

BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

**IN THE MATTER OF THE APPLICATION)
OF BLACK HILLS NEBRASKA GAS, LLC,)
D/B/A BLACK HILLS ENERGY, RAPID) APPLICATION NO. NG-109
CITY, SOUTH DAKOTA, SEEKING)
APPROVAL OF A GENERAL RATE)
INCREASE)**

DIRECT TESTIMONY OF DOUGLAS N. HYATT

Principal Regulatory & Finance Analyst

ON BEHALF OF

BLACK HILLS NEBRASKA GAS, LLC

Date: June 1, 2020

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DIRECT TESTIMONY OF DOUGLAS N. HYATT

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Douglas N. Hyatt. My business address is 1515 Arapahoe Street, Tower 1, Suite 1200, Denver, CO 80202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Black Hills Service Company, LLC ("BHSC" or "the Company"), d/b/a Black Hills Energy. I am a Principal Regulatory and Finance Analyst.

BH Nebraska Gas is a wholly owned subsidiary of Black Hills Utility Holdings, Inc. ("BHUH"). BHUH is a wholly owned subsidiary of Black Hills Corporation ("BHC"). BHSC is a wholly owned subsidiary of Black Hills Corporation ("BHC").

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of BH Nebraska Gas. BH Nebraska Gas is the natural gas utility resulting from the recent consolidation of the Nebraska gas utility assets and operations of BHC's two former Nebraska gas utility distribution subsidiaries, Black Hills/Nebraska Gas Utility Company, Inc. ("BH Gas Utility") and Black Hills Gas Distribution, LLC ("BH Gas Distribution").

1 **II. STATEMENT OF QUALIFICATIONS**
2

3 **Q. WHAT ARE THE DUTIES AND RESPONSIBILITIES OF YOUR**
4 **CURRENT POSITION?**

5 A. I am responsible for gathering, researching and analyzing customer billing data,
6 and other information to prepare analyses in support of internal analysis and
7 external regulatory reports and filings.

8 **Q. PLEASE OUTLINE YOUR EDUCATIONAL AND PROFESSIONAL**
9 **BACKGROUND.**

10 A. My education, employment history and professional experience is provided in
11 Exhibit No. DNH-1.

12 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

13 A. No.

14 **III. PURPOSE OF TESTIMONY**
15

16 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

17 A. The purpose of my testimony is to describe the data used and studies performed in
18 support of the Class Cost of Service Study ("CCOSS") and rate design sponsored
19 by Mr. Sullivan in his Direct Testimony. My testimony presents the data used and
20 studies performed in the following order:

- 21 1. Sponsor the billing determinants used in the CCOSS and rate design,
22 including:
23 • Present adjustments to billing determinants;

- 1 • Support the Company's proposed weather normalization
- 2 adjustment ("WNA") of volumes for heating by the Residential
- 3 and Commercial customer classes;
- 4 • Describe the steps taken to develop weather normalized billing
- 5 determinants in terms for the proposed customer classes;
- 6 2. Sponsor the Company's Test Year billing determinants and
- 7 revenues under current rates;
- 8 3. Sponsor the customer class load factor analysis; and
- 9 4. Sponsor the revenue proofs.

10 **Q. ARE YOU SPONSORING ANY EXHIBITS OR SCHEDULES?**

11 A. Yes. I am sponsoring the following exhibits included within the documents

12 comprising Exhibit No. 1 of the Application:

13 **Section 3 - Exhibit A - Base Year Billing Determinants and Revenues by**

14 Company

15 **Section 3 – Exhibit B - Summary of Revenue Adjustments**

16 **Section 3 – Exhibit C Test Year Billing Determinants**

17 In addition, I sponsor the following testimony Exhibits:

18 **Exhibit No. DNH-1** Summary of my education, employment history and

19 professional experience.

20 **Exhibit No. DNH-2** Summary of Weather Normalization Statistical

21 Results

22 **Exhibit No. DNH-3** Base Year Weather Normalization Adjustment

23 **Exhibit No. DNH-4** Customer Growth Adjustment

24 **Exhibit No. DNH-5** Agricultural Normalization Adjustment

1 **Exhibit No. DNH-6 Load Factor Analysis**

2 **Exhibit No. DNH-7 – Revenue Proof**

3 **Q. HAVE THE TESTIMONY AND EXHIBITS THAT YOU ARE**
4 **SPONSORING BEEN PREPARED BY YOU OR UNDER YOUR**
5 **SUPERVISION?**

6 A. Yes.

7
8 **IV. BILLING DETERMINANTS AND REVENUES UNDER THE**
9 **PROPOSED CUSTOMER CLASSES AND CURRENT RATES**

10
11 **Q. PLEASE DESCRIBE WHAT IS MEANT BY THE TERM BILLING**
12 **DETERMINANTS.**

13 A. Billing determinants include number of therms used to calculate a customer's bill,
14 as well as the number of customer bills. The billing determinants are used in the
15 allocation of costs to each customer class in the CCOSS sponsored by Mr. Sullivan.
16 The billing determinants by usage tier, as determined in the Residential and
17 Commercial bill frequency studies below, are used in the development of rates
18 sponsored by Mr. Sullivan.

19 **Q. IS REVENUE REQUIRED IN ORDER FOR THE CCOSS TO DETERMINE**
20 **COST-BASED RATES?**

21 A. No. Customer revenues are not required for the functionalization and allocation of
22 costs performed in the CCOSS. Revenue is used in the Revenue Requirement Study
23 sponsored by Mr. Clevinger in the development of the revenue requirement and
24 revenue deficiency.¹ If the revenue shown in Exhibit C was set to zero, it would

¹¹ The Revenue Requirement Study is Application Exhibit No. 1, Section 2.

1 have no effect on the resulting cost-based rates developed in the CCOSS sponsored
2 by Mr. Sullivan.

3 **Q. HAVE YOU PREPARED A SUMMARY OF BASE YEAR BILLING**
4 **DETERMINANTS AND REVENUES BY CUSTOMER CLASS?**

5 A. The billing determinants reflected in Exhibit No. 1, Section 3, Exhibit A of the
6 Application show the base year billing determinants and base rate revenues for the
7 current customer classes including several adjustments. Section 1 of Application
8 Exhibit No. 1, Section 3, Exhibit A details the billing determinants and base rate
9 revenues for BH Gas Utility, and Section 2 details the same for BH Gas
10 Distribution. The Jurisdictional customer classes reflect the current customer
11 classes, and the Non-Jurisdictional customer classes generally follow how the
12 Company has previously classified these customers.

13 **Q. PLEASE DESCRIBE HOW COMMERCIAL ENERGY OPTIONS**
14 **CUSTOMERS ARE DIFFERENT, AND HOW THE BILLING**
15 **DETERMINANTS AND REVENUES ARE SHOWN.**

16 A. As described in the tariff, the Energy Options Program is available for the delivery
17 of natural gas owned by the Customer from Company's Town Border Station(s) to
18 a meter location on the Customer's premise. Energy Options customers use the
19 Company's system in the same manner as other customers in the same class.

20 They are charged the same base rates as Commercial customers in the same
21 class. The billing determinants for these customers are shown separately from the
22 other customers in the same customer class as shown in Section 1 of Application
23 Exhibit No. 1, Section 3, Exhibit A.

1 **Q. HAS BH NEBRASKA GAS INCLUDED A NEW CUSTOMER CLASS FOR**
2 **RENEWABLE NATURAL GAS PRODUCERS?**

3 A. Yes. Two large non-Jurisdictional industrial customers that produce renewable
4 natural gas have been added to the BH Gas Utility system since the last rate review.
5 As shown on Row 12 of Section 1 of Exhibit No. 1, Section 3, Exhibit A,
6 “Negotiated Supply” is a new non-jurisdictional customer class for two customers
7 that use the system in a different manner than other customer classes. The customer
8 bills and Therms for these two High Volume customers are not included in the
9 billing determinants, while the revenues are included. Gas delivered to one of these
10 customers is captured in other customer classes, while the revenues generated from
11 the use of the system to transport their supply of gas are reflected in revenues.

12 **Q. PLEASE DESCRIBE WHAT ADJUSTMENTS HAVE BEEN MADE TO**
13 **BASE YEAR BILLING DETERMINANTS AND REVENUES SHOWN IN**
14 **APPLICATION EXHIBIT NO. 1, SECTION 3, EXHIBIT A.**

15 A. Adjustments to billing determinants and revenue are necessary to arrive at just and
16 reasonable rates. The adjustments made by the Company to the Base Year billing
17 determinants and revenues were made to account for customer bill credits issued
18 during the Base Year, but which actually related to periods prior to the Base Year.

19 The detailed customer bill credit information was obtained from the
20 Company’s customer information billing system. If the customer bill credit
21 information is not properly adjusted for prior periods, then the net effect of not
22 making that adjustment would result in a significantly lower number of therms in
23 the billing determinants. BH Nebraska Gas removes the prior period billing

1 adjustments so the total therms used for setting rates is not artificially low, with the
2 result of setting the Residential and Commercial volumetric rates too high.

3 Accordingly, BH Nebraska Gas used detailed customer billing records to
4 adjust the billing determinants and revenues to reflect actual customer billings.
5 However, to provide for an accurate representation of billing determinants and
6 revenues, BH Nebraska Gas excluded the following customer billing adjustments
7 from the billing determinants and revenues:

8 a) Large billing credits issued to correct an error in the sales base
9 pressure used in the determination of the number of therms billed to
10 customers of BH Gas Utility. The credits were primarily issued
11 during the months of April, May, and June of 2019. The bill credit
12 refunds issued to these customers covered a period of up to
13 48 months.

14 b) Credits for the Tax Cuts and Jobs Act in Application Nos. NG-
15 0095.2 and NG-0095.3.

16 c) Credits for billing of the BH Gas Utility Pipeline Replacement
17 Charge in Application No. NG-0074.1.

18 d) Six specific BH Gas Distribution Large Commercial customers are
19 being reclassified from the current Large Commercial class to the
20 non-Jurisdictional Maximum Rate class, which will become
21 effective June 1, 2020. The billing determinants have been adjusted
22 to reflect the movement of these customers from the proposed
23 Jurisdictional Commercial class to the non-Jurisdictional Maximum
24 Rate class.

1 Inclusion of the billing credits identified above would not be appropriate to
2 the calculation of rates in this proceeding.

3 **Q HAVE YOU PREPARED A SUMMARY OF BILLING DETERMINANTS**
4 **REFLECTING THE ADJUSTMENTS DESCRIBED ABOVE?**

5 A. Yes. The adjustments to the Base Year billing determinants are reflected in the
6 number of customer bills and terms as shown in Exhibit No. 1, Section 3,
7 Exhibit C of the Application. Specifically, lines 2 and 3 of Application Exhibit
8 No. 1, Section 3 show the number of bills for each customer class Base Year plus
9 Energy Options, and lines 8 and 9 show the total terms.

10 **Q. HAVE YOU PREPARED A SUMMARY OF REVENUES REFLECTING**
11 **THE ADJUSTED BASE RATE REVENUES?**

12 A. Yes. Application Exhibit No. 1, Section 3, Exhibit B, lines 1 through 4 summarize
13 the Base Year, Customer Revenue Adjustments for prior period billing adjustments,
14 Customer Class Realignment showing the effect of the reclassification of the Large
15 Commercial customers to the Maximum Rate class, and the total Adjusted Revenue
16 (Base Year) as shown on line 4.

17 **Q. PLEASE DESCRIBE WHY THE DETERMINANTS AND BASE**
18 **YEAR/BASE RATE REVENUES ARE SHOWN BY COMPANY.**

19 A. Consistent with the commitment made by BH Nebraska Gas in
20 Application No. NG-100, the Base Year billing determinants and revenues are
21 shown at a summary level for BH Gas Utility and BH Gas Distribution.² However,

² The Test Year for this rate review is derived by taking the Base Year and adjusting it for known and measurable changes, as well as applying normalization adjustments, as required by the Act, and an annualized adjustment to correct for out-of-period billing entries. The raw data for determining a more detailed CCOSS is provided in the workpapers of Douglas N. Hyatt.

BH Nebraska Gas proposes to consolidate its rates on a statewide basis in this proceeding. Accordingly, BH Nebraska Gas also provides the billing determinants and revenues, shown as totals, for BH Nebraska Gas in Application Exhibit No. 1, Section 3, Exhibit C.

V. HEATING WEATHER NORMALIZATION ADJUSTMENT

Q. WHAT SPECIFIC INFORMATION IS BH NEBRASKA GAS COMMITTED TO PROVIDE IN ITS DIRECT CASE TO COMPLY WITH THE COMMISSION'S ORDER IN APPLICATION NO. NG-0067?

A. Weather Normalization. On pages 14 and 15 of the Commission's Order in Application No. NG-0067, the Commission stated as follows:

The Commission is satisfied with the normalization adjustment and methodology utilized by the Company in this rate proceeding. However, the Commission finds jurisdictional utilities should be mindful in future proceedings, of the methods and procedures utilized by a company to select and apply weather data, especially when data from some weather stations in the service area are missing or incomplete. The technical process of selection and application of weather data has the potential bias, particularly when matching regional weather to load data for weather normalization. Utilities should consider providing sensitivity analyses or different alternatives that match weather station data and area-specific energy consumption. *BH Gas Distribution Order at p. 15.*

Q. HAS BH NEBRASKA GAS PROVIDED THE INFORMATION REQUIRED IN COMMISSION APPLICATION NO. NG-0067 AS PART OF ITS DIRECT CASE IN THIS RATE REVIEW PROCEEDING?

A. Yes. The testimony below addresses how weather normalization is applied in this BH Nebraska Gas rate review application.

1 **Q. PLEASE DESCRIBE THE RATIONALE FOR ADJUSTING VOLUMES TO**
2 **REFLECT NORMAL WEATHER CONDITIONS.**

3 A. Because proposed rates are based on Test Year ³ volumes, those volumes should be
4 adjusted to reflect sales expected in a "normal" (typical) year. Assuming all other
5 factors are equal, if rates are based upon volume levels that are inflated due to
6 colder-than-normal weather (for example), the rates will be set too low and will
7 only recover costs during similar periods of colder-than-normal conditions.
8 Similarly, if weather is warmer-than-normal, rates will be set too high and will over
9 recover costs. Thus, if Test Year weather conditions deviate from normal, it is
10 necessary to adjust heating load to recognize what volumes would have been if
11 conditions were normal.

12 Traditionally, warmer- or colder-than-normal weather is based on a
13 comparison of actual heating degree-days during a Test Year to the heating degree-
14 days that would be expected during a normal or typical year.

15 **Q. PLEASE DEFINE A HEATING DEGREE-DAY.**

16 A. A heating degree-day ("HDD") is calculated by subtracting the average daily
17 temperature from 65 degrees Fahrenheit. Average daily temperature equals the
18 average of the high and low temperatures on each day. In the gas industry,
19 65 degrees Fahrenheit is commonly used for this calculation as the base
20 temperature because it is assumed that when average daily temperatures reach a
21 level below 65 degrees, heat sensitive customers will turn their heaters on for space
22 heating. If the average daily temperature exceeds 65 degrees, the HDD for that day

³ Additional adjustments are made to the Base Year billing determinants and revenue. The result is the Test Year billing determinants ended December 31, 2020.

1 is set equal to zero. The sum of the daily HDDs for a particular month is the monthly
2 HDDs. Below is how HDDs are calculated.

3 Maximum (high) Temperature = A Fahrenheit

4 Minimum (low) Temperature = B Fahrenheit

5 The sum of A and B is C.

6 C divided by 2 is D.

7 $65 - D = \text{HDDs}$.

8 **Q. WHY ARE YOU CALCULATING NORMAL HDDs USING A 10-YEAR**
9 **AVERAGE?**

10 A. Historically, the National Oceanographic and Atmospheric Administration
11 ("NOAA") publishes 30-year normal HDDs once every ten years. The most
12 recently published NOAA normal HDDs were for the period 1981-2010. This time
13 period is stale and does not even overlap the time period used by the Company in
14 this case to develop the class load and weather relationships.

15 The use of the most recent 10-year period to determine normal HDDs
16 achieves two goals. First, it is using the most recently available data and covers the
17 analysis time period used by the Company to develop class load and weather
18 relationships. Second, use of a 10-year period provides a reasonable balance
19 between using a sufficiently long period of time to capture both warmer and colder
20 conditions and giving recognition to the fact that the more recent past is generally
21 a better predictor of the near future. Rarely are rates approved in a rate case in effect
22 for 10 years or more and usually rates are changed much more frequently.

1 In addition, the ten (10) year period is consistent with the period approved
2 by the Commission in Application No. NG-0061 (BH Gas Utility Rate Review).⁴

3 **Q. WHAT VOLUME AND CUSTOMER DATA HAS THE COMPANY USED**
4 **FOR THE CALCULATION OF THE WEATHER NORMALIZATION**
5 **ADJUSTMENTS?**

6 A. The Company used detailed historical billing records by customer class and rate
7 schedule for the period of January 2010 through December 2019 as the source for
8 monthly volumetric (usage) and customer data used for the calculation of the
9 weather normalization adjustment.

10 **Q. PLEASE DESCRIBE THE WEATHER DATA YOU UTILIZE FOR YOUR**
11 **ANALYSIS.**

12 A. BH Nebraska Gas uses monthly actual HDD data as published by the NOAA for
13 weather stations in the following towns in Nebraska: Atkinson, Broken Bow,
14 Cambridge, Gordon, Hastings, Kearney, Lincoln, Norfolk, North Platte, Omaha,
15 Scottsbluff, and Sidney. Data from the weather station at the Sioux City, Iowa
16 airport was used for customers in the northeast area of Nebraska. The primary
17 consideration in my selection of these weather stations was to select NOAA stations
18 that are in close geographic proximity to the Company's load centers (the towns the
19 Company serves). The intent of BH Nebraska Gas is to group the towns around
20 NOAA weather stations where one would expect weather conditions (HDDs) to be
21 similar based on geographic proximity. BH Nebraska Gas reviewed the location of
22 the weather stations in relationship to its communities to ensure that the use of those

⁴ See, e.g., *Testimony of Dr. Livzey in Commission Application No. NG-061 (BH Gas Utility Rate Proceeding)*.

1 weather stations is appropriate. In addition, the assignment of weather stations to
2 the communities is also consistent with the weather data used by BH Nebraska Gas
3 in providing natural gas and transportation services to its customers. The weather
4 stations used are the same weather stations that were approved in prior rate cases
5 for BH Gas Utility and BH Gas Distribution to establish currently effective base
6 rates. BH Nebraska Gas is basing normal HDDs for the locations indicated above
7 on the monthly average HDDs for the 10-year period ending December 31, 2019.

8 **Q. WERE ACTUAL HEATING SEASON WEATHER CONDITIONS IN THE**
9 **COMPANY'S SERVICE TERRITORY FOR THE 12-MONTH PERIOD**
10 **ENDING DECEMBER 31, 2019 NORMAL?**

11 A. No, generally they were not. Based on a comparison of actual 2019 HDDs to normal
12 HDDs for the 10-year period ending December 31, 2019, conditions were colder
13 than normal. Table DNH-1 below summarizes conditions at the 13 weather stations
14 that BH Nebraska Gas used in this proceeding:

15 **Table DNH-1: Actual and Normal HDDs**

| Weather Station | 2019 Actual Heating Degree Days | 10 Year Normal Heating Degree Days | Percent Colder than Normal |
|------------------------|--|---|-----------------------------------|
| Atkinson | 7,761 | 6,790 | 13% |
| Broken Bow | 7,670 | 6,872 | 10% |
| Cambridge | 6,815 | 6,119 | 10% |
| Gordon | 8,414 | 7,348 | 13% |
| Hastings | 6,654 | 6,064 | 9% |
| Kearney | 6,834 | 6,272 | 8% |
| Lincoln | 6,365 | 5,905 | 7% |
| Norfolk | 7,122 | 6,528 | 8% |
| North Platte | 6,954 | 6,449 | 7% |
| Omaha | 6,311 | 5,854 | 7% |
| Scottsbluff | 6,988 | 6,319 | 10% |
| Sidney | 7,092 | 6,322 | 11% |
| Sioux City | 7,337 | 6,664 | 9% |

1 These deviations are significant enough that BH Nebraska Gas concluded a heating
2 adjustment to reflect normal weather conditions was warranted.

3 **Q. HAVE YOU COMPARED THE 2019 ACTUALS TO OTHER PERIODS?**

4 A. Yes. A comparison of actuals to normal based upon rolling periods of 15, 20, 25,
5 and 30 years of NOAA HDD's has been reviewed, and shows that 2019 was
6 generally colder than all of these periods, and would therefore produce similar net
7 results when looked at on a statewide basis.⁵ As noted above, comparison to the
8 ten (10) year weather period is appropriate because, among other reasons, that
9 period is consistent with prior Commission approval of the 10-year period.

10 **Q. PLEASE SUMMARIZE THE METHODOLOGY USED TO DETERMINE**
11 **THE RELATIONSHIP BETWEEN USAGE AND WEATHER.**

12 A. The Company used multiple linear regression analyses to define the relationship
13 between volumes and variables that represent weather conditions. Multiple linear
14 regression is a statistical approach commonly used to predict the value of a
15 dependent variable (use per customer) using multiple independent variables
16 (including current month HDDs and previous month HDDs). In this regard, the goal
17 is to explain the dependent variable with reasonable accuracy using as few
18 independent variables as possible.

19 Multiple regression yields an equation of the form:

20
$$Y = B + A_1X_1 + A_2X_2 + \dots + A_KX_K$$

21 where

22 Y is the dependent variable

⁵ The NOAA tables providing data for each of the different periods is provided in the work papers of Douglas N. Hyatt.

1 B is the y-intercept (or constant)

2 $X_1...X_K$ are the independent variables

3 $A_1...A_K$ are the regression coefficients

4 With respect to the Company's use of multiple linear regression as a tool in
5 developing adjustments to reflect normal weather conditions, the dependent
6 variable (Y) is monthly use per customer and is calculated by dividing monthly
7 volumes by monthly number of customers. Monthly use per customer is used as the
8 dependent variable instead of total monthly volumes because use per customer
9 reduces the effect of growth or decline in total volumes due to changes in numbers
10 of customers. Independent variables ($X_1...X_K$) are typically weather variables such
11 as HDDs. The intercept (B) is a monthly constant. The constant represents usage
12 that is not affected by the independent variables. The coefficients ($A_1...A_K$) are
13 developed from the regression analysis based on the best fit (least squares).

14 The Company calculates several statistics in connection with the regression
15 analyses to assist in the evaluation of the significance (degree to which the
16 independent variables explain the dependent variable) of the various variables in
17 explaining use per customer.

18 **Q. IS THIS THE SAME METHODOLOGY USED BY THE COMPANY IN**
19 **THE LAST RATE REVIEW FILINGS?**

20 A. Yes. This is the same methodology used in the last three Source Gas Distribution
21 rate reviews, and the last three BH Gas Utility rate reviews.⁶ These six rate review

⁶ See, Commission Application Nos. NG-0001,0002, and 0003 (Aquila, Inc.); Commission Application Nos. NG-0041 and NG-0061 (BH Gas Utility). See also, Commission Application No. NG-0036 (Kinder Morgan), Application Nos. NG-0060 (SourceGas), and Application No. NG-0067 (BH Gas Distribution).

1 proceedings constitute all the rate review applications filed by BH Gas Utility and
2 BH Gas Distribution with the Commission.

3 **Q. WHAT DATA DID THE COMPANY USE IN PERFORMING THE**
4 **MULTIPLE LINEAR REGRESSION ANALYSIS DESCRIBED ABOVE?**

5 A. The analysis was based on actual monthly use per customer (dependent variable),
6 and actual monthly HDDs (independent variables). The Company ran separate
7 regression analyses on each of the proposed customer classes (Residential and
8 Commercial). The regression analysis produced coefficients that the Company used
9 to determine use per customer per HDD.

10 **Q. FOR WHICH CUSTOMER CLASSES IS THE COMPANY PROPOSING TO**
11 **ADJUST VOLUMES?**

12 A. The Company is proposing to adjust volumes for those classes of customers where
13 it can be demonstrated that their usage is sensitive to changes in winter temperature
14 conditions. These classes of customers use natural gas primarily for space heating.
15 The variation in monthly HDDs typically explains most of the variation in volumes
16 used by customers who use natural gas in space heating applications. The customer
17 classes the Company is proposing to adjust are the Residential and Commercial
18 classes.

19 **Q. PLEASE DESCRIBE THE COMPANY'S WEATHER NORMALIZATION**
20 **REGRESSION RESULTS.**

21 A. In order to identify anomalies in usage patterns over the ten-year period, regression
22 analyses in decreasing blocks of time (January 2010 - December 2019, January
23 2011 - December 2019, January 2012 - December 2019, etc.) were performed for
24 each of the customer classes. Exhibit No. DNH-3 summarizes the results of each of

1 the regression analyses. The Company evaluated the results of each of these time
2 periods using four criteria to determine which period should be used to define usage
3 characteristics. These four criteria are as follows:

- 4 1. Consistency of predicted normal use per customer;
- 5 2. Average annual HDDs for the period evaluated being near
6 normal;
- 7 3. R squared - values in the 90% range are common; and
- 8 4. Obvious changes as reflected in coefficients and statistics.

9 Exhibit No. DNH-2 shows which regression analysis the Company chose for each
10 customer class. In all cases, the Company selected the ten-year period from
11 January 2010 through December 2019. This time period satisfies the four criteria
12 identified above and closely aligns to the period used in the calculation of normal
13 HDDs. Based on these regression analyses, the Company concluded it is reasonable
14 to develop a heating volume adjustment for all the customer classes previously
15 identified.

16 **Q. HOW DID THE COMPANY DETERMINE THE HEATING VOLUME**
17 **ADJUSTMENT APPLICABLE TO THE RESIDENTIAL AND**
18 **COMMERCIAL CUSTOMER CLASSES?**

19 A. This calculation is summarized in Exhibit No. DNH-3 Base Year Weather
20 Normalization Adjustment. The heating adjustment per customer is the difference
21 between normal and actual HDDs multiplied by its respective HDD coefficients
22 (current and prior months) for each month of the Base Period. The heating

1 adjustment is determined using coefficients from Exhibit No. DNH-2 and the ten-
2 year average HDD data shown in Exhibit No. DNH-3.

3 After the monthly heating adjustment per customer (i.e., therm/customer)
4 was calculated, the respective number of customers for each month of the Base
5 Period was multiplied by each of these figures to determine the total volumetric
6 adjustment. As shown in Exhibit No. DNH-3, the Company's heating adjustment
7 represents a decrease in sales of 15,129,988 therms for Residential customers, and
8 (9,232,002) therms for Commercial customers, for a total heating adjustment of
9 (24,361,990) therms. These adjustments result in a decrease in Base Year volumes,
10 which is consistent with actual conditions being colder than normal during the Base
11 Year.

12 **Q. HOW DID THE COMPANY DETERMINE THE WEATHER**
13 **NORMALIZATION REVENUE ADJUSTMENTS?**

14 A. The volumetric WNA adjustments shown in Exhibit No. DNH-3, are detailed by
15 Company, customer class and by weather station. For each customer class, the
16 margin adjustment is determined by multiplying the weather normalization volume
17 times the appropriate margin rate. These adjustments result in a decrease in Base
18 Year revenues which is consistent with the conditions being colder than normal
19 during the Base Year.

20 **VI. TEST YEAR BILLING DETERMINANTS UNDER CURRENT**
21 **RATES AND CURRENT CUSTOMER CLASSES**
22

23 **Q. PLEASE DESCRIBE THE DIFFERENCE BETWEEN THE BASE YEAR**
24 **BILLING DETERMINANTS DESCRIBED ABOVE AND THE TEST YEAR**
25 **BILLING DETERMINANTS UNDER CURRENT RATES.**

1 A. Additional adjustments are made to the Base Year billing determinants and revenue.
2 The result is the Test Year billing determinants ended December 31, 2020. The
3 additional adjustments include the weather normalization adjustment discussed
4 above, the Jurisdictional Sales customer growth adjustment, adjustments to
5 revenues for base rate changes made to riders after the Base Year, and an adjustment
6 in the total number of therms for agricultural customers.

7 **Q. PLEASE DESCRIBE THE CUSTOMER GROWTH ADJUSTMENT.**

8 A. The customer growth as detailed in Exhibit No. DNH-4, shows an estimated
9 customer growth adjustment of an additional of 2,137 Residential customers and
10 233 Commercial customers. The customer growth adjustment is based upon the
11 trend of the average number of customers for both the Residential and Commercial
12 customer classes over the five calendar years ending December 31, 2019, as shown
13 in Exhibit No. DNH-4. The customer growth adjustment detailed in
14 Application No. 1, Section 3, Exhibit C is based on the following categories:

- 15 1. Monthly bills (Line 4);
- 16 2. Therms, normalized for weather (Line 13);
- 17 3. Gas Cost Revenue (Line 44);
- 18 4. Volumetric Charge Revenue (Line 53);
- 19 5. Monthly Charge Revenue (Line 68); and
- 20 6. Total Margin Revenue (Line 79).

21 The customer growth adjustment that relies on the information under these
22 categories is used in the CCOSS.

23 **Q. CAN YOU DESCRIBE HOW THE RESIDENTIAL AND COMMERCIAL**
24 **CUSTOMER GROWTH ADJUSTMENT WAS CALCULATED?**

1 A. Yes. The projected growth in the Residential number of bills and therms for the Test
2 Year is reflected in the billing determinants for Rate Areas One, Two, and Three
3 (former BH Gas Utility) and Rate Area Five (former BH Gas Distribution). The
4 growth in the number of therms is calculated by multiplying the average number of
5 therms used by current residential customers by the projected number of additional
6 bills. The number of therms for the winter and summer seasons are calculated by
7 multiplying the average therms per bill for current customers by the projected
8 number of additional bills in each season. The number of customer bills and therms
9 are used to calculate the additional gas cost, volumetric, and monthly charge
10 revenue for Rate Areas One, Two, and Three (former BH Gas Utility) and Rate Area
11 Five (former BH Gas Distribution).

12 **Q. PLEASE DESCRIBE THE STEPS TAKEN TO ADJUST THE TEST YEAR**
13 **BILLING DETERMINANTS FOR CURRENT BASE RATES.**

14 A. The adjusted Base Year billing determinants described above are the basis from
15 which the Test Year billing determinants have been developed. To adjust revenues
16 to current rates based upon the weather normalized billing determinants, the
17 following adjustments have been made to base rate revenues:

- 18 1. BH Gas Utility Pipeline Replacement Adjustment, as shown on Line 7 of
19 Application Exhibit No. 1, Section 3, Exhibit B, and Line 69 of Application
20 Exhibit No. 1, Section 3, Exhibit C;
- 21 2. BH Gas Distribution Safety and Integrity Rider (SSIR), as shown on Line 8
22 of Application Exhibit No. 1, Section 3, Exhibit B, and Line 70 of
23 Application Exhibit No. 1, Section 3, Exhibit C;

1 3. BH Gas Utility Fuel Line Replacement Adjustment, as shown on Line 9 of
2 Application Exhibit No. 1, Section 3, Exhibit B, and Line 71 of Application
3 Exhibit No. 1, Section 3, Exhibit C.

4 **Q. PLEASE EXPLAIN THE RATIONALE FOR ADJUSTING**
5 **AGRICULTURAL VOLUMES TO REFLECT NORMAL CONDITIONS.**

6 A. The Company is proposing to adjust agricultural volumes to reflect normal
7 conditions. Similar to the weather normalization adjustment, the intent of
8 this adjustment is applied so that Test Year volumes reflect sales that would
9 be expected in an otherwise “normal” or typical year.

10 **Q. DURING THE BASE YEAR, WERE AGRICULTURAL VOLUMES**
11 **NORMAL?**

12 A. No. Exhibit No. DNH-5, Line 5 shows that for the Base Year, agricultural
13 volumes were lower than they were for the previous four years. Based on
14 this low usage level, the Company concluded that an adjustment to
15 agricultural sales volumes was necessary.

16 **Q. FOR PURPOSES OF THE COMPANY’S PROPOSED**
17 **AGRICULTURAL ADJUSTMENT, HOW IS NORMAL DEFINED?**

18 A. The Company defines normal as the five-year average usage from
19 January 2015 through December 2019 using the same methodology as was
20 performed in Commission Application No. NG-0067.

21 **Q. HOW DID THE COMPANY CALCULATE THE AGRICULTURAL**
22 **ADJUSTMENT FOR THE BASE YEAR ENDED**
23 **DECEMBER 31, 2019?**

1 A. First, the Company calculated the five-year average therms for the
2 agricultural customers, Exhibit No. DNH-5, Line 7. The Company used this
3 five-year average as the basis for “normal.” Next, the difference between
4 the five-year average therms and the actual Base Year therms was
5 calculated, Exhibit No. DNH-5, Column C, Line 10. This results in a total
6 volumetric adjustment of 10,803,938 therms.

7 **Q. ONCE THE TOTAL VOLUMETRIC ADJUSTMENT WAS**
8 **DETERMINED, HOW DID THE COMPANY ALLOCATE THIS**
9 **ADJUSTMENT INTO THE TIERS USED FOR BILLING?**

10 A. The first tier of the agricultural rates (first 1,000 therms) is the baseload
11 usage for agricultural customers. Since the agricultural adjustment is based
12 on conditions not being normal (i.e., other than baseload), the adjustment
13 was allocated to the second and third tiers based on the percentage of
14 volumes that were billed in those tiers in the Base Year, respectively.

15 **Q. HAS THE COMPANY CALCULATED THE MARGIN IMPACT OF**
16 **THE PROPOSED AGRICULTURAL ADJUSTMENT?**

17 A. Yes, Lines 20 and 21 of Exhibit No. DNH-5 show the Company’s proposed
18 margin adjustment to the Base Year Agricultural customer revenue of
19 \$2,164,749. This is the same margin adjustment that is shown on Lines 54
20 and 83 of Application Exhibit No. 1, Section 3, Exhibit C. The importance
21 of this adjustment is that without it, the Total State revenue deficiency
22 would be \$2,164,749 higher.

23

VII. LOAD FACTOR STUDY

Q. PLEASE DEFINE A LOAD FACTOR.

A. In the context in which the Company is using it, the load factor is defined as the customer class' average daily use divided by its peak day use. It is a measure of how effectively a customer class utilizes the capacity needed to serve it. For example, if one customer class has a load factor of 25%, meaning that its average daily use is 25% of its peak day use, and another customer class has a load factor of 50%, meaning that its average daily use is 50% of its peak day use, then the second class is utilizing the capacity required to serve that class twice as effectively as the first class.

Q. HOW IS THE LOAD FACTOR USED?

A. The Company uses customer class load factors in its CCOSS to determine the peak day requirements used for the peak day allocation. The load factors used by the Company are shown on Exhibit No. DNH-6 for the Residential, Commercial, Maximum Rate, and Negotiated Distribution customer classes. The actual measured maximum daily demand was used for the Negotiated Transmission customer class.

Q. PLEASE EXPLAIN HOW THE LOAD FACTORS FOR THE RESIDENTIAL AND COMMERCIAL CUSTOMER CLASSES WERE CALCULATED.

A. In Exhibit No. DNH-6, the load factors for the Residential and Commercial customer classes were developed by using the HDD statistical results, the normal heating degree days to develop load factors that were used in conjunction with the billing determinants to develop weighted load factors for each class. For example,

1 the 23.21% load factor for the Residential customer class (Line 16 of
2 Exhibit No. DNH-6), and 24.00% for the Commercial class (Line 31 of
3 Exhibit No. DNH-6) are the figures used in the Company's CCOS.

4 **VIII. DEVELOPMENT OF THE REVENUES UNDER COST-BASED**
5 **AND PROPOSED RATES**

6 **Q. PLEASE DESCRIBE HOW YOU DEVELOPED THE REVENUES UNDER**
7 **COST-BASED AND PROPOSED RATES.**

8 A. The revenue under cost-based, proposed and alternate rates, were developed using
9 the Test Year billing determinants shown in Application Exhibit No. 1, Section 3,
10 Exhibit B and the cost-based, proposed and alternate rates for the Residential and
11 Commercial customer classes as shown in Exhibit No. TJS-7 and described by
12 Mr. Sullivan in his Direct Testimony.

13 The revenues under cost of service base rates are shown in Section 7, and
14 revenue deficiency in Section 9, of Exhibit No. DNH-7. The revenues are based
15 upon the billing determinates shown in Sections 1 & 2 of Exhibit No. DNH-7 and
16 the cost of service rates shown in Section 2 of Exhibit No. TJS-7.

17 The revenues under proposed rates are shown in Section 11, and revenue
18 deficiency in Section 13 of Exhibit No. DNH-7. The revenues are based upon the
19 billing determinates shown in Sections 1 & 2 of Exhibit No. DNH-7 and the
20 proposed rates shown in Section 3 of TJS-7.

21
22 **IX. CONCLUSION**

23 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

24 A. Yes.

STATE OF NEBRASKA)
) SS
COUNTY OF LANCASTER)

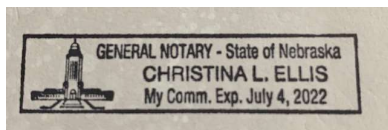
I, Douglas N. Hyatt, being first duly sworn on oath, depose and state that I am the witness identified in the foregoing prepared testimony and I am familiar with its contents, and that the facts set forth are true to the best of my knowledge, information and belief.



Douglas N. Hyatt

Subscribed and sworn to before me this 27th day of May, 2020.

(SEAL)



Notary Public

My Commission Expires:
July 4, 2022