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BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF AVISTA CORPORATION FOR THE AUTHORITY TO INCREASE ITS RATES AND CHARGES FOR ELECTRIC AND NATURAL GAS SERVICE TO ELECTRIC AND NATURAL GAS CUSTOMERS IN THE STATE OF IDAHO	)))))))	CASE NO. AVU-E-23-01 CASE NO. AVU-G-23-01 DIRECT TESTIMONY OF GRANT D. FORSYTH

FOR AVISTA CORPORATION

(ELECTRIC AND NATURAL GAS)

I. INTRODUCTION

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

A. My name is Dr. Grant D. Forsyth and my business address is 1411 East Mission Avenue, Spokane, Washington. I am presently assigned to the Financial Planning and Analysis Department as Chief Economist.

Q. Would you briefly describe your educational background and professional experience?

A. Yes. I am a graduate of Central Washington University with a Bachelor of Arts Degree in Economics, the University of Oregon with an MBA in Finance, and Washington State University with a Ph.D. in Economics. Before joining Avista in April 2012, I was a tenured faculty member in the Department of Economics at Eastern Washington University. In my 13-year career at EWU, beginning in 1999, I specialized in money and banking, macroeconomics, international finance, and regional economic analysis. The majority of my academic research used applied econometrics. Prior to EWU, I worked in the Czech Republic as an academic economist (1996-1997) and private sector economist (1997-1999) in the Czech financial industry. My financial industry position was the Director of Research for a diversified Czech financial holding company. In this position I oversaw a staff doing both equity and macroeconomic research.

Q. What are your current job duties at Avista?

A. My primary job duties at Avista include generating the customer and load forecasts for electric and natural gas operations,[1] and generating the peak load forecast for

[1] My forecasts are used by the Company's Financial Planning and Analysis department in the development of the financial forecast. It is also frequently used as modeling inputs by the Company's Energy Supply Department, led by Company witness Mr. Kinney.

electric operations. I also participate in various external policy groups, such as the Washington Governor's Council of Economic Advisors and Washington's Citizen Commission for Performance Measurement of Tax Preferences.

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

A. First, my testimony describes the inflationary pressures facing the Company that Company witness Mr. Vermillion discussed in his testimony, and which Company witness Ms. Andrews uses as support for her electric and natural gas Pro Forma Miscellaneous O&M Expense adjustments, which reflect escalated increases in certain Company O&M and A&G expenses above test period levels. Second, I will discuss the proposed methodology changes to the Company's weather normalization process.

Q. Are you sponsoring any exhibits to be introduced in this proceeding?

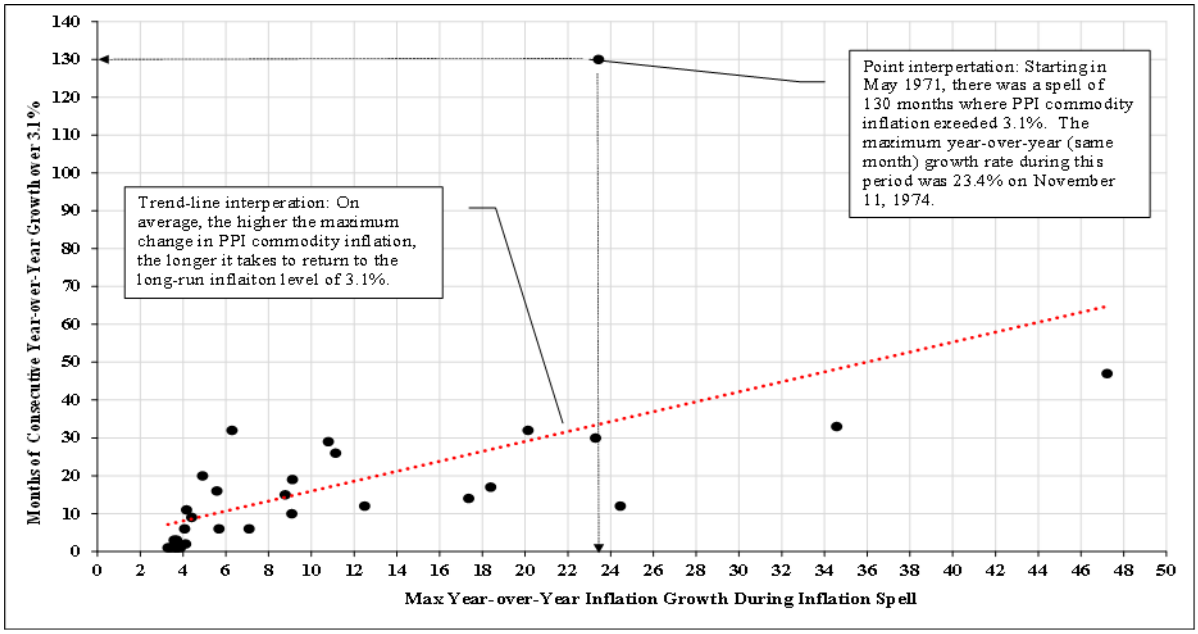
A. No, I am not.

II. INFLATIONARY IMPACTS ON GROWTH RATES

Q. Please describe the inflationary environment facing the Company today.

A. Because of the supply chain disruptions caused by the COVID pandemic, and more recently the effects of the war in the Ukraine, markets are experiencing escalating inflation rates at both the consumer and producer (business-to-business) level. Escalating inflation impacts the cost of the goods and services purchased by the Company. Historically, the length of time (often called a "spell") that inflation remains above the long-run average is strongly correlated with the size of the inflation spike. Figure No. 1 below demonstrates this point by looking at spells of producer price inflation that have exceeded the long-run average.

Figure No. 1: Relationship Between Duration of Inflation Spell and Inflation Severity



The underlying producer price inflation data for Figure No. 1 is the All Commodity Producer Price Index (PPIACO) calculated by the Bureau of Labor Statistics.[2] The monthly PPIACO data extends back to 1913. Since 1913, average annual PPICO inflation has been about 3.1%. Using this average, it is possible to examine spells of inflation consistently above 3.1% and those spells' correlation to the maximum year-over-year, same month inflation that occurred during that spell. Between 1913 and 2020, the U.S. experienced 32 spells of above average (over 3.1%) inflation ranging in duration from one month to 130 months. Figure No. 1 plots the duration (in months) of each spell against the maximum year-over-year, same month inflation rate that occurred during that spell. The red-dotted

[2] U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: All Commodities [PPIACO], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PPIACO. The calculation "year-over-year, same month" means calculating monthly inflation rates relative to the same month in the previous year. Performing this calculation since 1913 and taking the average produces a long-run growth rate of 3.1%. A similar value is produced if one just uses the annual PPICO index to calculate inflation rates since 1913. The PPIACO covers a broad range of products, which can be found at https://www.bls.gov/web/ppi/ppitable09.pdf. Starting in July 2009, services were added to the PPPIACO. A description of the different Producer Price Indexes can be found at https://www.bls.gov/news.release/ppi.tn.htm.

line in Figure No. 1 shows the regression relationship between the spell duration and the maximum inflation rate (year-over-year, same month basis) during that spell.

Q. With all of that background, what should one glean from that information?

A. The point of Figure No. 1 is that the regression line clearly shows that on average, the higher the inflation spike, the longer the duration of the inflation spell. Figure No. 2 below shows year-over-year, same month growth for the PPIACO calculated by the Bureau of Labor Statistics for the period 2020 through 2022.

Figure No. 2: Recent Producer Inflation Behavior

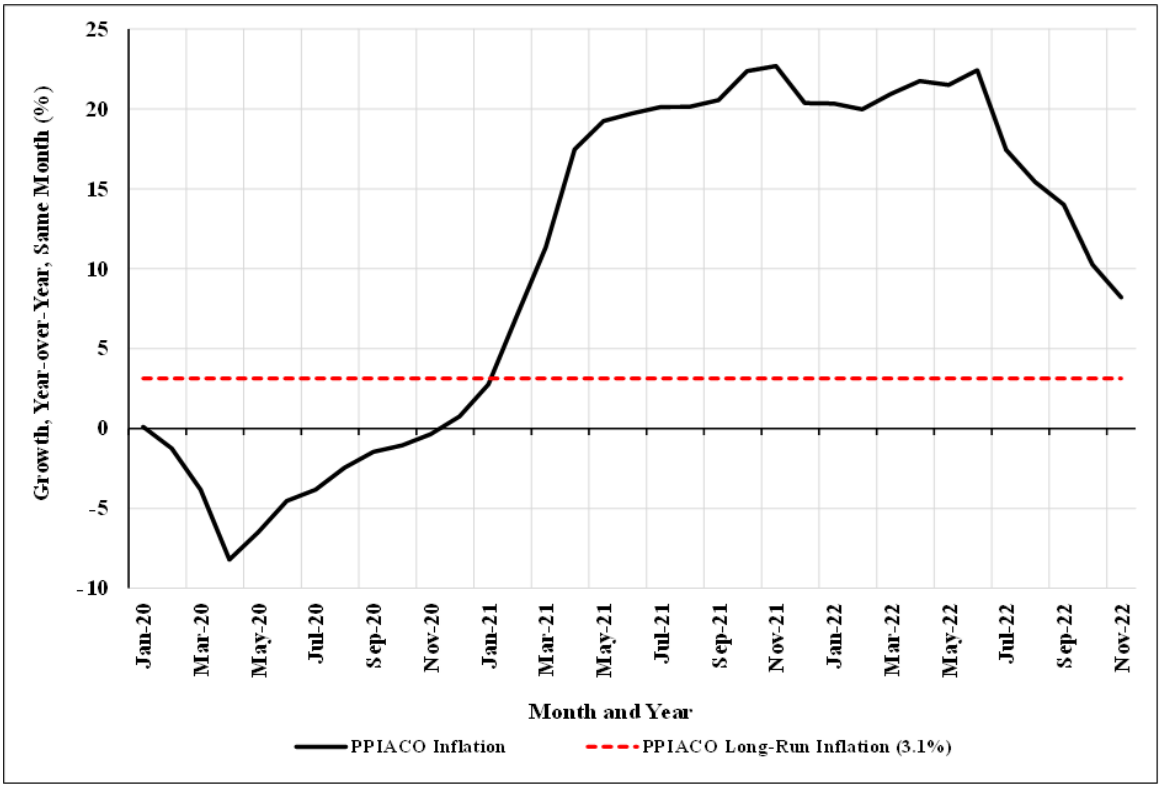


Figure No. 2 shows that a new above average inflation spell started in February 2021. By November 2021, the year-over-year, same month growth rate exceeded 20% and peaked around 23%. The size of the current spike suggests that the current inflation spell

could be prolonged. In turn, this could have a prolonged impact on future expenditure growth as the prices of the goods and services purchased by the Company increase at a faster than average rate.

Q. Are there other measures of inflation that are relevant to Avista?

A. Yes. The top graph in Figure No. 3 shows the Producer Price Index for Stage 2 intermediate good inputs (excluding food and energy), Stage 2 for services inputs, and Stage 2 construction inputs related to maintenance and repair. [3] The bottom graph in Figure No. 3 shows annual growth for the Consumer Price Index for urban consumers (CPI-U); the Personal Consumption Expenditures Index (PCEI), the Federal Reserve's preferred measure of consumer inflation.[4]

[3] The base index data used for Figure 3 was retrieved from the FRED data base at the Federal Reserve Bank of St. Louis. The FRED data links are:

(1) U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items in U.S. City Average [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CPIAUCSL.

(2) U.S. Bureau of Economic Analysis, Personal Consumption Expenditures: Chain-type Price Index [PCEPI], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PCEPI.

(3) U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Intermediate Demand by Production Flow: Inputs to Stage 2 Goods Producers, Goods Excluding Foods and Energy [WPSID52113], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/WPSID52113.

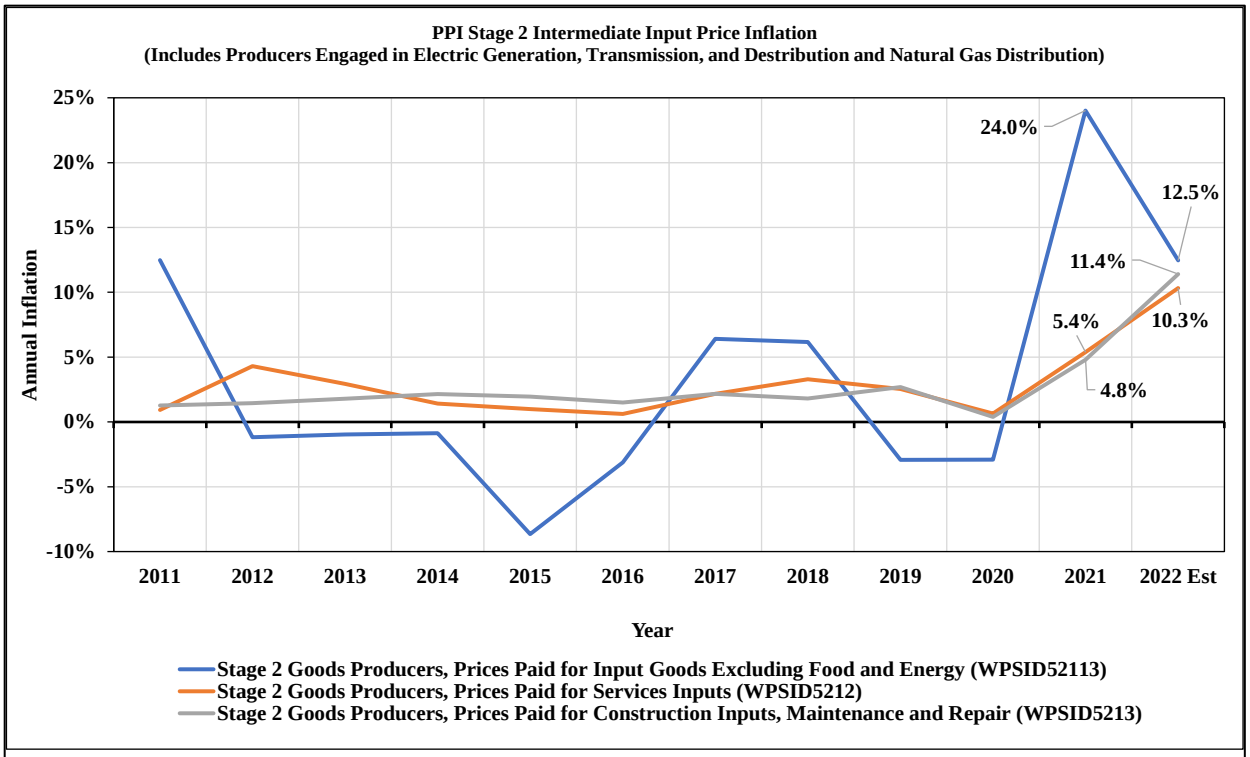
(4) U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Intermediate Demand by Production Flow: Inputs to Stage 2 Goods Producers, Services [WPSID5212], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/WPSID5212.

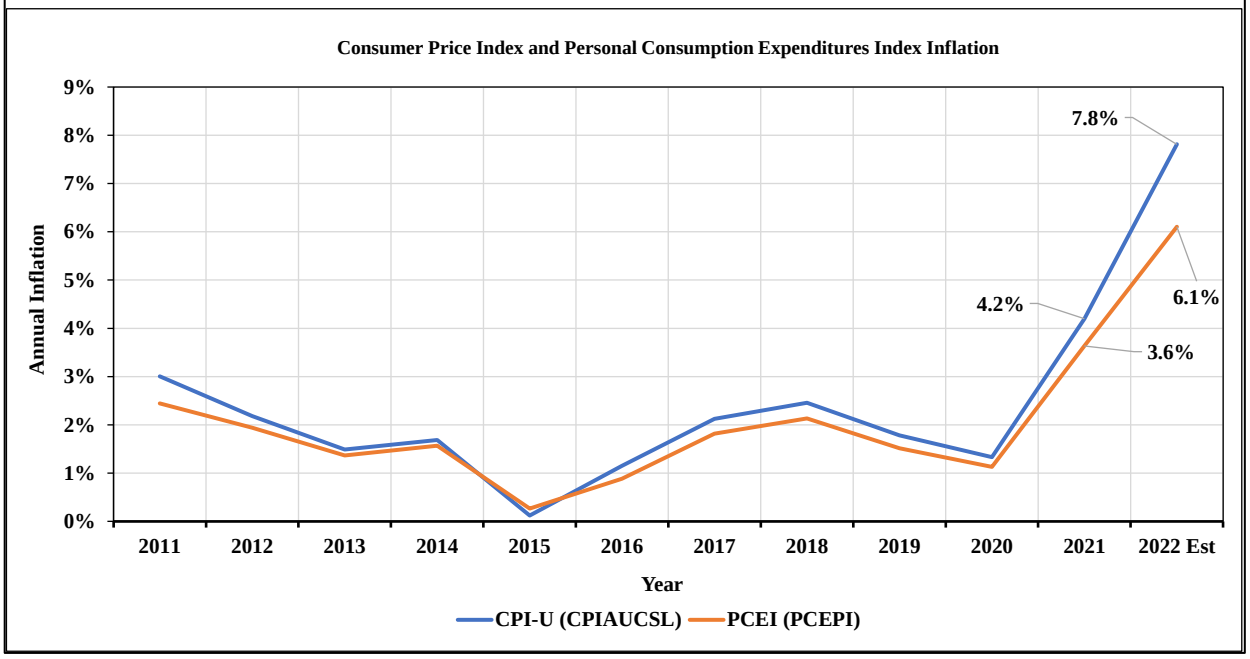
(5) U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Intermediate Demand by Production Flow: Inputs to Stage 2 Goods Producers, Construction [WPSID5213], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/WPSID5213.

That data has been seasonally adjusted by the Bureau of Labor Statistics.

[4] The BLS provides an overview of the CPI at https://www.bls.gov/cpi/overview.htm.

Figure No. 3: Recent Inflation Behavior from other Index Measures





The Stage 2 Producer Price Indexes are measuring input prices (excluding finished capital investment) paid by Stage 2 producers.[5] Companies like Avista are classified within Stage 2—this stage includes (among other industries) producers related to generation, transmission, distribution, and natural gas distribution.[6] These consumer price indices are measuring prices paid by urban households. Since Avista is a business purchasing inputs, and not an urban household, the Company views input inflation as the relevant measure of cost pressures. Note that input price inflation in 2021 and 2022 (2022 is estimated with data through November) has been higher than head-line consumer inflation measured by the CPI-U or the PCEI. The difference between input and comsumer inflation is particularly large for 2022. In this context the adjustment for certain Operation and Maintenace expenditures requested by Ms. Andrews is considerablly lower than 2022 input inflation for Stage 2 producers.

Q. Does Avista believe the Federal Reserve's interest rate increases in 2023 will lower inflation?

A. Yes, but with a significant lag. The Federal Reserve's interest rate increases will put downward pressure on inflation, but with a long lag between the rate increases and changes in the inflation rate. The lag between a monetary policy change and changes to economic activity is called "transmission lag." The Federal Reserve notes:

> It can take a fairly long time for a monetary policy action to affect the economy and inflation. And the lags can vary a lot, too. For example, the

[5] See for the most recent PPI release https://www.bls.gov/news.release/ppi.toc.htm. Once there, choose the link "Technical Notes." According the BLS, "The system includes two parallel treatments of intermediate demand. The first treatment organizes intermediate demand commodities by type. The second organizes intermediate demand commodities into production stages, with the explicit goal of developing a forward-flow model of production and price change." The second type is discussed in this testimony. Because capital goods (including finished buildings) are considered final demand goods, they are excluded from the intermediate demand indexes.

[6] The BLS producer composition at each stage can be seen in Appendix B at https://www.bls.gov/ppi/notices/2015/ppi-updates-commodity-weight-allocations-for-the-final-demand-intermediate-demand-aggregation-structure.htm#appendix-b.

> major effects on output can take anywhere from three months to two years. And the effects on inflation tend to involve even longer lags, **perhaps one to three years**, or more.[7] (emphasis added)

In the context of current Federal Reserve policy towards higher interest rates (i.e., lower money supply growth), GDP growth will likely slow significantly before the inflation slows. This means that the inflation pressures currently being experienced by the Company will not return to pre-2021 levels quickly. That is, inflation will likely show a significant amount of persistence following the Federal Reserve's move to increase interest rates by slowing the growth rate in the money supply.

III. WEATHER NORMALIZATION METHODOLOGY CHANGES

Q. As part of Settlement approved in the Company's last general rate case, did the Parties agree to "meet and confer" on the merits of differing weather normalization methodologies?

A. Yes. Provision 25 of the Settlement Stipulation in Case No. AVU-E-21-01 stated the following:

> Weather Normalization – Avista agrees to meet and confer with Staff, and interested parties, on its weather normalization methodologies, with the intention to see what changes, if any, should be made to further the accuracy of its modeling.

In compliance with that agreement, the Parties held a virtual meeting on May 4, 2022 to discuss the merits of differing weather normalization methodologies. Based on discussion and feedback from that meeting, the Company analyzed its weather normalization process and is proposing, in this case, to (1) adjust the definition of "normal" weather from a 30-

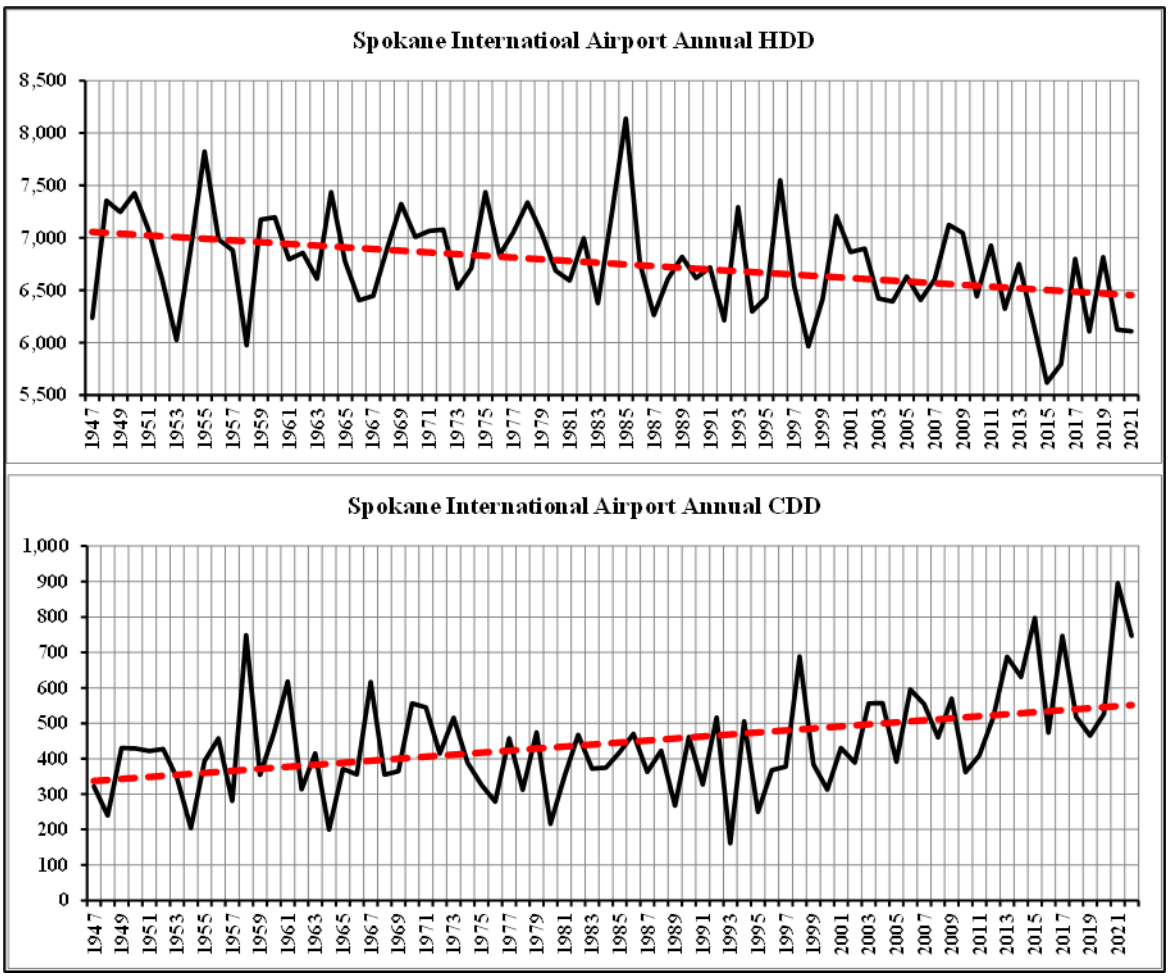
[7] See https://www.frbsf.org/education/teacher-resources/us-monetary-policy-introduction/real-interest-rates-economy/ under the heading

year rolling average to a 20-year rolling average, and (2) to adjust its non-degree day seasonal regression factors from seasonal factors to monthly factors.

Q. Regarding the first change, can you describe why the Company is proposing to move from a 30-year rolling average to a 20-year rolling average?

A. Yes, the Company is moving to a 20-year rolling average for two reasons. First, the Company believes that the 20-year rolling average better captures the ongoing trends in heating degree days (HDD) and cooling degree days (CDD) shown in Figure 4.

Figure No. 4: Heating and Cooling Degree Days since 1947



The first graph in Figure 4 shows that starting in late 1980s, HDD started to decline. In contrast, in the early 2000s, CDD started to increase. This is represented by the dashed

lines in Figure No. 4 above. For the pre-trend period, 1947 to 1989, average annual HDD were 6,907 compared to 6,477 for the 2002-2021 20-year period—on average, a decline of over 430 HDD a year, or 6.2%. For the pre-trend period, 1947 to 1999, average annual CDD were about 399 compared to 555 for the 2002-2021 twenty-year period—on average, an increase of 156 CDD a year, or 34.5%. Based on these trends, the Company believes using a 30-year average will allocate too many HDD and too few CDD.

The second reason for using a 20-year rolling average is to sync up the weather adjustment definition of normal weather with other parts of the Company, including the definition of normal weather used for the load forecasts for the Company's Integrated Resource Plans (IRP) and revenue models.

Q. Regarding the second Weather Normalization proposed change, can you describe why the Company is proposing to move from non-degree day seasonal regression factors to monthly factors?

A. Yes. The using of seasonal factors can obscure non-degree day influences that are unique to each month, especially in transitional months like June and October. Using monthly factors improved the models' fit and helped to eliminate the need for error corrected regressions (also known as autocorrelated error regressions) that the Company used in the previous weather normalization method.

Q. Has the Company quantified the difference between a 30-year rolling average and a 20-year rolling average?

A. Yes. This comparison is done in two ways. The first way was to compare the new method, which uses a 20-year rolling average, with the previous method, which used a 30-year rolling average. The second way was to compare the new method with a 20-year rolling average, to the new method using a 30-year rolling average.

Q. Has the Company quantified the kilowatt hour (kWh) and therm (THM) difference on an annual basis of making proposed weather normalization methodology changes described above?

A. Yes. Based on a comparison of actual calendarized usage for 2021, Table No. 1 shows the kWh and THM differences between the new weather normalization methodology changes.

Table No. 1: Idaho Weather Normalization Comparison for Calendar Year 2021

Weather Normalization Method	Total Electric, kWh	Total Natural Gas, THM
New Method, ID 20-yr Rolling Average	**3,045,675,694**	**151,143,989**
New Method ID, 30-yr Rolling Average	**3,041,354,737**	**151,762,005**
Previous Method, 30-yr Rolling Average	**3,027,612,009**	**153,023,302**
% Difference Comparison	**Total, % Diff**	**Total, % Diff**
20-yr New Method to 30-yr Previous Method	**0.6%**	**-1.2%**
30-yr New Method to 30-yr Previous Method	**0.5%**	**-0.8%**
20-yr New Method to 30-yr New Method	**0.1%**	**-0.4%**
Load Difference Comparison	**Total, kWh Diff**	**Total, THM Diff**
20-yr New Method to 30-yr Previous Method	**18,063,685**	**(1,879,313)**
30-yr New Method to 30-yr Previous Method	**13,742,728**	**(1,261,296)**
20-yr New Method to 30-yr New Method	**4,320,957**	**(618,017)**

In the Company's view, the annual differences of 0.6% for electric (about 18 million kilowatt hours) and 1.2% for natural gas (about 1.9 million therms) are not material. In addition to the new method assuming less HDD and more CDD (using a 20-year rolling average), observed differences between the new and the previous methods also reflect the use of monthly factors in place of seasonal factors; the assumption (in some schedules) of

non-linearity between HDD and use-per-customer;[8] and the addition of net unbilled usage before weather normalization occurs.[9] The Company believes each of these changes improves and streamlines the weather normalization process and eliminates the need for specialized econometric software. [10]

Q. Is the weather normalization adjustment incorporated into the proposed revenue requirement adjustments in this case?

A. Yes. The weather normalization adjustment is a component of the revenue normalization adjustment which is sponsored by Company witness Mr. Garbarino for electric operations, and Company witness Mr. Anderson for natural gas operations. Please refer to their testimonies for a full description of the revenue normalization adjustment and its components.

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

A. Yes.

[8] It can be shown that for certain schedules, the relationship between monthly HDD and monthly use-per-customer is non-linear. In linear regression, this can be controlled for by adding squared or cubed values of monthly HDD.

[9] Because the new method adjusts for monthly net unbilled load before the weather normalization is done, monthly billed load is calendarized **before** the weather normalization occurs. The previous method calendarized monthly load by adding net unbilled **after** the weather normalization of the billed load. The new method recognizes that net unbilled load can be influenced by weather; this means adjusting billed load for net unbilled load before weather normalization is preferable.

[10] The proposed modeling approach eliminates the need for autocorrelated error regressions. This means all regressions are now done in Excel without the aid of E-views or other specialized econometrics software. The Excel based regressions have been built with diagnostic checks to validate model fit.