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April 28, 2010

VIA ELECTRONIC FILING

Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101

Re: In the Matter of the Petition of Minnesota Energy Resources Corporation–NMU for Approval of a Change in Demand Entitlement
Docket No. G007/M-09-1282

Dear Dr. Haar:

Enclosed please find the Reply Comments of Minnesota Energy Resources Corporation ("MERC") in response to the April 2, 2010 Comments of the Office of Energy Security ("OES") in the above-referenced docket.

MERC initially filed these Reply Comments on April 12, 2010, but was asked to resubmit the electronic filing due to technical error.

Thank you for your attention to this matter.

Sincerely yours,

/s/ Sarah J. Kerbeshian

Sarah J. Kerbeshian

cc: Service List

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April 12, 2010

VIA ELECTRONIC FILING

Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101

Re: In the Matter of the Petition of Minnesota Energy Resources Corporation–NMU for Approval of a Change in Demand Entitlement;
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Dear Dr. Haar:

Enclosed please find the Reply Comments of Minnesota Energy Resources Corporation ("MERC") in response to the April 2, 2010 Comments of the Office of Energy Security ("OES") in the above-referenced docket.

Thank you for your attention to this matter.

Sincerely yours,

/s/ Michael J. Ahern

Michael J. Ahern

cc: Service List

STATE OF MINNESOTA
BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

David C. Boyd	Chair
J. Dennis O'Brien	Commissioner
Thomas Pugh	Commissioner
Phyllis A. Reha	Commissioner
Betsy Wergin	Commissioner

In the Matter of the Petition of Minnesota Energy Resources Corporation-NMU for Approval of a Change in Demand Entitlement	Docket No. G007/M-09-1282

REPLY COMMENTS OF MINNESOTA ENERGY RESOURCES CORPORATION

Minnesota Energy Resources Corporation-NMU ("MERC" or "Company") submits to the Minnesota Public Utilities Commission ("Commission") these Reply Comments in response to the April 2, 2010 Comments of the Minnesota Office of Energy Security ("OES") in the above referenced matter.

A. Design-Day Requirements

Based on its review, the OES concluded that MERC conducted its design-day study using a statistically valid model, but the OES had concerns that the analysis may not be able to fully ensure system reliability on an all-time peak day. The OES noted that its primary concern relates to estimating peak-day firm sales throughput, which requires the Company to estimate daily interruptible and transportation customer use before estimating firm sales. Based on the OES's calculations, the OES noted that MERC-NMU's design-day calculations may not be sufficient to ensure peak day reliability on three of its pipeline systems: Great Lakes, Centra, and Northern. In particular, the OES observed that there was one day on the Great Lakes system, two days on the Centra system, and six days on the Northern system where estimated firm peak day sendout was greater than total pipeline system entitlements. Although the numbers of deficient days on

the Great Lakes and Centra systems were small, the OES noted that the estimated shortfalls on these days are quite large and indicate a possible issue in peak day calculations for these pipelines. Since the Company purchases Northern system entitlements for both MERC-NMU and MERC-PNG, the OES noted that it is possible that the peak day surpluses calculated in the MERC-PNG Northern demand entitlement could be used to balance the six days of deficient volumes calculated for MERC-NMU. The OES also pointed out that MERC is attempting to mitigate the design-day risk associated with interruptible and transportation customers by requiring gas meter telemetry.

The OES recommended that MERC provide the following information in its Reply Comments:

1. a full justification of the peak day calculations the Company used to procure total entitlements for the Great Lakes and Centra pipelines;
2. a full explanation of whether there are sufficient entitlements to serve MERC-NMU's Northern pipeline firm customers on a peak day;
3. a full explanation of how firm entitlements shift between MERC-NMU and MERC-PNG on the Northern pipeline system; and
4. a full discussion detailing how it intends to install telemetry for its transportation customers and an estimate of how long it will be before it has adequate daily data to estimate its firm design day more accurately.

The OES also noted that MERC's adjusted HDD calculation is different from the official calculation used by the National Weather Service. Given this difference, the OES recommended that MERC also provide it its Reply Comments:

5. a full discussion explaining why it uses a different calculation and what, if any, impact using the official wind chill calculation has on MERC's design-day forecast.

Response

1. Centra and Great Lakes Peak Day Calculations

MERC believes that the two days that OES notes on Centra's system as well as the one day on the Great Lakes System (over the last three winters) where OES's estimated peak day firm volumes appear to have exceeded firm entitlements are indicative of the need to incorporate daily metering for all non-firm customers into the peak day forecasting process. As explained below, when graphed in scatter plots covering the three winters of daily metered volume and weather data, these two Centra days and one Great Lakes day illustrate the need for MERC-NMU to be able to identify the amount of non-firm load on their system on a daily basis.

The MERC-NMU-Centra scatter plot graph provided on the "CentraGraph" tab in the attached Excel file "MERC-NMU-CentraWinterDataAndGraph20100408.xls" indicates the two points that OES Attachment 3 highlighted. They both show the highest daily metered volumes for their weather. The daily volumes for these two points are more consistent with days about 20 degrees colder (20 higher AHDD65), as can be seen on the "CentraSort" tab in the same Excel file. MERC-NMU confirmed that the Centra daily volume and weather data shown for these dates (February 12, 2007 and January 29, 2008) in OES Attachment 3 matched the data in MERC-NMU original source files. There did not appear to be anomalies in the town border station meter readings or the weather data. MERC-NMU observed that the 8,596 Mcf that occurred on Monday, February 12, 2007 with 56.7 AHDD65 was higher than the volumes for the prior Wednesday (82.1 AHDD65) and Thursday (76.6 AHDD65) , and the following Tuesday

(76.2 AHDD65) and Wednesday (74.6 AHDD65). Similarly, the 10,481 Mcf on Tuesday, January 29, 2008 with 72.0 AHDD65 is only exceeded by the next day's 10,656 Mcf with 93.8 AHDD65 (within two weeks before and after), even though there are thirteen days colder than 72.0 AHDD65 in that time frame.

The MERC-NMU-GLGT scatter plot graph provided on the "GLGTGraph" tab in the attached Excel file "MERC-NMU-GLGTWinterDataAndGraph20100408.xls" indicates the single point that OES Attachment 3 highlighted. It shows the highest daily metered volumes for the entire three winter period. MERC-NMU confirmed that the GLGT daily volume and weather data shown for this date (February 12, 2008) in OES Attachment 3 matched the data in MERC-NMU original source files. MERC-NMU observed that of the 16,065 Dth that occurred on Tuesday, February 12, 2008 with 60.0 AHDD65 was higher than any other volumes in the three winter period, even though there are 132 days colder than 60.0 AHDD65 in that time frame (see the "GLGTSort" tab in the same Excel file). Inspection of daily meter readings for the town border station "11903 Grand Rapids-NMU" shows the highest reading of 12,648 Dth occurred on February 12, 2008. The average reading for February 2008 was 6,846 Dth with an average of 61.0 AHDD65. The average reading for January 2008 was 6,722 Dth with an average of 61.3 AHDD65.

MERC-NMU believes that these high volume outliers (two for Centra and one for Great Lakes) contain significant non-heating, or process-driven, load that could be more indicative of transportation or interruptible customer consumption than traditional firm heating customer consumption (for example, non-firm customers running extra shifts or working overtime for just a few days a month). It is possible that the non-firm load on these days exceeded the estimates used by both MERC-NMU and OES in their analyses. If the actual non-firm load exceeded the

estimate, then the actual firm load would be lower than that shown in OES Attachment 3, and the entitlements would be reasonable. MERC-NMU expects that daily telemetry of non-firm load will help explain future high volume outliers such as these.

MERC-NMU's peak day forecast process uses daily metered data wherever possible. When certain non-firm customers have their own daily meter, their daily volumes are not included in the data used for the peak day regressions. For non-firm customers who do not have daily meters, their peak day consumption is estimated based on monthly billing data and the MERC-NMU tariff provision for estimating a transportation customer's Maximum Daily Quantity (MDQ) in the absence of a daily meter. When all non-firm customers have daily meters for the period covered by the peak day regression data, this non-firm customer MDQ estimate will no longer be needed.

2. <u>Northern Entitlement Level</u>

Attachment 5 of MERC's initial demand entitlement filing for MERC-PNG NNG in Docket No. G011/M-09-1284 indicates that the MERC-PNG design day volume on the NNG pipeline is 203,360 Dth with a total firm entitlement of 231,064 Dth and the MERC-NMU design day volume on the NNG pipeline is 24,680 Dth with a total firm entitlement of 23,611 Dth. Looking at each of these individually, NNG-PNG would have a 13.62 % positive reserve margin and NNG-NMU would have a 4.33% negative reserve margin. Capacity is allocated between NNG-PNG and NNG-NMU based upon the contractual delivery points. Even though NNG-NMU indicates a negative reserve margin, excess capacity from the positive reserve margin from NNG-PNG can be utilized to meet a design day requirement for NNG-NMU and therefore there are sufficient entitlements to serve MERC-NMU's Northern pipeline firm customers on a peak

day. Northern Natural Gas (NNG) does not have any additional space available in the NNG-NMU region to allow MERC to shift capacity from NNG-PNG to NNG-NMU. MERC's tariff also allows MERC to curtail interruptible customers in the event there is not enough capacity at a given Town Border Station (TBS).

3. Northern Firm Entitlements on MERC-NMU and MERC-PNG

As indicated above, MERC can utilize excess capacity from the MERC-PNG positive reserve margin to meet the MERC-NMU negative reserve margin on the NNG pipeline. Nominations on the NNG pipeline are scheduled to Point of Injection (POI) 3054, Zone E-F, MERC. By nominating to POI 3054, MERC is nominating natural gas to all of MERC-PNG and MERC-NMU communities located on the NNG pipeline. The NNG pipeline does not differentiate between MERC-PNG and MERC-NMU communities but instead recognizes MERC distribution as one system. MERC's tariff also allows MERC to curtail interruptible customers in the event there is not enough capacity at a given Town Border Station (TBS).

4. Installation of Telemetry

MERC first notes that in the Company's last rate case in Docket No. G007,011/GR-08-835, the Commission approved MERC's proposal to require telemetry for all interruptible and transportation customers.[1] MERC has put together a project team to address the telemetry installation. The team is currently in the process of reviewing equipment. MERC will look at

[1] In footnote 5 on page 5 of the OES's Comments, the OES noted that the Commission has required MERC to continue to provide balancing service for its Small Volume Interruptible customers, and the OES concluded that it will still be necessary for MERC to estimate daily use by Small Volume Interruptible customers in its estimate of peak-day use by firm customers. The Commission, however, approved MERC's proposal to require these customers to install telemetry while also requiring MERC to continue its Small Volume Balancing Service. Therefore, once telemetry is in place, it will no longer be necessary for MERC to estimate daily use by Small Volume Interruptible or Transportation customers. *See* Findings of Fact, Conclusions of Law, and Order, Docket No. G007,011/GR-08-835 (June 29, 2009) at 17-18.

utilizing both company personnel as well as 3rd party contractors to expedite the installations. MERC anticipates that the telemetry units will become functional at the time of installation. The current schedule in the business case is for installation to be completed in late 2010/early 2011.

5 . Impact of Wind Chill Calculation

MERC-NMU uses an Adjusted Heating Degree Day based on 65 degrees Fahrenheit (AHDD65) as its traditional weather variable for design day planning. The AHDD65 makes a simplified linear adjustment to the industry standard Heating Degree Day based on 65 degrees Fahrenheit to approximate the effect of wind speed on natural gas demand. The HDD65 equation is HDD65=MAX(0,65-AvgTemp) where AvgTemp is the average temperature for the day. The AHDD65 equation is AHDD65=HDD65*((100+Windmph)/100)) where Windmph is the average wind speed for the day expressed in miles per hour. Empirical evidence suggests that adjusting for wind effects on heating demand improves forecasting accuracy. The exact nature of the "best" wind adjustment may differ between service territories or between residential, commercial or industrial customers.

The National Weather Service offers a wind chill calculation that is designed to compute how cold a specific combination of ambient temperature and wind speed feels on exposed human skin. One of the primary uses of this wind chill calculation is to determine the number of minutes of safe outdoor exposure before the onset of frostbite. The current NWS wind chill equation is non-linear, requires average daily temperature to be below 50 and average wind speed to be above 3 mph:

Wind Chill=IF(AvgTemp<50,IF(Windmph>3,(35.74+(0.6215*AvgTemp)-(35.75*Windmph^0.16)+(0.4275*AvgTemp*Windmph^0.16)),AvgTemp),AvgTemp)

The wind chill calculated as above can be used as a temperature surrogate in computing a "wind chill heating degree day" based at 65 degrees Fahrenheit, or WCHDD65 as WCHDD65=MAX(0,65-wind chill). Although there are differences between exposed human skin and the various compositions of the exterior walls of homes and buildings, this method of adjusting for wind effects on ambient temperature may provide a better statistical "fit" for some regions or customer classes for peak day forecasting purposes.

There are two generally accepted "goodness of fit" statistics for regressions: sigma, also called the standard error of the regression, and R-Squared, also called the percent of variability in the dependent variable (demand) that is explained by the independent regression variables (weather and day indicators). Lower sigmas indicate less "spread" of the data around the regression line and therefore a better regression. Higher R-Squared values indicate a better regression.

MERC-NMU ran several ordinary least squares regressions to compare the results when using the AHDD65 variable with the results when using a WCHDD65 variable. These regressions were added to those already performed for the initial filing. Five new regression detail files including all data used and Excel regression results are attached:

- NMU-CentraWinter2010PeakDayWindChill20100315.xls
- NMU-GLGT&VGTWinter2010PeakDayWindChill20100315.xls
- NMU-GLGTWinter2010PeakDayWindChill20100315.xls
- NMU-NNGWinter2010PeakDayWindChill20100315.xls
- NMU-VGTWinter2010PeakDayWindChill20100315.xls

The differences between using AHDD65 and WCHDD65 are summarized for all of MERC-NMU in the attached summary file "MERCWindChillTestingSummary20100319.xls".

MERC-NMU uses the Adjusted R-Squared statistic in the summary attachment because it corrects for the potential error introduced when comparing (non-adjusted) R-Squared values for regressions using different numbers of variables.

As the attached summary file shows for total MERC-NMU, the WCHDD65 regression has a 3.2% higher sigma (4,589 vs. 4,447) and a lower Adjusted R- Squared (0.777 vs. 0.784) than the regression using the AHDD65 variable for MERC-NMU. Both goodness of fit measures indicate that, for MERC-NMU, the AHDD65 variable is better at predicting the load response to a combination of wind and temperature than the WCHDD65 variable.

The results of this analysis do not provide sufficiently compelling evidence for MERC-NMU to switch from using the traditional AHDD65 variable to a wind-chill based variable such as WCHDD65.

DATED this 12th day of April, 2010.

Respectfully submitted,

DORSEY & WHITNEY LLP

/s/ Michael J. Ahern

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Attorney for MERC

AFFIDAVIT OF SERVICE

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

Sarah J. Kerbeshian, being first duly sworn on oath, deposes and states that on the 12th day of April, 2010, the Reply Comments of Minnesota Energy Resources Corporation were electronically filed with the Minnesota Public Utilities Commission and the Minnesota Department of Commerce. A copy of the filing was delivered by electronic service or first class mail to the remaining individuals on the attached service list.

/s/ Sarah J. Kerbeshian

Subscribed and sworn to before me
this 12th day of April, 2010.

/s/ Paula R. Bjorkman
Notary Public, State of Minnesota

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