.6	30.85
4/30/2015	26.7	25.6	25.6	33.15	37.45	33.9	31.25	34.95	39.35	37.85	34.75	30.95
5/1/2015	26.7	25.6	25.6	33.15	37.45	33.9	29.75	33.7	38.1	37.5	34.45	30.65
5/4/2015	26.8	25.7	25.7	33.3	37.6	34.05	29.9	33.85	38.25	37.65	34.6	30.8
5/5/2015	26.7	25.6	25.6	33.2	37.45	33.95	29.8	33.75	38.1	37.55	34.5	30.7
5/6/2015	26.55	25.45	25.45	33	37.25	33.75	29.65	33.55	37.9	37.35	34.3	30.55
5/7/2015	26.75	25.65	25.65	33.25	37.55	34	29.9	33.8	38.2	37.6	34.55	30.75
5/8/2015	26.9	25.8	25.8	33.45	37.8	34.2	30.1	34	38.45	37.85	34.75	30.95
5/11/2015	26.75	25.65	25.65	33.3	37.6	34	29.95	33.8	38.25	37.65	34.6	30.8
5/12/2015	26.9	25.8	25.8	33.5	37.8	34.2	30.1	34	38.45	37.85	34.8	30.95
5/13/2015	27.05	25.9	25.9	33.65	38	34.35	30.25	34.15	38.65	38	34.95	31.1
5/14/2015	27.1	25.95	25.95	33.75	38.1	34.45	30.35	34.25	38.75	38.1	35.05	31.2
5/15/2015	27.1	25.95	25.95	33.75	38.1	34.45	30.35	34.25	38.75	38.1	35.05	31.2
5/18/2015	27.25	26.1	26.1	33.95	38.35	34.65	30.55	34.45	39	38.3	35.25	31.4
5/19/2015	27.25	26.1	26.1	34	38.4	34.7	30.55	34.5	39.05	38.35	35.3	31.4

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MidC HL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
5/20/2015	27.1	25.95	25.95	33.8	38.15	34.5	30.35	34.3	38.8	38.15	35.1	31.2
5/21/2015	27.2	26.05	26.05	33.9	38.3	34.6	30.45	34.4	38.95	38.25	35.2	31.3
5/22/2015	27.1	25.95	25.95	33.75	38.15	34.45	30.35	34.25	38.8	38.1	35.05	31.2
5/26/2015	26.8	25.65	25.65	33.4	37.75	34.1	30	33.9	38.4	37.7	34.7	30.9
5/27/2015	26.75	25.6	25.6	33.35	37.65	34.05	29.95	33.85	38.3	37.65	34.65	30.85
5/28/2015	26.15	25.05	25.05	32.6	36.85	33.3	29.3	33.1	37.45	36.9	33.95	30.25
5/29/2015	25.9	24.8	24.8	32.25	36.5	32.95	29	32.75	37.05	36.55	33.65	29.95
6/1/2015	25.85	24.75	24.75	32.2	36.45	32.9	28.95	32.7	37	36.5	33.6	29.9
6/2/2015	25.6	24.5	24.5	31.85	36.05	32.55	28.65	32.35	36.6	35.75	32.95	29.3
6/3/2015	25.4	24.3	24.3	31.8	36	32.5	28.45	32.1	36.35	35.35	32.6	29
6/4/2015	25.55	24.4	24.4	31.95	36.2	32.65	28.6	32.25	36.55	35.75	32.95	29.3
6/5/2015	25.45	24.3	24.3	31.85	36.1	32.55	28.5	32.15	36.4	35.65	32.85	29.2
6/8/2015	25.7	24.55	24.55	32.15	36.45	32.9	28.8	32.45	36.75	36	33.15	29.45
6/9/2015	25.65	24.55	24.55	32.2	36.5	32.95	28.85	32.5	36.8	36.05	33.2	29.45
6/10/2015	25.75	24.65	24.65	32.35	36.65	33.1	28.95	32.65	36.95	36.2	33.35	29.55
6/11/2015	25.8	24.7	24.7	32.4	36.7	33.15	29	32.7	37	36.25	33.4	29.6
6/12/2015	25.75	24.65	24.65	32.35	36.65	33.1	28.95	32.65	36.95	36.2	33.35	29.55
6/15/2015	25.9	24.75	24.75	32.5	36.85	33.25	29.1	32.8	37.15	36.35	33.5	29.7
6/16/2015	26.2	25.05	25.05	32.85	37.25	33.65	29.45	33.15	37.55	36.65	33.75	29.95
6/17/2015	26.2	25.05	25.05	32.85	37.25	33.65	29.45	33.15	37.55	36.65	33.75	29.95
6/18/2015	26.2	25.05	25.05	32.8	37.2	33.6	29.45	33.1	37.5	36.6	33.7	29.95
6/19/2015	26.25	25.1	25.1	32.85	37.25	33.65	29.5	33.15	37.55	36.65	33.75	30
6/22/2015	26.3	25.15	25.15	32.95	37.35	33.75	29.6	33.25	37.65	36.75	33.85	30.1
6/23/2015	25.75	24.65	24.65	32.7	37.05	33.5	28.8	32.35	36.65	35.95	33.1	29.45
6/24/2015	25.8	24.7	24.7	32.8	37.15	33.6	28.85	32.45	36.75	36.05	33.15	29.5
6/25/2015	25.5	24.4	24.4	32.95	37.3	33.75	28.95	32.55	36.9	36.1	33.2	29.5
6/26/2015	25.45	24.35	24.35	32.7	37	33.45	28.25	31.75	36	35.8	32.95	29.25
6/29/2015	25.5	24.4	24.4	32.65	36.95	33.4	28.05	31.5	35.7	35.35	32.55	28.9
6/30/2015	25.4	24.3	24.3	32.65	36.95	33.4	28.05	31.5	35.7	35	32.25	28.6
7/1/2015	25.3	24.2	24.2	32.5	36.75	33.25	28.05	31.5	35.7	35	32.25	28.6
7/2/2015	25.7	24.55	24.55	33	37.3	33.75	28.45	31.95	36.25	35.2	32.45	28.8
7/6/2015	25.65	24.5	24.5	32.9	37.2	33.65	28.25	31.75	36	34.75	32.05	28.45
7/7/2015	25.25	24.1	24.1	32.35	36.6	33.1	27.8	31.25	35.4	34.65	31.95	28.35
7/8/2015	25.25	24.1	24.1	32.35	36.6	33.1	27.8	31.25	35.4	34.85	32.15	28.5
7/9/2015	25.25	24.1	24.1	32.35	36.6	33.1	27.8	31.25	35.4	34.85	32.15	28.5
7/10/2015	25.25	24.1	24.1	32.35	36.6	33.1	27.8	31.25	35.4	34.85	32.15	28.5
7/13/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	34.85	32.15	28.5
7/14/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	34.85	32.15	28.5
7/15/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	34.85	32.15	28.5
7/16/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	34.85	32.15	28.5
7/17/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	35.05	32.35	28.65
7/20/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	35.05	32.35	28.65
7/21/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	35.05	32.35	28.65
7/22/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	35.05	32.35	28.65
7/23/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	35.05	32.35	28.65
7/24/2015	25	23.9	23.9	32.55	36.8	33.3	27.95	31.45	35.6	35.05	32.35	28.65
7/27/2015	24.8	23.7	23.7	32.3	36.5	33.05	27.75	31.2	35.35	34.8	32.1	28.45
7/28/2015	24.6	23.55	23.55	32.05	36.2	32.8	27.55	31	35.1	34.8	32.1	28.45
7/29/2015	24.6	23.55	23.55	32.05	36.2	32.8	27.55	31	35.1	34.8	32.1	28.45
7/30/2015	24.6	23.55	23.55	32	36.15	32.75	27.55	30.95	35.05	34.1	31.45	27.85
7/31/2015	24.45	23.4	23.4	31.85	35.95	32.6	27.4	30.8	34.85	34.1	31.45	27.85
8/3/2015	24.45	23.4	23.4	31.85	35.95	32.6	27.4	30.8	34.85	34.35	31.7	28.05
8/4/2015	24.4	23.35	23.35	31.75	35.85	32.5	27.3	30.7	34.75	34.35	31.7	28.05
8/5/2015	24.4	23.35	23.35	31.6	35.65	32.3	27.3	30.7	34.75	34.1	31.45	27.85

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MidC HL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
8/6/2015	24.4	23.35	23.35	31.6	35.65	32.3	27.3	30.7	34.75	34.1	31.45	27.85
8/7/2015	24.45	23.4	23.4	31.65	35.7	32.35	27.35	30.75	34.8	34.1	31.45	27.85
8/10/2015	24.5	23.45	23.45	31.75	35.8	32.45	27.65	31.1	35.15	34.1	31.45	27.85
8/11/2015	24.5	23.45	23.45	31.75	35.8	32.45	27.65	31.1	35.15	34.1	31.45	27.85
8/12/2015	24.5	23.45	23.45	31.75	35.8	32.45	27.65	31.1	35.15	34.1	31.45	27.85
8/13/2015	24.5	23.45	23.45	31.75	35.8	32.45	27.65	31.1	35.15	34.1	31.45	27.85
8/14/2015	24.5	23.45	23.45	31.75	35.8	32.45	27.65	31.1	35.15	34.1	31.45	27.85
8/17/2015	24.45	23.4	23.4	31.6	35.65	32.3	27.65	31.1	35.15	34.1	31.45	27.85
8/18/2015	24.45	23.4	23.4	31.6	35.65	32.3	27.65	31.1	35.15	34.1	31.45	27.85
8/19/2015	24.35	23.3	23.3	31.5	35.55	32.2	27.55	31	35.05	34.1	31.45	27.85
8/20/2015	24.35	23.3	23.3	31.5	35.55	32.2	27.55	31	35.05	34.1	31.45	27.85
8/21/2015	24.35	23.3	23.3	31.5	35.55	32.2	27.55	31	35.05	34.1	31.45	27.85
8/24/2015	24.35	23.3	23.3	30.3	34.2	31	27.55	31	35.05	33.75	31.1	27.55
8/25/2015	24.4	23.35	23.35	30.35	34.25	31.05	27.6	31.05	35.1	33.7	31.05	27.5
8/26/2015	24.4	23.35	23.35	30.35	34.25	31.05	27.6	31.05	35.1	33.7	31.05	27.5
8/27/2015	24.4	23.35	23.35	30.35	34.25	31.05	27.6	31.05	35.1	33.7	31.05	27.5
8/28/2015	24.4	23.35	23.35	30.35	34.25	31.05	27.6	31.05	35.1	33.75	31.1	27.55
8/31/2015	24.4	23.35	23.35	30.35	34.25	31.05	27.6	31.05	35.1	33.75	31.1	27.55
9/1/2015	24.2	23.15	23.15	30.15	34.05	30.85	27.2	30.6	34.6	33.2	30.6	27.1
9/2/2015	23.95	22.9	22.9	30.05	33.9	30.75	27.1	30.5	34.45	33.2	30.6	27.1
9/3/2015	23.95	22.9	22.9	30.05	33.9	30.75	27.1	30.5	34.45	33.2	30.6	27.1
9/4/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.2	30.6	27.1
9/8/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.2	30.6	27.1
9/9/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.2	30.6	27.1
9/10/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.2	30.6	27.1
9/11/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.2	30.6	27.1
9/14/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.2	30.6	27.1
9/15/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.3	30.7	27.2
9/16/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.3	30.7	27.2
9/17/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.3	30.7	27.2
9/18/2015	24.05	23	23	30.15	34	30.85	27.2	30.6	34.55	33.3	30.7	27.2
9/21/2015	24.05	23	23	29.95	33.75	30.65	27.2	30.6	34.55	33.3	30.7	27.2
9/22/2015	23.95	22.9	22.9	29.95	33.75	30.65	27.2	30.6	34.55	33.3	30.7	27.2
9/23/2015	23.7	22.65	22.65	29.95	33.75	30.65	27.2	30.6	34.55	33.3	30.7	27.2
9/24/2015	23.7	22.65	22.65	29.95	33.75	30.65	27.2	30.6	34.55	33.3	30.7	27.2
9/25/2015	23.45	22.4	22.4	29.7	33.45	30.4	27	30.35	34.3	33.3	30.7	27.2
9/28/2015	23.45	22.4	22.4	29.6	33.35	30.3	26.45	29.75	33.6	33.3	30.7	27.2
9/29/2015	23.2	22.2	22.2	28.95	32.6	29.65	26.15	29.4	33.2	32.8	30.25	26.8
9/30/2015	23.2	22.2	22.2	28.95	32.6	29.65	26.15	29.4	33.2	32.3	29.8	26.4
Average HL	26.92	25.96	25.33	35.15	38.33	36.24	33.06	35.64	38.64	38.05	36.60	32.99
Max HL	32.68	31.83	30.05	44.44	46.27	46.32	44.07	45.28	46.50	45.98	46.72	42.83
Min HL	23.20	22.20	22.20	28.95	32.60	29.65	26.15	29.40	33.20	32.30	29.80	26.40
Spread	9.48	9.63	7.85	15.49	13.67	16.67	17.92	15.88	13.30	13.68	16.92	16.43

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MidC LL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
9/30/2014	20.7859	16.5751	15.2213	29.8652	33.0051	33.4703	37.108	36.9816	37.8349	38.8127	38.1216	36.3584
10/1/2014	20.6918	16.5001	15.1524	29.73	32.8557	33.3188	36.94	36.8142	37.6637	38.6519	37.9637	36.2078
10/2/2014	20.5635	16.3978	15.0584	29.5457	32.6519	33.1122	36.7109	36.5859	37.4301	38.4327	37.7484	36.0024
10/3/2014	21.0169	16.7593	15.3904	30.1971	33.3718	33.8422	37.5203	37.3925	38.2553	38.7834	38.0929	36.331
10/6/2014	20.8543	16.6297	15.2714	29.9635	33.1137	33.5805	37.2301	37.1034	37.9595	38.5058	37.8202	36.0709
10/7/2014	20.8543	16.6297	15.2714	29.9635	33.1137	33.5805	37.2301	37.1034	37.9595	38.5058	37.8202	36.0709
10/8/2014	20.8201	16.6024	15.2463	29.9144	33.0594	33.5254	37.169	37.0425	37.8972	38.4473	37.7628	36.0161
10/9/2014	20.8201	16.6024	15.2463	29.9144	33.0594	33.5254	37.169	37.0425	37.8972	38.4473	37.7628	36.0161
10/10/2014	20.8885	16.657	15.2964	30.0127	33.1681	33.6356	37.2912	37.1642	38.0218	38.5642	37.8776	36.1256
10/13/2014	20.8885	16.657	15.2964	30.0127	33.1681	33.6356	37.2912	37.1642	38.0218	38.5642	37.8776	36.1256
10/14/2014	20.6832	16.4933	15.1461	29.7177	32.8421	33.3051	36.9247	36.799	37.6481	38.2135	37.5332	35.7971
10/15/2014	20.3411	16.2205	14.8956	29.2261	32.2988	32.7541	36.3139	36.1902	37.0253	37.629	36.959	35.2495
10/16/2014	20.247	16.1454	14.8267	29.0909	32.1494	32.6026	36.1459	36.0228	36.854	37.4682	36.8011	35.099
10/17/2014	20.247	16.1454	14.8267	29.0909	32.1494	32.6026	36.1459	36.0228	36.854	37.4682	36.8011	35.099
10/20/2014	19.9048	15.8726	14.5761	28.5993	31.6061	32.0516	35.5351	35.4141	36.2312	36.8837	36.227	34.5514
10/21/2014	19.8364	15.818	14.526	28.501	31.4974	31.9415	35.4129	35.2923	36.1067	36.7668	36.1122	34.4419
10/22/2014	19.7081	15.7157	14.432	28.3167	31.2937	31.7348	35.1838	35.064	35.8731	36.5476	35.8969	34.2365
10/23/2014	19.614	15.6407	14.3631	28.1815	31.1443	31.5833	35.0159	34.8966	35.7019	36.3869	35.739	34.086
10/24/2014	19.614	15.6407	14.3631	28.1815	31.1443	31.5833	35.0159	34.8966	35.7019	36.3869	35.739	34.086
10/27/2014	19.614	15.6407	14.3631	28.1815	31.1443	31.5833	35.0159	34.8966	35.7019	36.3869	35.739	34.086
10/28/2014	19.614	15.6407	14.3631	28.1815	31.1443	31.5833	35.0159	34.8966	35.7019	36.3869	35.739	34.086
10/29/2014	19.614	15.6407	14.3631	28.1815	31.1443	31.5833	35.0159	34.8966	35.7019	36.3869	35.739	34.086
10/30/2014	19.9562	15.9135	14.6137	28.6731	31.6876	32.1343	35.6267	35.5054	36.3247	37.5998	36.9303	35.2222
10/31/2014	19.9904	15.9408	14.6387	28.7222	31.7419	32.1894	35.6878	35.5663	36.3869	37.6582	36.9877	35.2769
11/3/2014	20.0845	16.0158	14.7076	28.8574	31.8913	32.3409	35.8558	35.7337	36.5582	37.819	37.1456	35.4275
11/4/2014	20.1529	16.0704	14.7577	28.9557	32	32.4511	35.9779	35.8554	36.6828	37.9359	37.2604	35.537
11/5/2014	20.247	16.1454	14.8267	29.0909	32.1494	32.6026	36.1459	36.0228	36.854	38.0966	37.4183	35.6876
11/6/2014	20.5464	16.3842	15.0459	29.5211	32.6248	33.0847	36.6804	36.5555	37.399	38.6081	37.9207	36.1667
11/7/2014	20.5464	16.3842	15.0459	29.5211	32.6248	33.0847	36.6804	36.5555	37.399	38.6081	37.9207	36.1667
11/10/2014	20.478	16.3296	14.9958	29.4228	32.5161	32.9745	36.5582	36.4337	37.2744	38.4912	37.8059	36.0572
11/11/2014	20.0246	15.9681	14.6638	28.7714	31.7962	32.2445	35.7489	35.6271	36.4492	37.7167	37.0451	35.3317
11/12/2014	19.9647	15.9203	14.6199	28.6854	31.7012	32.1481	35.642	35.5206	36.3402	37.6144	36.9447	35.2358
11/13/2014	19.6226	15.6475	14.3694	28.1938	31.1579	31.5971	35.0311	34.9119	35.7174	37.0298	36.3706	34.6883
11/14/2014	19.6568	15.6748	14.3944	28.2429	31.2122	31.6522	35.0922	34.9727	35.7797	37.0883	36.428	34.743
11/17/2014	19.691	15.7021	14.4195	28.2921	31.2665	31.7073	35.1533	35.0336	35.842	37.1468	36.4854	34.7978
11/18/2014	19.5798	15.6134	14.3381	28.1323	31.09	31.5282	34.9548	34.8358	35.6396	36.9568	36.2988	34.6198
11/19/2014	19.3488	15.4292	14.1689	27.8005	30.7232	31.1563	34.5425	34.4249	35.2192	36.5622	35.9113	34.2502
11/20/2014	19.2205	15.3269	14.075	27.6161	30.5195	30.9497	34.3134	34.1966	34.9856	36.343	35.696	34.0449
11/21/2014	19.1607	15.2791	14.0311	27.5301	30.4244	30.8533	34.2065	34.09	34.8767	36.2407	35.5955	33.9491
11/24/2014	19.1607	15.2791	14.0311	27.5301	30.4244	30.8533	34.2065	34.09	34.8767	36.2407	35.5955	33.9491
11/25/2014	18.8784	15.0541	13.8244	27.1245	29.9762	30.3988	33.7026	33.5878	34.3628	35.3493	34.72	33.114
11/26/2014	18.9383	15.1018	13.8683	27.2105	30.0713	30.4952	33.8095	33.6943	34.4718	35.4516	34.8204	33.2099
11/27/2014	18.9383	15.1018	13.8683	27.2105	30.0713	30.4952	33.8095	33.6943	34.4718	35.4516	34.8204	33.2099
11/28/2014	18.9383	15.1018	13.8683	27.2105	30.0713	30.4952	33.8095	33.6943	34.4718	35.4516	34.8204	33.2099
12/1/2014	18.9383	15.1018	13.8683	27.2105	30.0713	30.4952	33.8095	33.6943	34.4718	35.4516	34.8204	33.2099
12/2/2014	18.9212	15.0882	13.8557	27.186	30.0441	30.4677	33.7789	33.6639	34.4407	35.2909	34.6625	33.0593
12/3/2014	18.7586	14.9586	13.7367	26.9524	29.7861	30.206	33.4888	33.3748	34.1449	35.0132	34.3898	32.7992
12/4/2014	18.5106	14.7607	13.5551	26.596	29.3922	29.8065	33.0459	32.9334	33.6933	34.6041	33.988	32.4159
12/5/2014	18.5106	14.7607	13.5551	26.596	29.3922	29.8065	33.0459	32.9334	33.6933	34.6041	33.988	32.4159
12/8/2014	18.1684	14.4879	13.3045	26.1044	28.8489	29.2556	32.4351	32.3247	33.0705	33.9903	33.3851	31.8409
12/9/2014	18.2625	14.5629	13.3734	26.2396	28.9983	29.4071	32.6031	32.4921	33.2418	34.151	33.543	31.9915
12/10/2014	18.348	14.6311	13.4361	26.3625	29.1341	29.5448	32.7558	32.6443	33.3975	34.2826	33.6722	32.1147
12/11/2014	18.348	14.6311	13.4361	26.3625	29.1341	29.5448	32.7558	32.6443	33.3975	34.2826	33.6722	32.1147
12/12/2014	18.6218	14.8494	13.6365	26.7558	29.5687	29.9856	33.2445	33.1313	33.8957	34.4433	33.8301	32.2653

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MidC LL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
12/15/2014	18.6988	14.9108	13.6929	26.8664	29.691	30.1095	33.3819	33.2682	34.0359	34.5748	33.9593	32.3885
12/16/2014	18.9126	15.0813	13.8495	27.1737	30.0305	30.4539	33.7637	33.6487	34.4251	34.5748	33.9593	32.3885
12/17/2014	18.9468	15.1086	13.8745	27.2228	30.0849	30.509	33.8248	33.7096	34.4874	34.6333	34.0167	32.4433
12/18/2014	18.9468	15.1086	13.8745	27.2228	30.0849	30.509	33.8248	33.7096	34.4874	34.6333	34.0167	32.4433
12/19/2014	18.9383	15.1018	13.8683	27.2105	30.0713	30.4952	33.8095	33.6943	34.4718	34.6333	34.0167	32.4433
12/22/2014	18.4764	14.7335	13.53	26.5469	29.3378	29.7514	32.9849	32.8725	33.6311	33.8296	33.2272	31.6904
12/23/2014	18.4935	14.7471	13.5426	26.5714	29.365	29.779	33.0154	32.903	33.6622	33.8734	33.2703	31.7314
12/24/2014	18.4935	14.7471	13.5426	26.5714	29.365	29.779	33.0154	32.903	33.6622	33.8734	33.2703	31.7314
12/26/2014	18.4079	14.6789	13.4799	26.4485	29.2292	29.6412	32.8627	32.7508	33.5065	33.7126	33.1124	31.5808
12/29/2014	18.4079	14.6789	13.4799	26.4485	29.2292	29.6412	32.8627	32.7508	33.5065	33.7126	33.1124	31.5808
12/30/2014	18.2996	14.5925	13.4006	26.2929	29.0571	29.4668	32.6693	32.558	33.3093	33.5519	32.9545	31.4303
12/31/2014	18.0857	14.422	13.244	25.9856	28.7176	29.1224	32.2875	32.1775	32.92	32.5144	31.9355	30.4583
1/2/2015	18.0857	14.422	13.244	25.9856	28.7176	29.1224	32.2875	32.1775	32.92	32.5144	31.9355	30.4583
1/5/2015	17.9574	14.3197	13.15	25.8013	28.5138	28.9158	32.0584	31.9493	32.6865	32.2806	31.7058	30.2393
1/6/2015	17.7436	14.1491	12.9934	25.494	28.1743	28.5715	31.6767	31.5688	32.2972	31.9152	31.347	29.8971
1/7/2015	17.5896	14.0263	12.8807	25.2728	27.9298	28.3235	31.4018	31.2949	32.017	31.7545	31.1891	29.7465
1/8/2015	17.3415	13.8285	12.699	24.9164	27.5359	27.9241	30.9589	30.8535	31.5654	31.3161	30.7585	29.3358
1/9/2015	17.2817	13.7808	12.6552	24.8303	27.4408	27.8277	30.852	30.747	31.4565	31.2138	30.6581	29.24
1/12/2015	17.1876	13.7058	12.5863	24.6951	27.2914	27.6762	30.6841	30.5796	31.2852	31.053	30.5002	29.0894
1/13/2015	16.9737	13.5352	12.4297	24.3879	26.9519	27.3318	30.3023	30.1991	30.8959	30.4393	29.8973	28.5145
1/14/2015	16.9395	13.5079	12.4046	24.3387	26.8975	27.2767	30.2412	30.1382	30.8337	30.3808	29.8399	28.4597
1/15/2015	16.9395	13.5079	12.4046	24.3387	26.8975	27.2767	30.2412	30.1382	30.8337	30.3808	29.8399	28.4597
1/16/2015	16.9395	13.5079	12.4046	24.3387	26.8975	27.2767	30.2412	30.1382	30.8337	30.3808	29.8399	28.4597
1/20/2015	16.9253	13.4966	12.3942	24.3182	26.8749	27.2538	30.2158	30.1129	30.8077	30.3516	29.8112	28.4323
1/21/2015	16.3464	13.035	11.9703	23.4866	25.9558	26.3217	29.1824	29.0831	29.7541	28.3691	27.864	26.5752
1/22/2015	16.3236	13.0168	11.9536	23.4538	25.9196	26.285	29.1417	29.0425	29.7126	28.335	27.8305	26.5432
1/23/2015	16.3236	13.0168	11.9536	23.4538	25.9196	26.285	29.1417	29.0425	29.7126	28.335	27.8305	26.5432
1/26/2015	16.3236	13.0168	11.9536	23.4538	25.9196	26.285	29.1417	29.0425	29.7126	28.335	27.8305	26.5432
1/27/2015	16.3807	13.0623	11.9954	23.5358	26.0102	26.3768	29.2435	29.1439	29.8164	28.4275	27.9214	26.6299
1/28/2015	16.3807	13.0623	11.9954	23.5358	26.0102	26.3768	29.2435	29.1439	29.8164	28.4275	27.9214	26.6299
1/29/2015	16.124	12.8577	11.8075	23.1671	25.6027	25.9636	28.7854	28.6874	29.3493	27.9891	27.4908	26.2193
1/30/2015	16.124	12.8577	11.8075	23.1671	25.6027	25.9636	28.7854	28.6874	29.3493	27.9891	27.4908	26.2193
2/2/2015	15.9587	12.7258	11.6863	22.9294	25.3401	25.6973	28.4902	28.3931	29.0483	27.7018	27.2085	25.95
2/3/2015	15.9929	12.7531	11.7114	22.9786	25.3944	25.7524	28.5512	28.454	29.1106	27.7602	27.266	26.0048
2/4/2015	15.7961	12.5962	11.5673	22.6959	25.082	25.4356	28.2	28.104	28.7525	27.429	26.9406	25.6945
2/5/2015	15.7933	12.5939	11.5652	22.6918	25.0775	25.431	28.1949	28.0989	28.7473	27.4192	26.9311	25.6854
2/6/2015	15.7591	12.5666	11.5402	22.6427	25.0232	25.3759	28.1338	28.038	28.685	27.3608	26.8736	25.6306
2/9/2015	15.7591	12.5666	11.5402	22.6427	25.0232	25.3759	28.1338	28.038	28.685	27.3608	26.8736	25.6306
2/10/2015	15.7591	12.5666	11.5402	22.6427	25.0232	25.3759	28.1338	28.038	28.685	27.3608	26.8736	25.6306
2/11/2015	15.7933	12.5939	11.5652	22.6918	25.0775	25.431	28.1949	28.0989	28.7473	27.4192	26.9311	25.6854
2/12/2015	15.7591	12.5666	11.5402	22.6427	25.0232	25.3759	28.1338	28.038	28.685	27.3608	26.8736	25.6306
2/13/2015	16.4981	13.156	12.0814	23.7046	26.1967	26.566	29.4532	29.3529	30.0303	28.9556	28.44	27.1246
2/17/2015	16.3864	13.0669	11.9995	23.544	26.0192	26.386	29.2537	29.1541	29.8268	28.7783	28.2659	26.9585
2/18/2015	16.5774	13.2192	12.1394	23.8184	26.3226	26.6936	29.5947	29.494	30.1745	29.1046	28.5864	27.2642
2/19/2015	16.8939	13.4716	12.3712	24.2732	26.8251	27.2033	30.1598	30.0571	30.7506	29.6404	29.1127	27.7661
2/20/2015	16.8768	13.4579	12.3587	24.2486	26.7979	27.1757	30.1292	30.0266	30.7195	29.6112	29.084	27.7388
2/23/2015	16.8768	13.4579	12.3587	24.2486	26.7979	27.1757	30.1292	30.0266	30.7195	29.6112	29.084	27.7388
2/24/2015	16.8768	13.4579	12.3587	24.2486	26.7979	27.1757	30.1292	30.0266	30.7195	29.6112	29.084	27.7388
2/25/2015	20.25	16.2	14.5	19.35	25.5	24.25	28	31.3	34.9	31.4	29.5	26.25
2/26/2015	20.2	16.15	14.45	19.3	25.4	24.2	27.95	31.25	34.8	31.35	29.45	26.2
2/27/2015	20.1	16.05	14.35	19.15	25.25	24.05	27.85	31.1	34.65	31.2	29.3	26.1
3/2/2015	20	15.95	14.25	19.05	25.15	23.95	27.75	31	34.55	31.1	29.2	26
3/3/2015	20	15.95	14.25	19.05	25.15	23.95	27.75	31	34.55	31.1	29.2	26
3/4/2015	20.2	16.15	14.45	19.3	25.45	24.2	28	31.25	34.85	31.35	29.45	26.2

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MidC LL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
3/5/2015	20	16.2	14.5	19.35	25.5	24.25	28.05	31.3	34.9	31.4	29.5	26.25
3/6/2015	19.8	16	14.3	19.1	25.2	24	27.8	31.05	34.6	31.15	29.25	26.05
3/9/2015	19.65	15.85	14.15	18.9	25	23.8	27.65	30.85	34.4	30.95	29.1	25.9
3/10/2015	19.65	15.85	14.15	18.9	25	23.8	27.65	30.85	34.4	30.95	29.1	25.9
3/11/2015	19.9	16.1	14.4	19.2	25.35	24.1	27.95	31.15	34.75	31.3	29.4	26.15
3/12/2015	19.9	16.1	14.4	19.2	25.35	24.1	27.95	31.15	34.75	31.3	29.4	26.15
3/13/2015	19.95	16.15	14.45	19.3	25.45	24.2	28	31.25	34.85	31.4	29.45	26.2
3/16/2015	20.1	16.3	14.6	19.45	25.65	24.35	28.15	31.45	35.05	31.6	29.6	26.35
3/17/2015	20.1	16.3	14.6	19.5	25.7	24.4	28.15	31.5	35.1	31.65	29.6	26.35
3/18/2015	19.95	16.15	14.45	19.3	25.45	24.2	27.95	31.25	34.85	31.4	29.4	26.15
3/19/2015	19.7	15.9	14.2	19	25.1	23.9	27.65	30.95	34.5	31.1	29.1	25.9
3/20/2015	20.05	16.25	14.55	19.45	25.6	24.35	28.05	31.4	35	31.55	29.5	26.3
3/23/2015	20.05	16.25	14.55	19.45	25.6	24.35	28.05	31.4	35	31.55	29.5	26.3
3/24/2015	20.2	16.4	14.7	19.65	25.85	24.55	28.25	31.6	35.25	31.75	29.7	26.45
3/25/2015	20.15	16.35	14.65	19.6	25.8	24.5	28.2	31.55	35.2	31.7	29.65	26.4
3/26/2015	19.75	15.95	14.25	19.1	25.25	24	27.75	31.05	34.6	31.15	29.15	25.95
3/27/2015	19.6	15.8	14.1	18.9	25.05	23.8	27.6	30.85	34.4	30.95	28.95	25.8
3/30/2015	19.6	15.8	14.1	18.9	25	23.8	27.6	30.85	34.35	30.9	28.95	25.8
3/31/2015	19.55	15.75	14.05	18.85	24.95	23.75	27.55	30.8	34.3	30.85	28.9	25.75
4/1/2015	19.4	15.6	13.9	18.65	24.7	23.55	27.35	30.6	34.05	30.65	28.7	25.6
4/2/2015	19.45	15.65	13.95	18.7	24.8	23.65	27.4	30.7	34.15	30.75	28.75	25.65
4/3/2015	19.45	15.65	13.95	18.7	24.8	23.65	27.4	30.7	34.15	30.75	28.75	25.65
4/6/2015	19.3	15.5	13.8	18.55	24.6	23.5	27.25	30.5	33.95	30.55	28.6	25.5
4/7/2015	19.3	15.5	13.8	18.55	24.55	23.5	27.25	30.5	33.9	30.55	28.6	25.5
4/8/2015	19.15	15.4	13.7	18.4	24.35	23.35	27.1	30.35	33.7	30.4	28.45	25.35
4/9/2015	18.85	15.1	13.4	18.05	23.95	22.95	26.75	29.95	33.25	30	28.1	25.05
4/10/2015	18.9	15.15	13.45	18.1	24	23	26.8	30	33.3	30.05	28.15	25.1
4/13/2015	18.55	14.85	13.15	17.7	23.5	22.55	26.4	29.55	32.8	29.6	27.75	24.75
4/14/2015	18.65	14.95	13.25	17.85	23.65	22.7	26.5	29.7	32.95	29.75	27.85	24.85
4/15/2015	18.7	15	13.3	17.9	23.75	22.75	26.55	29.75	33.05	29.8	27.9	24.9
4/16/2015	18.75	15.05	13.35	17.95	23.8	22.8	26.6	29.8	33.1	29.85	27.95	24.95
4/17/2015	18.75	15.05	13.35	17.95	23.8	22.8	26.6	29.8	33.1	29.85	27.95	24.95
4/20/2015	18.65	14.95	13.25	17.85	23.65	22.7	26.5	29.7	32.95	29.75	27.85	24.85
4/21/2015	18.8	15.1	13.4	17.4	23.15	22.25	26.65	29.9	33.15	29.75	27.85	24.85
4/22/2015	18.95	15.25	13.55	17.55	23.35	22.45	26.8	30.1	33.35	29.95	28	25
4/23/2015	18.95	15.25	13.55	17.55	23.35	22.45	26.8	30.1	33.35	29.95	28	25
4/24/2015	19.1	15.4	13.7	17.75	23.55	22.65	27	30.3	33.6	30.15	28.2	25.15
4/27/2015	19.1	15.4	13.7	17.75	23.55	22.65	27	30.3	33.6	30.15	28.2	25.15
4/28/2015	19.2	15.5	13.8	17.85	23.65	22.75	27.1	30.4	33.7	30.25	28.3	25.25
4/29/2015	19.6	15.85	14.15	18.3	24.2	23.25	27.55	30.9	34.25	30.75	28.75	25.65
4/30/2015	19.7	15.95	14.25	18.45	24.35	23.4	27.7	31.05	34.4	30.9	28.9	25.75
5/1/2015	19.7	15.95	14.25	18.45	24.35	23.4	26.2	29.8	33.15	30.55	28.6	25.45
5/4/2015	19.8	16.05	14.35	18.6	24.5	23.55	26.35	29.95	33.3	30.7	28.75	25.6
5/5/2015	19.7	15.95	14.25	18.5	24.35	23.45	26.25	29.85	33.15	30.6	28.65	25.5
5/6/2015	19.55	15.8	14.1	18.3	24.15	23.25	26.1	29.65	32.95	30.4	28.45	25.35
5/7/2015	19.75	16	14.3	18.55	24.45	23.5	26.35	29.9	33.25	30.65	28.7	25.55
5/8/2015	19.9	16.15	14.45	18.75	24.7	23.7	26.55	30.1	33.5	30.9	28.9	25.75
5/11/2015	19.75	16	14.3	18.6	24.5	23.5	26.4	29.9	33.3	30.7	28.75	25.6
5/12/2015	19.9	16.15	14.45	18.8	24.7	23.7	26.55	30.1	33.5	30.9	28.95	25.75
5/13/2015	20.05	16.25	14.55	18.95	24.9	23.85	26.7	30.25	33.7	31.05	29.1	25.9
5/14/2015	20.1	16.3	14.6	19.05	25	23.95	26.8	30.35	33.8	31.15	29.2	26
5/15/2015	20.1	16.3	14.6	19.05	25	23.95	26.8	30.35	33.8	31.15	29.2	26
5/18/2015	20.25	16.45	14.75	19.25	25.25	24.15	27	30.55	34.05	31.35	29.4	26.2
5/19/2015	20.25	16.45	14.75	19.3	25.3	24.2	27	30.6	34.1	31.4	29.45	26.2

Mid-Columbia Heavy Load and Light Load Daily Forward Curves
 April 2016 - March 2017

Idaho Power/102
 Noe/9

MidC LL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
5/20/2015	20.1	16.3	14.6	19.1	25.05	24	26.8	30.4	33.85	31.2	29.25	26
5/21/2015	20.2	16.4	14.7	19.2	25.2	24.1	26.9	30.5	34	31.3	29.35	26.1
5/22/2015	20.1	16.3	14.6	19.05	25.05	23.95	26.8	30.35	33.85	31.15	29.2	26
5/26/2015	19.8	16	14.3	18.7	24.65	23.6	26.45	30	33.45	30.75	28.85	25.7
5/27/2015	19.75	15.95	14.25	18.65	24.55	23.55	26.4	29.95	33.35	30.7	28.8	25.65
5/28/2015	19.15	15.4	13.7	17.9	23.75	22.8	25.75	29.2	32.5	29.95	28.1	25.05
5/29/2015	18.9	15.15	13.45	17.55	23.4	22.45	25.45	28.85	32.1	29.6	27.8	24.75
6/1/2015	18.85	15.1	13.4	17.5	23.35	22.4	25.4	28.8	32.05	29.55	27.75	24.7
6/2/2015	18.9	15.1	13.35	17.45	23.4	22.45	25.55	28.95	32.25	30.15	28.35	25.2
6/3/2015	19.25	15.35	13.55	17.9	24.05	23.05	26.1	29.55	32.9	30.85	29	25.8
6/4/2015	19.4	15.45	13.65	18.05	24.25	23.2	26.25	29.7	33.1	31.25	29.35	26.1
6/5/2015	19.3	15.35	13.55	17.95	24.15	23.1	26.15	29.6	32.95	31.15	29.25	26
6/8/2015	19.55	15.6	13.8	18.25	24.5	23.45	26.45	29.9	33.3	31.5	29.55	26.25
6/9/2015	19.5	15.6	13.8	18.3	24.55	23.5	26.5	29.95	33.35	31.55	29.6	26.25
6/10/2015	19.6	15.7	13.9	18.45	24.7	23.65	26.6	30.1	33.5	31.7	29.75	26.35
6/11/2015	19.65	15.75	13.95	18.5	24.75	23.7	26.65	30.15	33.55	31.75	29.8	26.4
6/12/2015	19.6	15.7	13.9	18.45	24.7	23.65	26.6	30.1	33.5	31.7	29.75	26.35
6/15/2015	19.75	15.8	14	18.6	24.9	23.8	26.75	30.25	33.7	31.85	29.9	26.5
6/16/2015	20.05	16.1	14.3	18.95	25.3	24.2	27.1	30.6	34.1	32.15	30.15	26.75
6/17/2015	20.05	16.1	14.3	18.95	25.3	24.2	27.1	30.6	34.1	32.15	30.15	26.75
6/18/2015	20.05	16.1	14.3	18.9	25.25	24.15	27.1	30.55	34.05	32.1	30.1	26.75
6/19/2015	20.1	16.15	14.35	18.95	25.3	24.2	27.15	30.6	34.1	32.15	30.15	26.8
6/22/2015	20.15	16.2	14.4	19.05	25.4	24.3	27.25	30.7	34.2	32.25	30.25	26.9
6/23/2015	19.6	15.7	13.9	18.8	25.1	24.05	26.45	29.8	33.2	31.45	29.5	26.25
6/24/2015	19.65	15.75	13.95	18.9	25.2	24.15	26.5	29.9	33.3	31.55	29.55	26.3
6/25/2015	19.35	15.45	13.65	19.05	25.35	24.3	26.6	30	33.45	31.6	29.6	26.3
6/26/2015	19.3	15.4	13.6	19	25.3	24.3	26.45	26.45	29.45	31.3	29.35	26.05
6/29/2015	19.35	15.45	13.65	19.75	26.3	25.25	23.25	26.2	29.15	30.85	28.95	25.7
6/30/2015	19.25	15.35	13.55	19.75	26.3	25.25	23.25	26.2	29.15	30.5	28.65	25.4
7/1/2015	19.15	15.25	13.45	19.6	26.1	25.1	23.25	26.2	29.15	30.5	28.65	25.4
7/2/2015	19.55	15.6	13.8	20.1	26.65	25.6	23.65	26.65	29.7	30.7	28.85	25.6
7/6/2015	19.5	15.55	13.75	19.9	26.4	25.35	23.45	26.45	29.45	30.25	28.45	25.25
7/7/2015	19.1	15.15	13.35	19.35	25.8	24.8	23	25.95	28.85	30.15	28.35	25.15
7/8/2015	19.1	15.15	13.35	19.35	25.8	24.8	23	25.95	28.85	30.35	28.55	25.3
7/9/2015	19.1	15.15	13.35	19.35	25.8	24.8	23	25.95	28.85	30.35	28.55	25.3
7/10/2015	19.1	15.15	13.35	19.35	25.8	24.8	23	25.95	28.85	30.35	28.55	25.3
7/13/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.35	28.55	25.3
7/14/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.35	28.55	25.3
7/15/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.35	28.55	25.3
7/16/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.35	28.55	25.3
7/17/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.55	28.75	25.45
7/20/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.55	28.75	25.45
7/21/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.55	28.75	25.45
7/22/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.55	28.75	25.45
7/23/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.55	28.75	25.45
7/24/2015	18.85	14.95	13.15	19.55	26	25	23.15	26.15	29.05	30.55	28.75	25.45
7/27/2015	18.65	14.75	12.95	19.3	25.7	24.75	22.95	25.9	28.8	30.3	28.5	25.25
7/28/2015	19	15	13.15	19.05	25.4	24.5	22.75	25.7	28.55	30.3	28.5	25.25
7/29/2015	19	15	13.15	19.05	25.4	24.5	22.75	25.7	28.55	30.3	28.5	25.25
7/30/2015	19.2	15.15	13.25	19	25.35	24.45	22.75	25.65	28.5	29.6	27.85	24.65
7/31/2015	19.05	15	13.1	18.85	25.15	24.3	22.6	25.5	28.3	29.6	27.85	24.65
8/3/2015	19.05	15	13.1	18.85	25.15	24.3	22.6	25.5	28.3	29.85	28.1	24.85
8/4/2015	20	15.7	13.7	19.75	26.35	25.5	23.7	26.75	29.7	29.85	28.1	24.85
8/5/2015	20	15.7	13.7	19.6	26.15	25.3	23.7	26.75	29.7	29.6	27.85	24.65

Mid-Columbia Heavy Load and Light Load Daily Forward Curves
 April 2016 - March 2017

Idaho Power/102
 Noe/10

MidC LL	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
8/6/2015	20	15.7	13.7	19.6	26.15	25.3	23.7	26.75	29.7	29.6	27.85	24.65
8/7/2015	20.1	15.75	13.75	19.7	26.25	25.4	23.8	26.85	29.8	29.6	27.85	24.65
8/10/2015	20.1	15.75	13.75	19.7	26.25	25.4	24	27.05	30.05	30.7	28.85	25.55
8/11/2015	20.1	15.75	13.75	19.7	26.25	25.4	24	27.05	30.05	30.7	28.85	25.55
8/12/2015	20.1	15.75	13.75	19.7	26.25	25.4	24	27.05	30.05	30.7	28.85	25.55
8/13/2015	20.1	15.75	13.75	19.7	26.25	25.4	24	27.05	30.05	30.7	28.85	25.55
8/14/2015	19.95	15.6	13.65	19.55	26	25.2	23.8	26.8	29.8	30.45	28.6	25.35
8/17/2015	19.9	15.55	13.6	19.4	25.85	25.05	23.65	26.65	29.45	30	28.15	25
8/18/2015	19.85	15.5	13.6	19.35	25.75	25	23.6	26.6	29.4	29.85	28	24.9
8/19/2015	19.75	15.4	13.5	19.25	25.65	24.9	23.5	26.5	29.3	29.85	28	24.9
8/20/2015	19.75	15.4	13.5	19.25	25.65	24.9	23.5	26.5	29.3	29.85	28	24.9
8/21/2015	19.75	15.4	13.5	19.25	25.65	24.9	23.5	26.5	29.3	29.85	28	24.9
8/24/2015	19.75	15.4	13.5	18.05	24.3	23.7	23.5	26.5	29.3	29.5	27.65	24.6
8/25/2015	19.75	15.4	13.5	18.05	24.3	23.7	23.5	26.5	29.3	29.25	27.4	24.4
8/26/2015	19.75	15.4	13.5	18.05	24.3	23.7	23.5	26.5	29.3	29.25	27.4	24.4
8/27/2015	19.75	15.4	13.5	18.05	24.3	23.7	23.5	26.5	29.3	29.25	27.4	24.4
8/28/2015	19.75	15.4	13.5	18.05	24.3	23.7	23.5	26.5	29.3	29.3	27.45	24.45
8/31/2015	19.75	15.4	13.5	18.05	24.3	23.7	23.5	26.5	29.3	29.3	27.45	24.45
9/1/2015	19	14.75	12.95	17.85	24.1	23.5	23.1	26.05	28.8	28.75	26.95	24
9/2/2015	18.75	14.5	12.7	17.75	23.95	23.4	23	25.95	28.65	28.75	26.95	24
9/3/2015	18.75	14.5	12.7	17.75	23.95	23.4	23	25.95	28.65	28.75	26.95	24
9/4/2015	18.65	14.45	12.65	17.85	24.05	23.5	23.1	26.05	28.75	28.75	26.95	24
9/8/2015	18.65	14.45	12.65	17.85	24.05	23.5	23.1	26.05	28.75	28.75	26.95	24
9/9/2015	18.65	14.45	12.65	17.85	24.05	23.5	23.1	26.05	28.75	28.75	26.95	24
9/10/2015	18.65	14.45	12.65	17.85	24.05	23.5	23.1	26.05	28.75	28.75	26.95	24
9/11/2015	18.65	14.45	12.65	17.85	24.05	23.5	23.1	26.05	28.75	28.75	26.95	24
9/14/2015	19.15	14.85	13	18.3	24.7	24.1	23.7	26.75	29.5	28.75	26.95	24
9/15/2015	19.15	14.85	13	18.3	24.7	24.1	23.7	26.75	29.5	28.85	27.05	24.1
9/16/2015	19.15	14.85	13	18.3	24.7	24.1	23.7	26.75	29.5	28.85	27.05	24.1
9/17/2015	19.15	14.85	13	18.3	24.7	24.1	23.7	26.75	29.5	28.85	27.05	24.1
9/18/2015	19.15	14.85	13	18.3	24.7	24.1	23.7	26.75	29.5	28.85	27.05	24.1
9/21/2015	19.15	14.85	13	18.1	24.45	23.9	23.7	26.75	29.5	28.85	27.05	24.1
9/22/2015	19.05	14.75	12.9	18.1	24.45	23.9	23.15	26.1	28.8	28.85	27.05	24.1
9/23/2015	18.8	14.5	12.65	18.1	24.45	23.9	23.15	26.1	28.8	28.85	27.05	24.1
9/24/2015	18.8	14.5	12.65	18.1	24.45	23.9	23.15	26.1	28.8	28.85	27.05	24.1
9/25/2015	18.55	14.25	12.4	17.85	24.15	23.65	22.95	25.85	28.55	28.85	27.05	24.1
9/28/2015	18.6	14.25	12.4	17.8	24.1	23.6	22.45	25.3	27.9	27.95	26.2	23.35
9/29/2015	18.35	14.05	12.2	17.75	24.15	23.7	22.15	24.95	27.5	27.45	25.75	22.95
9/30/2015	18.35	14.05	12.2	17.75	24.15	23.7	22.15	24.95	27.5	26.95	25.3	22.55
Average LL	19.06	15.18	13.63	21.87	26.71	26.31	28.44	30.31	32.52	31.76	30.39	27.88
Max LL	21.02	16.76	15.39	30.20	33.37	33.84	37.52	37.39	38.26	38.81	38.12	36.36
Min LL	15.76	12.57	11.54	17.40	23.15	22.25	22.15	24.95	27.50	26.95	25.30	22.55
Spread	5.26	4.19	3.85	12.80	10.22	11.59	15.37	12.44	10.76	11.86	12.82	13.81

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe

Producer Price Index for Electric Power

October 23, 2015

Mnemonic: FXPPIFU4.US
Description: PPI: Electric Power - Total, (Index 1982=100, NSA) for United States
Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics (ECCA) Forecast
Native Frequency: QUARTERLY
Geography: United States

2010 Q1	178.2667
2010 Q2	184.6333
2010 Q3	192.2000
2010 Q4	182.4000
2011 Q1	184.0333
2011 Q2	188.1667
2011 Q3	195.4000
2011 Q4	187.9333
2012 Q1	185.8333
2012 Q2	188.8333
2012 Q3	196.8667
2012 Q4	190.4000
2013 Q1	189.1667
2013 Q2	193.1667
2013 Q3	199.3000
2013 Q4	191.7667
2014 Q1	195.7333
2014 Q2	200.8333
2014 Q3	208.3000
2014 Q4	199.0000
2015 Q1	200.8333
2015 Q2	203.5333
2015 Q3	209.1001
2015 Q4	198.4584
2016 Q1	196.9414
2016 Q2	200.4566
2016 Q3	207.1979
2016 Q4	198.9095
2017 Q1	200.2903
2017 Q2	206.1151
2017 Q3	214.8673
2017 Q4	207.2730
2018 Q1	209.2273
2018 Q2	215.5725
2018 Q3	224.8115
2018 Q4	216.9957
2019 Q1	218.9305
2019 Q2	225.2652
2019 Q3	234.4595
2019 Q4	225.8928
2020 Q1	227.3772
2020 Q2	233.3537
2020 Q3	242.2563
2020 Q4	232.9132

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe

Idaho Power Company's Forward Price Curves Discounted for Inflation
Used to Re-Price Purchased Power
and Surplus Sales for the October Update

October 23, 2015

IDAHO POWER COMPANY
MidC Forward Price Curves Discounted for Inflation
Used to Re-Price Purchased Power and Surplus Sales for the October Update

<u>Line</u>		Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
1	Forward Curve Prices												
2	Relevant Quarter	2017 Q2	2017 Q2	2017 Q2	2017 Q3	2017 Q3	2017 Q3	2017 Q4	2017 Q4	2017 Q4	2018 Q1	2018 Q1	2018 Q1
3	Deflator	2.0612	2.0612	2.0612	2.1487	2.1487	2.1487	2.0727	2.0727	2.0727	2.0923	2.0923	2.0923
4	Water Year	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
5	Relevant Quarter	2016 Q2	2016 Q2	2016 Q2	2016 Q3	2016 Q3	2016 Q3	2016 Q4	2016 Q4	2016 Q4	2017 Q1	2017 Q1	2017 Q1
6	Inflator	2.0046	2.0046	2.0046	2.0720	2.0720	2.0720	1.9891	1.9891	1.9891	2.0029	2.0029	2.0029
7	Average Prices	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
8	MidC HL	26.92	25.96	25.33	35.15	38.33	36.24	33.06	35.64	38.64	38.05	36.60	32.99
9	MidC LL	19.06	15.18	13.63	21.87	26.71	26.31	28.44	30.31	32.52	31.76	30.39	27.88
10	Inflation Adjusted	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
11	MidC HL	26.19	25.24	24.63	33.89	36.96	34.95	31.73	34.20	37.08	36.42	35.04	31.58
12	MidC LL	18.54	14.77	13.26	21.09	25.76	25.37	27.29	29.09	31.21	30.41	29.09	26.69
13	Difference	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
14	MidC HL	0.74	0.71	0.70	1.25	1.37	1.29	1.33	1.44	1.56	1.63	1.56	1.41
15	MidC LL	0.52	0.42	0.37	0.78	0.95	0.94	1.15	1.22	1.31	1.36	1.30	1.19
16	Reallocated Prices	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
17	HL Purchased Power												
18	103.9%	27.21	26.23	25.59	35.21	38.40	36.31	32.96	35.53	38.53	37.85	36.41	32.82
19	LL Purchased Power												
20	107.1%	19.86	15.82	14.20	22.59	27.59	27.17	29.23	31.16	33.42	32.57	31.16	28.59
21	HL Surplus Sales												
22	96.4%	25.24	24.33	23.75	32.67	35.63	33.69	30.58	32.97	35.74	35.11	33.78	30.45
23	LL Surplus Sales												
24	93.4%	17.32	13.79	12.38	19.70	24.06	23.69	25.49	27.17	29.15	28.40	27.17	24.93

Idaho Power/105
Witness: Kelley K. Noe

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe

Idaho Power Company's Power Supply Expenses for April 1, 2016 – March 31, 2017
(Multiple Gas Prices – 87 Years of Hydro)

October 23, 2015

Idaho Power/106
Witness: Kelley K. Noe

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe
Year-Over-Year Differences in Modeled Power Supply Expenses

October 23, 2015

YEAR OVER YEAR DIFFERENCES IN MODELED NPSE

NPSE RESULTS BEFORE MARKET ENERGY RE-PRICING			REPRICED USING FORWARD MARKET PRICES					DIFFERENCES			
GENERATION			GENERATION					GENERATION			
	A	B		C	D	E	F	G	H	I	J
Line No.	Resource Type	2015 October Update	2016 October Update	Resource Type	2015 October Update	2016 October Update		(B-A)	(E-C)	(C-A)	(E-B)
1	Hydro (MWh)	8,674,036	8,662,089	Hydro (MWh)	8,674,036	8,662,089	54%	(11,947)	(11,947)	-	-
2	Coal (MWh)	4,849,878	3,166,512	Coal (MWh)	4,849,878	3,166,512	31%	(1,683,365)	(1,683,365)	-	-
3	Natural Gas (MWh)	1,174,257	2,431,877	Natural Gas (MWh)	1,174,257	2,431,877	7%	1,257,619	1,257,619	-	-
	Purchased Power & Purchased			Purchased Power & Purchased							
4	Power Agreements (MWh)	906,196	855,324	Power Agreements (MWh)	906,196	855,324	6%	(50,872)	(50,872)	-	-
5	PURPA (MWh)	2,269,022	3,158,176	PURPA (MWh)	2,269,022	3,158,176	14%	889,154	889,154	-	-
6	Surplus Sales (MWh)	2,079,700	2,375,252	Surplus Sales (MWh)	2,079,700	2,375,252	13%	295,552	295,552	-	-
7	System Load (MWh)	15,793,689	15,898,726	System Load (MWh)	15,793,689	15,898,726	100%	105,037	105,037	-	-
8	System Load (aMW)	1,798	1,815	System Load (aMW)	1,798.01	1,814.92		12	12	-	-
NET POWER SUPPLY EXPENSES			NET POWER SUPPLY EXPENSES					NET POWER SUPPLY EXPENSES			
	A	B		C	D	E	F	G	H	I	J
Line No.	Resource Type	2015 October Update	2016 October Update	Resource Type	2015 October Update	2016 October Update		(B-A)	(E-C)	(C-A)	(E-B)
9	Hydro (\$ x 1000)	\$ -	\$ -	Hydro (\$ x 1000)	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -
10	Coal (\$ x 1000)	\$ 131,318.8	\$ 95,307.4	Coal (\$ x 1000)	\$ 131,318.8	\$ 95,307.4	39%	\$ (36,011.4)	\$ (36,011.4)	\$ -	\$ -
11	Natural Gas (\$ x 1000)	\$ 44,105.9	\$ 57,814.6	Natural Gas (\$ x 1000)	\$ 44,105.9	\$ 57,814.6	13%	\$ 13,708.6	\$ 13,708.6	\$ -	\$ -
	Purchased Power & Purchased			Purchased Power & Purchased							
12	Power Agreements (\$ x 1000)	\$ 53,676.7	\$ 49,243.9	Power Agreements (\$ x 1000)	\$ 52,882.0	\$ 51,005.9	16%	\$ (4,432.8)	\$ (1,876.1)	\$ (794.7)	\$ 1,761.9
13	PURPA (\$ x 1000)	\$ 172,757.7	\$ 208,893.4	PURPA (\$ x 1000)	\$ 172,757.7	\$ 208,893.4	51%	\$ 36,135.7	\$ 36,135.7	\$ -	\$ -
14	Surplus Sales (\$ x 1000)	\$ (56,098.4)	\$ (54,786.4)	Surplus Sales (\$ x 1000)	\$ (61,567.5)	\$ (60,993.1)	-18%	\$ 1,312.0	\$ 574.4	\$ (5,469.1)	\$ (6,206.7)
15	Total System (\$ x 1000)	\$ 345,760.7	\$ 356,472.8	Total System (\$ x 1000)	\$ 339,496.9	\$ 352,028.1	100%	\$ 10,712.1	\$ 12,531.2	\$ (6,263.8)	\$ (4,444.7)

Idaho Power/107
Witness: Kelley K. Noe

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe
Idaho Power Company's Rate Spread for October APCU Update

October 23, 2015

Idaho Power Company
Rate Spread Exhibit for October Update APCU -- O&M Outside AURORA

General Rate Case (UE 233): Marginal Cost-of-Service Study and Stipulated Revenue Spread														
2011 Test Period														
Line	Description	(A) TOTAL SYSTEM	(B) RESIDENTIAL (1)	(C) GEN SRV (2)	(D) GEN SRV SECONDARY (9-S)	(E) GEN SRV PRIMARY (9-P)	(F) GEN SRV TRANS (9-T)	(G) AREA LIGHTING (15)	(H) LG POWER PRIMARY (19-P)	(I) LG POWER TRANS (19-T)	(J) IRRIGATION SECONDARY (24-S)	(K) UNMETERED GEN SERVICE (40)	(L) MUNICIPAL ST LIGHT (41)	(M) TRAFFIC CONTROL (42)
1	Normalized Sales (kWh)	650,158,581	198,842,419	17,842,896	114,256,218	15,099,088	2,832,509	483,936	179,189,047	74,155,867	46,649,265	12,900	778,108	16,328
2	Current Revenue	\$39,873,591	\$15,355,932	\$1,559,400	\$6,975,915	\$798,102	\$154,997	\$112,462	\$8,213,065	\$3,123,393	\$3,454,271	\$972	\$123,851	\$1,231
3														
4	Demand Related Marginal Cost													
5	Generation - Staff Adj.	\$11,049,450	\$4,082,443	\$268,043	\$1,671,178	\$207,813	\$35,425	\$625	\$1,790,415	\$1,483,718	\$1,508,400	\$158	\$1,035	\$200
6	Transmission - Staff Adj.	\$12,432,118	\$4,593,297	\$301,584	\$1,880,300	\$233,817	\$39,858	\$703	\$2,014,458	\$1,669,382	\$1,697,153	\$177	\$1,165	\$225
7	Distribution	\$6,945,625	\$3,215,110	\$181,233	\$1,319,947	\$100,783	\$0	\$5,738	\$798,946	\$0	\$1,314,267	\$161	\$9,350	\$89
8														
9	Energy Related Marginal Cost													
10	Generation	\$28,547,004	\$8,940,577	\$802,452	\$5,140,232	\$649,911	\$117,743	\$21,383	\$7,662,010	\$3,097,424	\$2,079,568	\$570	\$34,414	\$722
11	Transmission - Staff Adj.	\$4,144,040	\$1,297,863	\$116,488	\$746,184	\$94,345	\$17,092	\$3,104	\$1,112,259	\$449,639	\$301,881	\$83	\$4,996	\$105
12														
13	Simple-Summed Energy-Related and Demand-Related Marginal Costs													
14	Generation Marginal Costs - Staff Adj.	\$39,596,454	\$13,023,020	\$1,070,495	\$6,811,410	\$857,724	\$153,168	\$22,008	\$9,452,425	\$4,581,142	\$3,587,968	\$728	\$35,449	\$922
15	Transmission Marginal Costs - Staff Adj.	\$16,576,157	\$5,891,160	\$418,072	\$2,626,484	\$328,162	\$56,950	\$3,807	\$3,126,717	\$2,119,021	\$1,999,034	\$260	\$6,160	\$330
16														
17	Customer Related Marginal Cost	\$2,805,903	\$1,967,110	\$385,570	\$177,410	\$6,719	\$1,390	\$0	\$15,208	\$2,535	\$246,967	\$228	\$1,892	\$873
18														
19	Total Functionalized Revenue Requirement													
20	Generation - Staff Adj.	\$25,202,690	\$8,289,003	\$681,357	\$4,335,384	\$545,931	\$97,490	\$14,008	\$6,016,360	\$2,915,844	\$2,283,701	\$463	\$22,563	\$587
21														
22	Transmission	\$4,272,366	\$1,518,397	\$107,755	\$676,954	\$84,581	\$14,678	\$981	\$805,885	\$546,160	\$515,234	\$67	\$1,588	\$85
23														
24	Distribution													
25	Demand-Related	\$8,930,530	\$4,133,917	\$233,025	\$1,697,158	\$129,585	\$0	\$7,378	\$1,027,267	\$0	\$1,689,855	\$207	\$12,022	\$114
26	Customer-Related													
27	Allocated	\$2,859,472	\$2,004,665	\$392,931	\$180,797	\$6,847	\$1,417	\$0	\$15,498	\$2,583	\$251,682	\$232	\$1,928	\$890
28	Direct Assignment	\$419,424	\$188,447	\$34,356	\$12,375	\$69	\$14	\$78,778	\$83	\$14	\$21,953	\$42	\$83,209	\$83
29														
30	Total: Staff-Adjusted Allocation	\$41,684,482	\$16,134,429	\$1,449,425	\$6,902,669	\$767,013	\$113,599	\$101,145	\$7,865,094	\$3,464,601	\$4,762,425	\$1,011	\$121,310	\$1,759
31	Revenue Deficiency - Staff Adj. Allocation	\$1,810,890	\$778,497	(\$109,975)	(\$73,246)	(\$31,089)	(\$41,398)	(\$11,317)	(\$347,971)	\$341,208	\$1,308,154	\$39	(\$2,541)	\$528
32	% Increase Required by Staff Adj. Alloc. Approach	4.54%	5.07%	-7.05%	-1.05%	-3.90%	-26.71%	-10.06%	-4.24%	10.92%	37.87%	4.02%	-2.05%	42.91%
33	% Increase Recommended per Stipulation	4.54%	5.62%	2.83%	2.83%	2.83%	0.00%	0.00%	2.83%	6.81%	6.81%	4.56%	2.83%	6.81%
34	Average Rate Given Stipulation (\$/kWh)	0.0641	0.0816	0.0899	0.0628	0.0544	0.0547	0.2324	0.0471	0.0450	0.0791	0.0788	0.1637	0.0805
35	Final Revenue Allocation	\$41,684,481	\$16,218,280	\$1,603,553	\$7,173,432	\$820,700	\$154,997	\$112,462	\$8,445,610	\$3,336,170	\$3,689,589	\$1,016	\$127,358	\$1,315
36														
37														
38	Spread Floors and Ceilings:													
39	No increase for those warranting a decrease greater than 8%													
40	2.83% increase for those warranting a decrease less than 8%													
41	No increase greater than one-and-one-half times the average increase													
2016 October Update APCU: Baseline Revenue Requirement Spread and Rates Development Employing the UE 233 Test Period Figures														
42	2016 October Update APCU Cost of Service (Allocator -- Line 14)	\$414,156	\$136,213	\$11,197	\$71,243	\$8,971	\$1,602	\$230	\$98,867	\$47,916	\$37,528	\$8	\$371	\$10
43	% Increase Required Due to APCU (Proposed) (Line 42/(Line 36))	0.99%	0.84%	0.70%	0.99%	1.09%	1.03%	0.20%	1.17%	1.44%	1.02%	0.75%	0.29%	0.73%
44	Loss-Adjusted 2011 Normalized Sales (kWh)	650,158,581	198,842,419	17,842,896	114,256,218	15,099,088	2,832,509	483,936	179,189,047	74,155,867	46,649,265	12,900	778,108	16,328
45	2016 October Update APCU Incremental Rate given 2011 Test Period Sales (Mills per kWh) (1000*(Line 42/(Line 44)))	0.637	0.685	0.628	0.624	0.594	0.566	0.476	0.552	0.646	0.804	0.590	0.477	0.591
46	APCU Incremental Rate for 2016 October Update (Mills per kWh) (Line 45*(Column A)/(Line 44/Line 47))	0.640	0.716	0.634	0.596	0.514	0.621	0.512	0.647	0.513	0.721	1.060	0.387	0.467
47	Loss-Adjusted 2016-2017 Normalized Sales (kWh)	647,119,324	190,168,278	17,665,305	119,527,748	17,449,883	2,579,991	449,841	152,823,914	93,388,338	52,080,312	7,178	957,896	20,640
48	Projected October Update APCU 2016-2017 Revenues (Line 46 * Line 47)	\$414,156	\$136,213	\$11,197	\$71,243	\$8,971	\$1,602	\$230	\$98,867	\$47,916	\$37,528	\$8	\$371	\$10

Notes:

- 2016 October Update APCU Revenues = (\$0.64)/MWh x 647,119.324 MWhs = \$ 414,156 (Line 52, Column A)
- (\$0.64)=\$24.08 (2016 October Update) - \$23.44 (2015 October APCU Rate)

Idaho Power/108
Witness: Kelley K. Noe

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

IDAHO POWER COMPANY

Exhibit Accompanying Testimony of Kelley K. Noe
Idaho Power Company's Current Billed Revenue to
Proposed Billed Revenue

October 23, 2015

**Idaho Power Company
Calculation of Revenue Impact
State of Oregon
2016 APCU October Update Filing
Effective June 1, 2016**

**Summary of Revenue Impact
Current Billed Revenue to Proposed Billed Revenue ⁽¹⁾**

Line No	Tariff Description	Rate Sch. No.	Average Number of Customers ⁽²⁾	Normalized Energy (kWh) ⁽²⁾	Current Billed Revenue	Mills Per kWh	Total Adjustments to Billed Revenue	Proposed Total Billed Revenue	Mills Per kWh	Percent Change Billed to Billed Revenue
<u>Uniform Tariff Rates:</u>										
1	Residential Service	1	13,795	190,168,278	\$19,000,275	99.91	\$136,160	\$19,136,435	100.63	0.72%
2	Small General Service	7	2,523	17,665,305	\$1,881,532	106.51	\$11,200	\$1,892,732	107.14	0.60%
3	Large General Service	9	929	139,557,622	\$10,791,323	77.33	\$81,810	\$10,873,133	77.91	0.76%
4	Dusk to Dawn Lighting	15	0	449,841	\$111,261	247.34	\$230	\$111,492	247.85	0.21%
5	Large Power Service	19	6	246,212,252	\$15,245,469	61.92	\$146,785	\$15,392,255	62.52	0.96%
6	Agricultural Irrigation Service	24	1,819	52,080,312	\$5,088,617	97.71	\$37,550	\$5,126,167	98.43	0.74%
7	Unmetered General Service	40	2	7,178	\$693	96.51	\$8	\$700	97.57	1.10%
8	Street Lighting	41	10	957,896	\$155,131	161.95	\$371	\$155,503	162.34	0.24%
9	Traffic Control Lighting	42	7	20,640	\$1,961	95.02	\$10	\$1,971	95.48	0.49%
10	Total Uniform Tariffs		19,091	647,119,324	\$52,276,264	80.78	\$414,124	\$52,690,388	81.42	0.79%
11	Total Oregon Retail Sales		19,091	647,119,324	\$52,276,264	80.78	\$414,124	\$52,690,388	81.42	0.79%

⁽¹⁾ Current Billed to Proposed Bill Revenues Reflect the October Update and the current March Forecast (unchanged)

⁽²⁾ Updated April 2016 - March 2017 Test Year