

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-17_____

DIRECT TESTIMONY OF

TARA L. KNOX

REPRESENTING AVISTA CORPORATION

1 **I. INTRODUCTION**

2 **Q. Please state your name, business address and present position with**
3 **Avista Corporation.**

4 A. My name is Tara L. Knox and my business address is 1411 East Mission
5 Avenue, Spokane, Washington. I am employed as a Senior Regulatory Analyst in the State
6 and Federal Regulation Department.

7 **Q. Would you briefly describe your duties?**

8 A. Yes. I am responsible for preparing the electric regulatory cost of service
9 model for the Company, as well as providing support for the preparation of results of
10 operations reports.

11 **Q. What is your educational background and professional experience?**

12 A. I am a graduate of Washington State University with a Bachelor of Arts
13 degree in General Humanities in 1982, and a Master of Accounting degree in 1990. As an
14 employee in the State and Federal Regulation Department at Avista since 1991, I have
15 attended several ratemaking classes, including the EEI Electric Rates Advanced Course that
16 specializes in cost allocation and cost of service issues. I am also a member of the Cost of
17 Service Working Group and the Northwest Pricing and Regulatory Forum, which are
18 discussion groups made up of technical professionals from regional utilities and utilities
19 throughout the United States and Canada concerned with cost of service issues.

20 **Q. What is the scope of your testimony in this proceeding?**

21 A. My testimony and exhibits will cover the Company's electric revenue
22 normalization adjustments and the electric cost of service study performed for this
23 proceeding. A table of contents for my testimony is as follows:

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7 **Q. Are you sponsoring any exhibits in this case?**

8 A. Yes. I am sponsoring Exh. TLK-2 which includes a narrative of the electric
9 cost of service study process, and Exh. TLK-3 presents the electric cost of service study
10 summary results.

11 **Q. Were these exhibits prepared by you or under your direction?**

12 A. Yes, they were.

13
14 **II. SUMMARY**

15 **Q. Please briefly summarize your testimony related to the electric cost of**
16 **service study.**

17 A. I believe the Base Case cost of service study presented in this case is a fair
18 representation of the costs to serve each customer group. The Base Case study shows
19 Residential Service Schedules 1/2, Pumping Service Schedules 31/32 and Street and Area
20 Lighting Service Schedules 41 - 48 provide less than the overall rate of return under present
21 rates. General Service Schedules 11/12 and Large General Service Schedules 21/22 provide
22 more than the overall rate of return under present rates. Extra Large General Service
23 Schedule 25 provides very close to the overall rate of return under present rates. Table No.

1 1 below shows the rate of return and the relationship of the customer class return to the
 2 overall return (relative return ratio) at present rates for each rate schedule:

3 **Table No. 1**

<u>Customer Class</u>	<u>Rate of Return</u>	<u>Return Ratio</u>
Residential Service Schedule 1/2	2.98%	0.56
General Service Schedules 11/12	10.91%	2.03
Large General Service Schedules 21/22	7.84%	1.46
Extra Large General Service Schedule 25	5.26%	0.98
Pumping Service Schedules 31/32	4.56%	0.85
Lighting Service Schedules 41 - 48	<u>3.82%</u>	<u>0.71</u>
Total Washington Electric System	<u>5.37%</u>	<u>1.00</u>

11
 12 **III. ELECTRIC REVENUE NORMALIZATION**

13 **Q. Would you please describe the electric revenue normalization**
 14 **adjustments included in Company witness Ms. Andrews’ Revenue Requirement**
 15 **Studies?**

16 A. Yes. As Ms. Andrews includes the same revenue adjustments in multiple
 17 studies¹, for ease of reference unless otherwise stated, my testimony will refer specifically to
 18 her Exh. EMA-3 Electric EOP Rate Base Study. Similar to the natural gas revenue
 19 normalization adjustment, sponsored by Company witness Mr. Miller, there are three
 20 separate adjustments that normalize revenue as part of Ms. Andrews’ electric EOP Rate
 21 Base Study:

¹ Ms. Andrews discusses four studies: 1) Pro Forma Study; 2) Rate Year Study; 3) EOP Rate Base Study; and 4) K-Factor Study. Restating and Pro Forma adjustments are consistent across the studies for which they are contained, with the exception of debt interest expense due to use of a different capital structure used within the electric and natural gas EOP Rate Base Studies.

1 **1. Weather Normalization:** Column 2.10 of Ms. Andrews' Exh. EMA-3, page 6 is
2 a Commission Basis weather normalization restating adjustment. Revenues for this
3 adjustment are based on rates that were in effect during the January 2016 through December
4 2016 test period, and kWh sales and revenues have been adjusted to reflect normal weather
5 conditions. The weather-related revenues associated with the Company's electric
6 decoupling mechanism are removed in this adjustment, as kWh sales and revenues have
7 been normalized to reflect normal weather conditions.

8 **2. Eliminate Adder Schedules:** In addition to the weather normalization
9 adjustment, Ms. Andrews' study also includes an Eliminate Adder Schedules restating
10 adjustment in column 2.11 of Exh. EMA-3, page 6, which removes the impact of adder
11 schedule revenues and related expenses during the January 2016 through December 2016
12 test period.

13 **3. Pro Forma Revenue:** The Pro Forma Revenue Normalization Adjustment in
14 column 3.08 of Exh. EMA-3, page 8, adjusts January 2016 through December 2016 test
15 period customers and usage for any known and measurable (pro forma) changes. In
16 addition, the adjustment re-prices billed, unbilled, and weather adjusted usage at the base
17 tariff rates approved for 2016, as if the January 11, 2016 base tariff rates were effective for
18 the full 12-months of the test year.

19
20 **Weather Normalization**

21 **Q. Please begin with the first revenue normalizing adjustment in the Pro**
22 **Forma End of Period Rate Base Study. What is the Commission Basis weather**
23 **normalization adjustment?**

1 A. Weather normalization is a required element of Commission Basis reporting
2 pursuant to WAC 480-100-257. The intent of this adjustment is for Commission Basis
3 adjusted revenues (and power supply costs) to reflect operations under normal temperature
4 conditions during the reporting period.

5 **Q. Please briefly summarize the electric weather normalization process.**

6 A. The Company's electric weather normalization adjustment calculates the
7 change in kWh usage required to adjust actual loads during the 12-months ended December
8 2016 test period to the amount expected if weather had been normal. This adjustment
9 incorporates the effect of both heating and cooling on weather-sensitive customer groups.
10 The weather adjustment is developed from regression analysis of ten years of billed usage
11 per customer and billing period heating and cooling degree-day data. The resulting seasonal
12 weather sensitivity factors (use-per-customer-per-heating-degree day and use-per-customer-
13 per-cooling-degree day) are multiplied by the monthly test period number of customers,
14 which is then multiplied by the difference between normal heating/cooling degree-days and
15 actual heating/cooling degree-days. This calculation produces the change in kWh usage
16 required to adjust existing loads to the amount expected if weather had been normal.

17 **Q. Have the seasonal weather sensitivity factors been updated since the last**
18 **rate case?**

19 A. Yes. The factors used in the weather adjustment are based on regression
20 analysis of monthly billed usage per customer from January 2006 through December 2015
21 which is the most recent completed analysis. Autoregressive terms were included in the
22 regressions in order to correct for autocorrelation in the data.

1 **Q. What data did you use to determine “normal” heating and cooling**
2 **degree days?**

3 A. Normal heating and cooling degree days are based on a rolling 30-year
4 average of heating and cooling degree-days reported for each month by the National
5 Weather Service for the Spokane Airport weather station. Each year the normal values are
6 adjusted to capture the most recent year with the oldest year dropping off, thereby reflecting
7 the most recent information available at the end of each calendar year. The calculation
8 includes the 30-year period from 1987 through 2016.

9 **Q. Is this proposed weather adjustment methodology consistent with the**
10 **methodology utilized in the Company’s last general rate case in Washington?**

11 A. Yes. The process for determining the weather sensitivity factors and the
12 monthly adjustment calculation are consistent with the methodology presented in Docket
13 No. UE-160228. This methodology has been used in every case and Commission Basis
14 Report since it was introduced in Docket No. UE-070804.

15 **Q. What was the change in kWhs resulting from weather normalization for**
16 **the 12-months ended December 2016 test year?**

17 A. Weather was warmer than normal throughout the test year. Since electric
18 usage is impacted by both heating and cooling, weather normalization required an increase
19 to usage for warm weather during the winter and spring months that was partially offset by a
20 reduction to usage for the hot summer months. Overall, the adjustment to normal required
21 the addition of 766 heating degree-days during the heating season² and the reduction of 19

² The heating season includes the months of January through June and October through December.

1 cooling degree-days during the summer season³. The annual total adjustment to Washington
 2 electric sales volumes was an addition of 80,859,543 kWhs, which is approximately 1.5% of
 3 billed usage.

4 **Q. What was the impact of this adjustment on restated results of**
 5 **operations?**

6 A. The Commission Basis weather normalization adjustment increased total
 7 electric revenues by \$7,392,000. The combined effect of netting the increase to revenue
 8 against the decoupling revenue offset of (\$5,775,000), resulted in net weather adjustment
 9 revenue of \$1,617,000.⁴ After an offsetting reduction for revenue-related expenses and
 10 taxes, the weather normalization adjustment produced an increase to net operating income of
 11 \$825,000, as shown below:

12	General Business Revenue (Sales)	\$7,392,000
13	Other Revenue (Decoupling Deferred)	<u>(\$5,775,000)</u>
	Total Revenue (Net Adjustment)	\$1,617,000
14	Less: Revenue Related Expenses	(\$348,000)
15	Less: Income Tax Expense	<u>(\$444,000)</u>
	Net Operating Income	\$825,000

16 The electric system monthly weather adjustment volumes were provided to
 17 Company witness Mr. Kalich as an input to the Power Supply analysis. The cost of the
 18 weather-related load change is reflected in both the “Authorized Power Supply” adjustment
 19 in column 2.18 and the “Pro Forma Power Supply and Transmission Revenue” adjustment
 20 in column 4.00 (pages 7 and 8, Exh. EMA-3).

21

³ The summer season includes the months of June through September. June is included in both seasons because both heating load and cooling load fluctuations occur during the month.

⁴ The Decoupling Mechanism went into effect January 1, 2015.

1 **Eliminate Adder Schedules**

2 **Q. Moving on to the second revenue normalizing adjustment, what is the**
3 **purpose of the Eliminate Adder Schedules restating adjustment?**

4 A. The Eliminate Adder Schedules adjustment removes both the revenues and
5 expenses associated with all adder schedule rates not accounted for in other adjustments.
6 These items are recovered/rebated by separate tariffs and therefore are not part of base rates.
7 The items eliminated from the test year include: Schedule 59 Residential Exchange credit,
8 Schedule 75 Decoupling rate adjustment, Schedule 89 Fixed-Income Senior and Disabled
9 Residential Service Discount rate adjustment, Schedule 91 Demand Side Management rate
10 adjustment, Schedule 92, Low Income Rate Assistance Program rate adjustment, the
11 unbilled portion of Schedule 93 Energy Recovery Mechanism rate adjustment, Schedule 95
12 Optional Renewable Power rate, and the unbilled portion of Schedule 98 Renewable Energy
13 Credit Revenue Mechanism.

14 **Q. What was the impact of the Eliminate Adder Schedule adjustment on**
15 **restated results of operations?**

16 A. The Eliminate Adder Schedule adjustment results in an equal and offsetting
17 reduction to both revenue and expense and has no impact on net income. The billed portion
18 of Schedules 93 and 98 are eliminated in the Eliminate WA Power Cost Deferral adjustment
19 2.13 on page 7 of Exh. EMA-3, and Schedule 58 Municipal Tax Adjustment is eliminated in
20 the Eliminate B&O Taxes adjustment 2.01 on page 5 of Exh. EMA-3. After these
21 adjustments the Restated Total General Business revenue (column R-Ttl on page 7 of Exh.
22 EMA-3) represents weather normalized base rate revenue received during the 12-months
23 ended December 31, 2016 test period.

1 **Pro Forma Revenue**

2 **Q. Please describe the purpose of third revenue normalizing adjustment,**
3 **the Pro Forma Revenue Normalization adjustment?**

4 A. The purpose of the Pro Forma Revenue Normalization adjustment is to
5 restate revenue on a forward-looking basis. This is accomplished by re-pricing test year
6 normalized billing determinants (including unbilled and weather adjustments, as well as any
7 known and measurable changes to the test year loads and customers) to reflect revenues for
8 the January 2016 through December 2016 test period, as if the base tariff rates approved in
9 Docket No. UE-150204 effective January 11, 2016 had been in effect for the full 12 months
10 of the test period.⁵

11 **Q. What is the impact of the Pro Forma Revenue Normalization**
12 **adjustment?**

13 A. The Pro Forma Revenue Normalization adjustment decreases revenue by
14 \$1,225,000. The combined effect of the decrease to revenue from rates with the elimination
15 of both the 2016 restated decoupling deferred revenue of (-\$6,233,000) and the 2016
16 provision for rate refund (+\$2,346,000), resulted in a total pro forma revenue adjustment
17 decrease of \$5,112,000. After an offset for revenue-related expenses and taxes, Washington
18 net operating income decreased \$3,286,000, as shown below and in column 3.08 on page 8
19 of Exh. EMA-3.

⁵ The Pro Forma Normalized Revenue does not include any pro formed decoupling deferred revenue. The decoupling base will be updated with the rates approved for this case based on the same usage and customers used to determine revenue from present rates in this adjustment.

1	General Business Revenue (Sales)	(\$1,225,000)
2	Other Revenue (Elim.Decoupling Deferred)	(\$6,233,000)
3	Other Revenue (Elim. Provision for Refund)	<u>\$2,346,000</u>
4	Total Revenue (Net Adjustment)	\$5,112,000
5	Less: Revenue Related Expenses	(\$57,000)
6	Less: Income Tax Expense	<u>(\$1,769,000)</u>
7	Net Operating Income	\$3,286,000

8 **Q. Are you sponsoring any other revenue adjustments included in Ms.**
 9 **Andrews’ studies?**

10 A. Yes. In addition to the revenue adjustments described above that are
 11 included in both the Pro Forma Study and the EOP Rate Base Study, Ms. Andrews’ Rate
 12 Year Study also includes three “Rate Period Revenue” adjustments, one for each year of the
 13 Three-Year Rate Plan⁶. For each of these adjustments, the Company’s forecasted usage and
 14 customers in the specified rate periods have been priced at present rates⁷ to determine the
 15 expected revenues from customer growth and load growth. Ms. Andrews also used the
 16 expected incremental revenue from present rates as a reduction in the development of the K-
 17 factor escalation rate in her K-Factor Study.

18 **IV. ELECTRIC COST OF SERVICE**

19 **Q. Please identify the Company’s electric cost studies presented to this**
 20 **Commission in the last five years as required by WAC 480-07-510 (6).**

21 A. Electric cost of service studies were presented to this Commission in Docket
 No. UE-110876, Docket No. UE-120436 Docket No. UE-140188, Docket No. UE-150204
 and Docket No. UE-160228.

⁶ Included as Rate Year Adjustments 18.06, 19.04, and 20.04, of Exh. EMA-5.

⁷ The rate period revenue estimation includes a determination of estimated deferred revenue under the Decoupling Mechanism given the decoupling base is revised with test year revenues at present rates from the Pro Forma Revenue model. The cost of providing incremental load in each year of the three-year rate plan is determined using the Retail Revenue Adjustment rate embedded in the decoupling base at present rates.

1 **Q. What is an electric cost of service study and what is its purpose?**

2 A. An electric cost of service study is an engineering-economic study, which
3 separates the revenue, expenses, and rate base associated with providing electric service to
4 designated groups of customers. The groups are made up of customers with similar load
5 characteristics and facilities requirements. Costs are assigned or allocated to each group
6 based on (among other things), test period load and facilities requirements, resulting in an
7 evaluation of the cost of the service provided to each group. The rate of return by customer
8 group indicates whether the revenue provided by the customers in each group recovers the
9 cost to serve those customers. The study results are used as a guide in determining the
10 appropriate rate spread among the groups of customers. Exh. TLK-2 explains the basic
11 concepts involved in performing an electric cost of service study. It also details the specific
12 methodology and assumptions utilized in the Company's Base Case cost of service study.

13 **Q. What is the basis for the electric cost of service study provided in this**
14 **case?**

15 A. The electric cost of service study provided by the Company as Exh. TLK-3 is
16 based on the EOP Rate Base Study presented by Company witness Ms. Andrews as Exh.
17 EMA-3.

18 **Q. Would you please explain the cost of service study presented in Exh.**
19 **TLK-3?**

20 A. Yes. Exh. TLK-3 is composed of a series of summaries of the cost of service
21 study results. The summary on page 1 shows the results of the study by FERC account
22 category. The rate of return by rate schedule and the ratio of each schedule's return to the
23 overall return are shown on Lines 39 and 40. This summary was provided to Company

1 witness Mr. Ehrbar for his consideration regarding rate spread and rate design. The results
2 will be discussed in more detail later in my testimony.

3 Pages 2 and 3 are both summaries that show the revenue-to-cost relationship at
4 current and proposed revenue. Costs by category are shown first at the existing schedule
5 returns (revenue); next the costs are shown as if all schedules were providing equal recovery
6 (cost). These comparisons show how far current and proposed rates are from rates that
7 would be in alignment with the cost study. Page 2 shows the costs segregated into
8 production, transmission, distribution, and common functional categories. Line 44 on page
9 2 shows the target change in revenue which would produce unity in this cost study. Page 3
10 segregates the costs into demand, energy, and customer classifications. Page 4 is a summary
11 identifying specific customer related costs embedded in the study.

12 The Excel model used to calculate the cost of service and supporting schedules has
13 been included in its entirety both electronically and in hard copy in the workpapers
14 accompanying this case.

15 **Q. Given that the specific details of this methodology are described in the**
16 **narrative in Exh. TLK-2, would you please give a brief overview of the key elements**
17 **and the history associated with those elements?**

18 A. Yes. In general, the cost study follows the methodology established in
19 Docket No. UE-920499 for Puget Sound Power and Light (now Puget Sound Energy).
20 Production and transmission costs are classified into energy-related and demand-related by a
21 peak credit analysis. The definitions of “peaks” and “peak credit” specific to Avista were
22 accepted by the Commission for Avista in Docket No. UE-991606 and confirmed in Docket
23 No. UE-050482.

1 Distribution costs are classified and allocated by the basic customer theory⁸ that was
2 derived directly from the methodology approved for Puget in Docket No. UE-920499.
3 Administrative and general costs are first directly assigned to production, transmission,
4 distribution, and customer relations functions. The Commission found this process
5 acceptable in Avista's Docket No. UE-991606. The remaining administrative and general
6 costs are categorized as common costs and have been allocated by a variety of factors as
7 approved by this Commission for Puget in Docket No. UE-920499. The specific factors and
8 items they are applied to are described in detail in Exh. TLK-2 on page 5 and listed by
9 account on page 9.

10 **Q. Does the Company's electric Base Case cost of service study follow the**
11 **methodology filed in the Company's last electric general rate case in Washington?**

12 A. Yes. The methodology presented in this case is the same as that used in the
13 studies presented in Docket Nos. UE-160228, UE-150204, UE-140188, UE-120436 and UE-
14 110876.

15 **Q. What peak credit methodology did the Company use in this case?**

16 A. In this case the Company used the system load factor to determine the
17 proportion of the production function that is demand-related.⁹ This single peak credit ratio
18 is then applied uniformly to all production costs. In Washington, transmission costs have
19 traditionally been treated as an extension of the generation system, therefore, the peak credit
20 ratio has also been applied to transmission costs in this study.

⁸ Basic customer theory classifies only meters, services and street lights as customer-related plant; all other distribution facilities are considered demand-related.

⁹ One minus the load factor equals the demand percentage or peak credit ratio.

1 **Q. What are the benefits of using the system load factor to determine the**
2 **peak credit ratio?**

3 A. There are several benefits to the system load factor approach for identifying
4 the demand-related proportion of production costs: 1) it is simple and straightforward to
5 calculate; 2) it is directly related to the system and test year under evaluation; and 3) the
6 relationship should remain relatively stable from year to year.

7 **Q. What are the results in this case using the system load factor peak credit**
8 **methodology?**

9 A. Under the system load factor peak credit methodology, 37.65% of total
10 production and transmission costs are classified as demand-related, and 62.35% are
11 classified as energy-related.

12 **Q. What are the results of the Company's electric cost of service study**
13 **presented in this case?**

14 A. Table No. 2 shows the rate of return and the relationship of the customer
15 class return to the overall return (relative return ratio) at present rates for each rate schedule:

16

1 **Table No. 2**

<u>Customer Class</u>	<u>Rate of Return</u>	<u>Return Ratio</u>
Residential Service Schedule 1/2	2.98%	0.56
General Service Schedules 11/12	10.91%	2.03
Large General Service Schedules 21/22	7.84%	1.46
Extra Large General Service Schedule 25	5.26%	0.98
Pumping Service Schedules 31/32	4.56%	0.85
Lighting Service Schedules 41 - 49	<u>3.82%</u>	<u>0.71</u>
Total Washington Electric System	<u>5.37%</u>	<u>1.00</u>

9 As can be observed from the above table, Residential service Schedules 1/2 shows
10 under-recovery of the costs to serve them. Pumping service Schedules 31/32 and the Street
11 and Area Lighting service Schedules 41-48 show moderate under-recovery. The Extra
12 Large General service Schedule 25 is essentially at unity with the overall return from present
13 rates. However, the General and Large General service Schedules 11/12 and 21/22,
14 respectively, show over-recovery of the costs to serve them. The summary results of this
15 study were provided to Mr. Ehrbar for consideration in the development of proposed rates.

16 **Q. Does this conclude your pre-filed direct testimony?**

17 A. Yes.