

MONTANA-DAKOTA UTILITIES CO.

Before the North Dakota Public Service Commission

Case No. PU-20-____

Direct Testimony
of
Matthew T. Shoemake

1 **Q. Would you please state your name and business address?**

2 A. Yes. My name is Matthew T. Shoemake, and my business address
3 is 400 North Fourth Street, Bismarck, North Dakota 58501.

4 **Q. What is your position with Montana-Dakota Utilities Co.?**

5 A. I am a Regulatory Analyst in the Regulatory Affairs Department for
6 Montana-Dakota Utilities Co. (Montana-Dakota) and Great Plains Natural
7 Gas Co. (Great Plains), herein referred to collectively as "Company."

8 **Q. Would you please describe your duties as a Regulatory Analyst?**

9 A. I assist in the preparation of the Company's monthly purchase gas
10 adjustment filings, weather normalization of volumes, assist in monthly
11 fuel cost adjustment filings, and other filings required by state
12 commissions.

13 **Q. Would you please describe your education and professional
14 background?**

15 A. I graduated from Texas A&M University in College Station, Texas
16 with a Bachelor of Science degree in Economics with a minor in Business
17 Administration. I have been in my current position with Montana-Dakota

1 for 4 years. Prior to starting in my current role May of 2016, I was a
2 quality control analyst for Knife River, a subsidiary of MDU Resources, for
3 approximately 8 years.

4 **Q. Have you testified in other proceedings before regulatory bodies?**

5 A. Yes. I have previously presented testimony before this
6 Commission, the Public Service Commission of Montana, and the Public
7 Utilities Commission of Minnesota.

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

9 A. The purpose of my testimony is to present the methodology used
10 by the Company to forecast sales data, including weather normalized
11 volumes, projected volumes and projected customers. The totality of this
12 process and its results are the foundational basis for the underlying
13 projected sales and transportation revenues used in this rate case.

14 **Q. What statements, schedules and exhibits are you sponsoring?**

15 A. I am sponsoring the development of the forecasted billing units as
16 presented on Exhibit No. ____ (MTS-1 and MTS-2) and ultimately used in
17 the forecasted revenues on Statement F, Schedule F-1 pages 1 through
18 37. I am also sponsoring the regression models included in Workpapers
19 Statement F, Schedule F-1 pages 1 through 92.

20 **Q. Would you describe the development of the normalized volumes?**

21 A. Volumes for residential, firm general, propane, the Minot Air Force
22 Base and select interruptible and transportation customers were adjusted
23 to reflect normal weather patterns, where appropriate. Each of the

1 aforementioned customer classes was adjusted separately. Further, the
2 normalization models was separated between Montana-Dakota and Great
3 Plains which I will detail later in my testimony. Billing period sales volumes
4 and customers, by month, were the starting point for the data utilized in
5 the models.

6 First, customer classes were analyzed to determine whether natural
7 gas usage was associated with heating purposes and therefore correlated
8 with weather input from the Company's Gas Supply Department. The
9 general idea of heat-sensitivity is that some customers will increase the
10 amount of natural gas that they consume as the outside temperature
11 drops. Typically, this increase in consumption is cyclical with the calendar
12 – as fall and winter set in, natural gas volumes sold to customers tend to
13 increase. However, there are certain customers and instances in which
14 colder weather is not correlated with the amount of natural gas consumed
15 – these customers are considered non-heat-sensitive.

16 All firm service customer classes were determined to be heat-
17 sensitive. Interruptible and transportation customers were analyzed on an
18 individual basis and grouped into heat-sensitive and non-heat-sensitive by
19 each customer class.

20 **Q. How were the normalized volumes calculated for heat-sensitive**
21 **customers?**

22 A. For customer classes and individual customers that were
23 determined to be heat-sensitive, weather and billing data were

1 incorporated into a model using an Ordinary Least Squares (OLS)
2 regression for each respective class of service. To incorporate seasonal
3 weather patterns, billing period degree days based on a 60-degree day
4 were included as an input in the modeled regressions. Billing data used
5 as inputs in the model were the monthly distinct count of customers and
6 the actual dekatherms of gas consumed. The time period for each
7 customer class in the modeled regressions was 36 months, or 3 years.

8 The structured equation for the OLS models used for heat-sensitive
9 customers is as follows:

$$10 \quad y = b_0 + b_1x_i$$

11 Where, y is the natural gas volumes consumed in a month, b_0 is the
12 daily baseload, b_1 is the use per degree day, and x_i is the number of
13 degree days per month.

14 Using the results of the regression analysis for residential and firm
15 general service customer classes, the daily baseload use per customer
16 (the intercept of the OLS) was multiplied by the respective number of days
17 in each calendar month to arrive at the monthly baseload use per
18 customer. The use per degree day per customer (the slope of the OLS)
19 was then applied to the normal billing period degree days (based on
20 normal weather for 30 years) to determine the normalized heating use per
21 customer. The Company has historically used 30-year normals for
22 weather normalization purposes and believes that using a 30-year normal
23 weather is most appropriate to capture historical weather trends. The

1 results of each of these equations was then combined by the number of
2 customers in each respective month to determine the normalized usage
3 for the twelve months ended December 31, 2019.

4 **Q. How were the normalized volumes calculated for non-heat-sensitive**
5 **customers?**

6 A. For customers that were determined to be non-heat-sensitive,
7 simple averages of historical consumption patterns were utilized. These
8 averages are considered to be the normalized volumes for the non-heat-
9 sensitive customers. These averages were calculated at an individual
10 customer level. For most non-heat customers, a 36-month average was
11 calculated (January 2017 – December 2019). In some instances, either a
12 24-month average was calculated or a customer's per books consumption
13 for the most recent 12 months was used. In these cases, either there was
14 not enough historical data for the customer, or the customer cut in and out
15 of service and using longer periods of consumption was deemed
16 inappropriate.

17 **Q. Was any consideration given to customers which changed rate**
18 **classes?**

19 A. Yes. The Company analyzed the historical data for interruptible
20 and transportation customers that changed rate classes during the time
21 period in the data. During the time period of 2017 through 2019 there
22 were a number of customers that changed rates under which they took
23 service. In its normalization models and projections, the Company

1 ensured that customers were represented in the rate class in which they
2 are currently billed.

3 The Company also discussed internally with its field operations and
4 gas supply departments to determine if there were any foreseeable
5 changes to the classifications of its interruptible and transportation
6 customers. Any discussions or agreements with customers to change
7 their service rate or stop service altogether that were known at the time of
8 filing were incorporated within the forecasted sales data.

9 **Q. Were other considerations necessary for customers?**

10 A. Yes, the removal of select customers from Rate 71 was also
11 required. Due to the margin sharing adjustment for Montana-Dakota's
12 grain dryers through the purchased gas adjustment as authorized in Case
13 No. PU-13-803 and maintained in PU-15-90 and PU-17-295, all grain
14 drying customers were removed from the Company's normalized and
15 projected volumes. To further ensure the integrity of the projected
16 volumes, customers that were not active at the end of 2019 were
17 completely removed from the entirety of the underlying data for rate 71.

18 **Q. How were the projected volumes calculated for heat-sensitive**
19 **customers?**

20 A. The projected volumes were based upon the calculated normalized
21 volumes for each customer class. For the residential and firm general rate
22 classes, the Company applied projected customer growth to the
23 normalized volumes to obtain projected volumes. For other heat-sensitive

1 customers and classes, the projected volumes were set equal to the
2 normalized volumes as calculated and described previously.

3 **Q. How were the projected volumes calculated for non-heat sensitive**
4 **customers?**

5 A. The projected volumes for these customers were set equal to their
6 normalized volumes.

7 **Q. You previously mentioned calculating volumes and customers**
8 **independently for Montana-Dakota and Great Plains. Would you**
9 **describe how this affects the normalization models and projected**
10 **volumes?**

11 A. As has been described by Ms. Kivisto, Ms. Vesey and Ms. Bosch,
12 Montana-Dakota is proposing to incorporate Wahpeton, North Dakota,
13 currently provided for under the Great Plains North Dakota rate book, into
14 Montana-Dakota's North Dakota gas rate book. As this relates to the
15 normalization models and projected volumes, it is prudent and necessary
16 to calculate normalized and projected volumes for Wahpeton
17 independently of those calculated for Montana-Dakota. As an example,
18 Wahpeton residential volumes are calculated in a similar manner as those
19 of the rest of North Dakota's residential volumes, but they are calculated
20 independently using only residential customers, volumes and weather
21 data for Wahpeton.

22

1 **Q. How will the incorporation of Wahpeton into Montana-Dakota affect**
2 **future models and volumes?**

3 A. The models and volumes will remain separate in future rate cases
4 until said time that the billing phases are converged and separate rate
5 schedules for Wahpeton are no longer necessary. At that time, it is
6 expected that all North Dakota models and projections will be incorporated
7 into a single model for rate case purposes.

8 **Q. Would you describe the weather data utilized in developing weather**
9 **normalized gas sales?**

10 A. The Company purchases raw daily weather data from DTN. The
11 data utilized in the weather normalizations is the average temperature in
12 degrees Fahrenheit for areas of North Dakota that the Company provides
13 natural gas service in. The daily average temperature is compared to an
14 industry standard 60 (sixty) degrees Fahrenheit and if the temperature is
15 below 60 degrees, the difference is considered the degree day value. For
16 example, if the average daily temperature is 55 for March 1st, then the
17 amount of degree days is 5 (60-55=5). These temperatures are collected
18 from seven regional weather stations in North Dakota (Bismarck, Devils
19 Lake, Dickinson, Jamestown, Minot, Wahpeton and Williston) and the
20 differences for each day are considered calendar degree days. The data
21 from these individual weather stations are then weighted based upon
22 billing period cycles to match up with the Company's meter reads and
23 billing process. These calendar degree days for each respective area are

1 then weighted based upon the amount of historical number of bills that are
2 sent to customers in each respective billing period cycle to calculate a
3 billing period degree day (BPDD) for each of the six regions. For
4 Montana-Dakota, these regional BPDDs are then weighted based upon
5 the historical number of firm customer service points to calculate a
6 system-wide North Dakota BPDD. For Great Plains, the BPDD utilizes
7 only Wahpeton weather information.

8 **Q. Would you describe the methodology used to calculate customer**
9 **counts?**

10 A. The Company's Customer Care and Billing System (CC&B) was the
11 starting point for the development of the customer counts. A Microsoft
12 Excel file containing the service identification numbers (SA IDs) for each
13 rate class was extracted from CC&B. The method to determine customer
14 counts is a feature in Excel named Distinct Count, which counts the
15 number of unique values. The Count feature in Excel counts the total
16 number of values corresponding to a range of data, regardless if a specific
17 value has multiple entries in the data set. The Distinct Count feature has
18 been utilized by Montana-Dakota and Great Plains to determine its
19 customer counts in previous rate cases as it accounts for adjustments and
20 corrections to customer bills in the CC&B data set.

21

22

1 **Q. How were growth rates for customers for the projected years**
2 **calculated?**

3 A. A 3-year average growth rate for the Residential, Small Firm
4 General and Large Firm General was determined to be representative of
5 the growth expected for the future. For the remaining classes, no growth
6 was used so customer counts were left at their respective levels at the end
7 of 2019. Average growth rates were applied to the year-end 2019
8 customer counts for each rate to project 2020 and for 2020 to project
9 2021. The percentage of each rate's respective monthly customer counts
10 for 2019 were applied to each of the total projections for 2020 and 2021 to
11 obtain monthly customer projections that were used to determine
12 projected volumes based on the OLS models.

13 **Q. Does this complete your direct testimony?**

14 A. Yes, it does.