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November 1, 2016

VIA ELECTRONIC FILING

Daniel P. Wolf
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-Northern Natural Gas for Approval of a Change in Demand Entitlement – November 1 Update

Docket No. G011/M-16-650

Dear Mr. Wolf:

On August 1, 2016, Minnesota Energy Resources (“MERC” or the “Company”) filed its Petition for Change in Demand Entitlement for the MERC-NNG purchased gas adjustment (“PGA”). On October 28, 2016, the Department of Commerce, Division of Energy Resources (“Department”) submitted comments in the above-referenced docket, requesting that MERC provide additional information regarding MERC’s storage capacity additions, reconcile its design-day regression data, and provide further information regarding drivers of MERC-NNG’s relatively low reserve margin. MERC submits this update to its August 1, 2016 Demand Entitlement filing, which also provides responses to the Department’s requests for additional information relating to MERC’s storage capacity additions and reserve margin. MERC will provide the requested reconciliation of design-day data in subsequent Reply Comments.

In its April 28, 2016 Order in Docket No. G011/M-15-723, the Minnesota Public Utilities Commission (“Commission”) required that MERC explain changes made in its compliance petitions that are different from its original petitions, and provide a redline version of both petitions identifying changes.

As of the date of this filing, MERC has completed its purchases of future contract and call options for the 2016-17 winter period. This, along with an update in storage pricing is shown in attachment 11. Additionally, winter term gas purchases have been added to Attachment 6, page 2. Lastly, the cost of physical call options are

shown in Attachment 4, page 2. A redline of MERC's August 1, 2016 Petition is included as Attachment 1 to this filing and updated exhibits showing revisions highlighted in orange are included. MERC also submits the updated Attachments in Microsoft Excel format.

Please contact me at (651) 322-8965 if you have any questions regarding the information in this filing. Thank you for your attention to this matter.

Sincerely yours,

/s/ Amber S. Lee

Amber S. Lee
Regulatory and Legislative Affairs Manager
Minnesota Energy Resources Corporation

Enclosure

cc: Service List

Attachment 1—Redline Petition

**STATE OF MINNESOTA
BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION**

**Beverly Jones Heydinger
Nancy Lange
Dan Lipschultz
Matt Schuerger
John Tuma**

**Chair
Commissioner
Commissioner
Commissioner
Commissioner**

In the Matter of the Petition of Minnesota
Energy Resources Corporation for Approval of
a Change in Demand Entitlement for its NNG
System

Docket No. G011/M-16-650

**UPDATED PETITION OF MINNESOTA ENERGY RESOURCES CORPORATION-NNG FOR
CHANGE IN DEMAND**

I. Introduction

Pursuant to Minnesota Rule 7825.2910, subpart 2 (Filing Upon Change in Demand), Minnesota Energy Resources Corporation - NNG (MERC or the Company), a subsidiary of WEC Energy Group, hereby petitions the Minnesota Public Utilities Commission (Commission) for approval of changes in demand entitlements for MERC-NNG customers served off the Northern Natural Gas interstate pipeline system. MERC requests that the Commission approve the requested changes to be recovered in the Purchased Gas Adjustment (PGA) effective on November 1, 2016. Included with this filing are the following Attachments:

Attachment 1: Design-Day Demand Summary

Attachment 2: Sales Forecast

Attachment 3: Current and Proposed Entitlement Levels

Attachment 4: Rate Impact of the Proposed Demand Change

Attachment 5: Financial Option Summary

Attachment 6: Winter Plan

Attachment 7: Entitlement History

Attachment 8: Change in Entitlement Levels and Related Demand Costs

Attachment 9: Actual Throughput and Design Day Forecast Estimated Throughput

Attachment 10: Customer Counts

Attachment 11: Hedging Summary

II. **Discussion**

A. **MERC's NNG Design-Day Requirements**

Minn. R. 7825.2910, subp. 2 (b) requires that a filing upon change in demand include the utility's Design-Day demand by customer class and the change in Design-Day demand, if any, necessitating the demand revision. The NNG Design-Day requirement has increased by 3,533 Dth from the November 1, 2015, filing.

**Table 1: MERC Proposed NNG Reserve Margins
For the 2016-2017 Heating Season**

	Reserve Margin 2016-2017 Heating Season	Reserve Margin 2015-2016 Heating Season	Change
NNG Zone EF	1.34%	2.80%	1.46%

For the Demand Entitlement filing effective November 1, 2016, the total Design-Day requirement for MERC NNG is 248,701-796 Dth (Attachment 1). The difference between the total Design-Day requirement and total Design-Day capacity results in a 1.34% positive reserve margin (Attachment 3).

The Department of Commerce, Division of Energy Resources (the "Department") in its October 28, 2016, Comments in this docket, stated

Generally, a reserve margin of up to 5 percent is not unreasonable. While MERC-NNG's reserve margin has been below 5 percent in recent years, it is not clear that a reserve margin of less than 2 percent is reasonable. In reply comments the Department requests further information on the driver of the low reserve margin, including any actions that MERC may be contemplating to address the relatively low NNG reserve margin.

MERC responds that while the 2016-2017 reserve margin of 1.34 percent is relatively low, in light of the proposal before the Commission in Docket No. G011/M-15-895 to increase MERC's NNG capacity in the Rochester area and at other delivery points in southeastern Minnesota, and in light of the fact that the proposed NNG contract would provide significant flexibility for MERC to take delivery of the additional contracted capacity at alternative NNG delivery points, it makes sense at this time to maintain a small reserve margin in anticipation of the capacity to be added beginning in 2018/2019. MERC will continue to monitor the reserve margin to ensure it has adequate natural gas capacity to provide reliable natural gas service.

As required by Order Point 9 of the Commission's Order in Docket No. G011/M-15-723, Attachment 3 reflects the separate summer and winter demand entitlements for MERC-NNG.

B. Gas Supply

Minn. R. 7825.2910, subp. 2, requires a description of Design-Day gas supply from all sources under the new level, allocation, or form of demand. This information is provided in Attachment 3.

C. Forecast Methodology for MERC Demand Entitlement November 1, 2015

1. Peak-day

a. Purpose

Gather data and perform analysis used in the "Petition for Change in Demand" for MERC, otherwise known as the "MERC Demand Entitlement Filings."

b. Background

MERC customers are served by four pipelines:

1. VGT - Viking Gas Transmission system
2. NNG - Northern Natural Gas pipeline
3. GLGT - Great Lakes Gas Transmission pipeline
4. Centra - Centra pipeline

Before July 1, 2013, four Petitions for Change in Demand were filed (one for each PGA):

- A. PNG customers served off of VGT = PNG - VGT
- B. PNG customers served off of GLGT = PNG - GLGT
- C. PNG customers served off of NNG = PNG - NNG
- D. All NMU customers - served off of NNG, GLGT, VGT, & Centra = NMU

Effective July 1, 2013, two Petitions for Change in Demand need to be filed (one for each PGA):

- i. All MERC customers served off of NNG = NNG
- ii. All other PNG customers, served off of Centra, GLGT, & VGT = MERC NNG

Effective May 1, 2015, MERC acquired Interstate Power & Light Company's Minnesota natural gas operations and customers. The Commission's Order Approving Sale Subject to Conditions in Docket G-001,011/PA-14-107 required MERC to maintain the transitioned customers on a separate PGA until MERC's next rate case (MERC – NNG - Albert Lea).

Weather data is obtained from eight weather stations: International Falls, Bemidji, Cloquet, Fargo, Minneapolis, Rochester, Worthington, and Ortonville.

For analytical purposes, data is subdivided, analyzed, and regressed by the following demand areas:

	Pipeline	PGA	Weather Station(s)
1	Centra	MERC Consolidated	International Falls
2	GLGT	MERC Consolidated	Bemidji
3	GLGT	MERC Consolidated	Cloquet
4	VGT	MERC Consolidated	Fargo
5	NNG	MERC NNG	Cloquet
6	NNG	MERC NNG	Minneapolis

7	NNG	MERC NNG	Ortonville
8	NNG	MERC NNG	Rochester
9	NNG	MERC NNG	Worthington

2. Analytical Approach

a. Summary

1. Obtain daily weather data for each weather station.
2. Obtain daily total throughput volumes by pipeline and by weather station.
3. Obtain daily large volume transportation, interruptible, and joint interruptible volumes by pipeline and by weather station (“Data A”).
4. Obtain daily small volume interruptible volumes by pipeline and by weather station (“Data B”).
5. Calculate daily “firm” volumes by subtracting both Data A and Data B from total throughput volumes.
6. Perform quality control on volumetric data (e.g., identify missing or bad reads, and, to the extent possible, fix missing or bad reads).
7. Perform firm peak day regressions. In response to comments from the Minnesota Department of Commerce (Department):
 - a. Review and potentially change the regression methodology to mitigate the impact of autocorrelation.
 - b. Provide a reasonable explanation whenever we choose to use a regression model that does not have an intercept.
8. Add back Daily Firm Capacity (DFC) customer selections.

3. Process

The Peak Day Process consisted of:

- I. Data Preparation
- II. Regression Generation of Net Daily Metered Volumes
- III. Volume Risk Adjustments
- IV. Adjusting the Regression Results to a Firm Peak Day Estimate

i. The **Data Preparation** Steps consisted of:

- Identify the coldest Adjusted Heating Degree Day (AHDD) in the last 20 years for each weather station.
- Determine the most recent three years of December through February daily total metered throughput by pipeline and by weather station.
- Determine the most recent three years of December through February daily large volume transportation, interruptible, and joint interruptible volumes by pipeline and by weather station (“Data A”).
- Determine the most recent three years of December through February daily small volume interruptible volumes by pipeline and by weather station (“Data B”).
- Review daily total metered throughput, Data A, and Data B, and identify missing or bad reads, and to the extent possible, fix missing or bad reads. To the extent that the data could not be fixed, it was not included in the regressions.
- Subtract both Data A and Data B daily meter readings for all three December through February years from the total throughput for each pipeline and each weather station. Use the resulting net daily metered volumes for regressions. Examples of transportation, interruptible, and joint interruptible meter readings subtracted are paper

mills, direct-connects, taconites, and off-system end users. (See “Adjusting the Regression Results to a Firm Peak Day Estimate” below.)

Each daily weather station data file was searched to find the coldest Adjusted Heating Degree Day (AHDD65) in the last 20 years. This 1-in-20 approach is consistent with prior years. The results are provided in the following table:

<u>Station</u>	<u>Date</u>	<u>Avg. Temp</u>	<u>Avg. Wind</u>	<u>HDD65</u>	<u>AHDD65</u>
Bemidji	2/1/1996	-34	8	99	107
Cloquet	2/2/1996	-31	7	96	103
Fargo	1/18/1996	-16	34	81	109
International Falls	2/2/1996	-34	8	99	107
Minneapolis	2/2/1996	-25	8	90	97
Rochester	2/2/1996	-27	10	92	101
Worthington	1/18/1996	-8	32	73	96
Ortonville	1/14/2009	-21	11	86	96

ii. The **Regression Generation of Net Daily Metered Volumes** consisted of:

- For each of the pipelines and weather stations:
 1. Gather the net daily metered volumes and weather station data including AHDD65.¹
 2. Add indicator variables for day-type and month. Day-type variables are used to isolate load that changes by day of the week, such as commercial or industrial customers who may change their consumption on weekends when they run fewer shifts. Month indicator variables are used to isolate load that changes

¹ Temperature and weather data was obtained from Schneider Electric via TherMaxx then converted to HDD65 and AHDD65 in an Excel spreadsheet by MERC – Gas Supply. Temperature data is the average of the high and low temperature based on the 9am to 9am gas day. Wind data is the 24-hour average based on the 9am to 9am gas day.

based on winter months, such as businesses that are open extra hours in December and resume normal operating hours in January.

3. Perform ordinary least squares linear regressions for the 3-year time frame using the AHDD65 weather variable and the significant indicator variables.
4. In response to comments from the Department, changed the regression methodology to mitigate the impact of autocorrelation. See section below on autocorrelation.
5. In response to comments from the Department, provide a reasonable explanation whenever we choose to use a regression model that does not have an intercept.
6. Summarize the Baseload and Use/AHDD65 and Use/Prior Day AHDD65 from each regression.
7. Calculate a point estimate from each regression based on the baseload value plus the Use/AHDD65 coefficient times the coldest AHDD65 in 20 years and the Use/Prior Day AHDD65 coefficient times the AHDD65 on the day prior to the coldest AHDD65 in 20 years.

iii. **Volume Risk Adjustments**

Volume risk adjustments were incorporated into the forecast to provide a confidence level that the daily metered load under design conditions would not exceed the daily metered regression estimate. An appropriate volume risk adjustment was determined for each regression group by multiplying the standard error of each regression analysis (sigma) by a factor needed to attain a desired confidence level. The desired confidence level chosen was 97.5%.

iv. **Adjusting the Regression Results to a Firm Peak Day Estimate** consisted of:

1. Add back Daily Firm Capacity (DFC) customer selections

While transportation, interruptible, and joint interruptible customer volumes were removed (as described above), in order to determine firm peak day load, daily firm capacity selections needed to be added back. The Sales and Revenue Forecasting department provided historical monthly DFC data for the joint service customers from the prior winter that showed the volume that each customer has selected to receive as firm service from MERC each month. Based on direction from MERC Gas Supply, the Joint Firm/ Interruptible customers who were relying on MERC to provide peak day firm supply were identified and their daily firm capacity volumes were summed by month for each pipeline. The total volumes were then added back to the regression results.

**Exhibit 1
Pipeline and Weather Station Regression Notes**

A. Large Volume Transportation, Interruptible, and Joint Interruptible Customers

GLGT Paper Mills = Bandon mapped to Bemidji, and Sappi and USG mapped to Cloquet

VGT Lamb Weston mapped to Fargo

NNG Taconites / Direct Connects =

- CCI EMPIRE IND DEL PT 2 TILDEN mapped to Cloquet
- CCI NORTSHORE mapped to Cloquet
- UNITED TACONITE (was EVELETH TACONITE) mapped to Cloquet
- HIBBING TACONITE CO. mapped to Cloquet
- U.S. STEEL #1 & #2 mapped to Cloquet
- NATIONAL STEEL PELLET mapped to Cloquet
- COTTAGE GROVE TBS LS POWER mapped to Minneapolis
- INLAND STEEL mapped to Cloquet
- HANNA MINING mapped to Cloquet

NNG OSEU (End Users) =

- ARKEMA INC. mapped to Rochester

- MAYO Clinic 1 Fairmount mapped to Worthington
- MAYO Clinic 2 (Franklin Htg) mapped to Rochester
- MAYO Clinic 3 (St Mary's) mapped to Rochester
- ARCHER DANIELS MIDLAND, CO. mapped to Minneapolis
- ASSOCIATED MILK PRODUCTS, INC. mapped to Rochester
- Hawkins Inc. mapped to Minneapolis
- CORRECTIONAL CTR mapped to Minneapolis
- DAIRY FARMERS OF AMERICA mapped to Rochester
- Dick's Sanitation mapped to Minneapolis
- KEMPS LLC mapped to Rochester
- KERRY BIO-SCIENCE mapped to Rochester
- LAKESIDE mapped to Rochester
- MILK SPECIALTIES mapped to Worthington
- LAND OF LAKES mapped to Rochester
- PRO-CORN mapped to Rochester
- SWIFT mapped to Rochester
- SENECA FOODS-ROCHESTER mapped to Rochester
- ENGINEERED POLYMERS mapped to Cloquet
- SANDSTONE FEDERAL CORRECTIONAL INSTITUTE mapped to Cloquet
- Glenville #1 mapped to Rochester
- Agra Resources(Exol) mapped to Rochester
- Halcon Corporation mapped to Rochester
- REG ALBERT LEA, LLC mapped to Rochester
- Zinpro North Branch mapped to Minneapolis

B. Daily Firm Capacity

VGT

- DETROIT LAKES MIDDLE SCHOOL
- ROSSMAN SCHOOL

GLGT

- AMERIPRIDE
- NORTHLAND APTS
- NW TECH COLLEGE - BEMIDJI

NNG

- HENDRICKS HOSPITAL
- GLASSTITE INC

4. Autocorrelation Review

The Commission's February 4, 2015, Order in Docket Nos. G011/M-12-1192, G011/M-12-1193, G011/M-12-1194, and G011/M-12-1195, MERC's 2012-2013 demand entitlement dockets, required MERC to check its regression models for autocorrelation and correct the

model if autocorrelation is present and to provide a reasonable explanation of its use of no-intercept models if it chooses to use one again in the future.

In a regression analysis, using time series data, autocorrelation of the errors is a problem. Autocorrelation of the errors, which themselves are unobserved, can generally be detected because it produces autocorrelation in the observable residuals. (Errors are also known as “error terms” in econometrics.) Autocorrelation violates the ordinary least squares (OLS) assumption that the error terms are uncorrelated. While it does not bias the OLS coefficient estimates, the standard errors tend to be underestimated (and the t-scores overestimated) when the autocorrelations of the errors at low lags are positive. The traditional test for the presence of first-order autocorrelation is the Durbin–Watson statistic or, if the explanatory variables include a lagged dependent variable, Durbin's h statistic. To correct for this use, we used the Yule-Walker estimation method within the SAS software package to employ an AR(1) regression which then showed that the Durbin–Watson statistics are all either close to 2 or above.

5. Design-Day Model

Order Point 5 of the Commission’s January 21, 2015, Order in MERC’s 2010-2011 demand entitlement dockets, Docket Nos. G007/M-10-1166; G007/M-10-1167; G011/M-10-1168; and G011/M-10-1169, required that in future demand entitlement filings, MERC provide (1) the determinants used in its Design-Day models that account for each and every impact on usage associated with economic conditions and (2) a detailed explanation of each and every cause of unexpected changes in usage that might impact the Design-Day calculation, and what, if any, modifications the Company made to its Design-Day numbers. MERC does not forecast its Design Day using economic variables. Additionally, there were no unexpected changes in the Design-Day forecast.

6. Verification of Regression Analysis Results

Order Point 10 of the Commission's April 28, 2016, Order in Docket No. G011/M-15-723 required that MERC verify its regression analysis results in future demand entitlement filings to ensure the results are consistent with the underlying theory the analysis attempts to explain. MERC has carefully reviewed the results of its regression analysis and verified that the results are consistent with the underlying theory the analysis attempts to explain. Please see MERC's May 31, 2016, compliance filing in Docket Nos. G011/M-15-722, G011/M-15-723, and G011/M-15-724 for further discussion of this issue.

III. Additional Filing Requirements

A. **Daily Design-Day Estimate to Actual Comparison**

In the 2007-2008 demand entitlement dockets,² MERC agreed to include a daily estimate utilizing the Design-Day model, which is calculated in Attachment 9. The daily estimate is compared to actual consumption. The actual volumes are total throughput which includes interruptible and transportation volumes that are located behind MERC citygates. The Design-Day model only calculates firm volumes. MERC does not forecast on a daily/monthly basis utilizing the Design-Day model. The Design-Day model is utilized to calculate the theoretical peak day.

B. **Average Customer Counts**

In the 2007-2008 demand entitlement dockets, MERC agreed to include average customer counts which are provided in Attachment 10.

C. **Balancing**

Order Point 4 of the Commission's January 21, 2015, Order in MERC's 2010-2011 demand entitlement dockets, Docket Nos. G007/M-10-1166; G007/M-10-1167; G011/M-10-

² Docket Nos. G007/M-07-1402; G007/M-07-1403; G007/M-07-1404; and G007/M-07-1405.

1168; and G011/M-10-1169, required that in future demand entitlement filings, MERC provide a clarification of its statements regarding system balancing and detailed evidence assuring the Commission that the appropriate customer group is paying for any balancing charges or penalties. Additionally, in Docket No. G-999/AA-12-756, by Order dated November 14, 2013, the Commission ordered that “prospectively, all regulated natural gas utilities shall recover balancing service costs, and shall credit the utility’s penalty revenues and the pipeline’s revenue credits, to the commodity portion of the PGA effective with the earliest true-up filing (for revenues) or the earliest monthly PGA (for costs) that can reasonably be implemented.”

MERC subsequently revised its monthly PGA filings, beginning November 2013, to recover all balancing costs via the commodity portion of the PGA. MERC’s 2014 AAA and true-up filings, as well as the 2014 Demand Entitlement filing, also reflected this change. The current MERC-NNG demand entitlement filing includes detailed evidence of the allocation of balancing costs to the commodity portion of the PGA in Attachment 4, page 2 of 3.

D. MERC’s Proposed NNG System Demand-Related Changes

There are two types of demand entitlement changes. The first type is Design-Day Deliverability, which quantifies the amount of firm transportation and storage capacity actually available to MERC’s NNG customers during winter peak periods. The second type does not affect Design-Day Deliverability levels, but alters the capacity portfolio and the PGA costs recovered from customers.

1. Design-Day Deliverability Changes

As shown in Attachment 3, MERC-NNG proposes no change in Design-Day Deliverability.

MERC contracted for capacity on the Bison Pipeline for 50,000 Dth/day, which went into service on January 14, 2011. The contracted capacity with Northern Border Pipeline (NBPL)

went into effect at the in-service of Bison. This capacity does not add any incremental capacity but is utilized to deliver supply to NNG customers at NBPL interconnects with NNG.

2. Other Demand Entitlement Changes

As shown in Attachment 3, MERC–NNG proposes no change in April/October Deliverability. However, MERC requests changes to increase Firm Deferred Delivery (“FDD”) (storage) pipeline entitlements that are not included in peak day deliverability. MERC is requesting an increase in contract 130699 (previously 125915) from 150,000 Dth to 499,999 Dth of volume injected and contract 130699 (previously 125916) from 650,000 to 700,000. MERC will utilize this incremental storage to ensure supply price and reliability during the winter. MERC is targeting 30% of NNG winter forecast usage to be supplied from storage as discussed in the hedging explanation below. Without the increase in storage capacity, MERC would have had just under 30% of its forecast winter supply needs met by storage. With the increase, MERC is at 31.6% of forecast winter volume.

In its October 28, 2016 Comments, the Department requested that MERC provide a detailed explanation of the need for the proposed change to storage in reply comments. In particular, the Department requested that MERC address whether the decision to add storage was made for hedging purposes, anticipated growth, or another reason and whether the additional storage was added through an amendment to the current arrangement or through a separate agreement.

NNG storage has been difficult to procure in past years and firm storage (FDD) has not been available on the pipeline since March 4, 2013. MERC increased its storage capacity through a one-year capacity release with a third party that does not currently utilize its entire allotment of capacity. MERC has traditionally taken the entire volume this party offers because storage is otherwise unavailable. While slightly over its target of 30%, MERC’s procurement allows the Company to maintain a relationship with a third party whereby future capacity can be

procured at maximum tariff rates through release. In comparison, MERC pays nearly double maximum tariff rates for the portion of storage contract 118657 that was acquired through a storage expansion with NNG in 2008.

The Department also requested that MERC address why the contracted rates are above the NNG maximum tariff rate of \$1.7140/Dth and \$0.3567 for Reservation and Storage Cycle, respectively. MERC responds that the pricing of storage contract number 118657 is based on a market-based expansion. Under this pricing, MERC pays maximum tariff rates plus the cost of the expansion over the term of the contract.

In previous years, the demand cost associated with physical call options has been high. The influx of Canadian gas into MERC's market area has made these physical options much more attractive, so MERC entered into a number of physical call options that will ensure the Company has increased certainty around meeting peak day requirements. The demand cost is shown in Attachment 4, page 2. The premiums paid range from \$0.015-0.0425 dth/day.

E. Financial Option Units and Premiums

In accordance with the Commission's May 28, 2015, Order in Docket No. G011/M-15-231 approving MERC's variance extension request to recover the costs of financial instruments through the PGA, MERC provides the following information:

- i. a list of all financial instruments purchased for the upcoming heating season (see Attachment 11);
- ii. the cost premium associated with each contract (see Attachment 5);
- iii. the size (in MMBtu) of each contract (see Attachments 5 and 11);
- iv. the contract date (see Attachment 5);
- v. the contract price (see Attachment 11);
- vi. an attachment that details the projected total system sales estimates for the upcoming heating season, including all supporting data and

- assumptions used when calculating the sales forecast, and the total number of volumes hedged using financial instruments for the upcoming heating season (see Attachment 2 and Attachment 6, page 1 of 2); and
- vii. a detailed discussion of the anticipated benefits to ratepayers related to MERC's financial instrument contracts, discussed below.

The NNG 2016-2017 Winter Portfolio Hedging Plans - Minnesota Energy Resources Corporation for gas supply purchases is shown in Attachment 6. MERC's hedging strategy covers 60% of normal winter volumes; 30% through physical storage; and 30% through financial instruments. The weighted average price of currently purchased futures contracts of natural gas for the 2016/17 winter is \$3.~~0576~~1892. Please see Attachment 11, page 1 of 3. As shown in Attachment 11, page 2 of 3, MERC projects the NNG storage WACOG to be \$2.~~4197~~2348. ~~The remaining 20% is hedged with financial call options.~~ MERC has purchased call options at an average strike price of \$3.~~2040~~3057, which means if NYMEX contract(s) settle above that price, the options are exercised and MERC customers' gas cost is capped at the average strike price. Please see Attachment 11, page 3 of 3. The remaining 40% of normal winter volumes are purchased at index or market prices. All numbers reflected are natural gas costs only and do not include any transportation, storage, hedge premium, or margin costs.

F. PGA Cost Recovery

MERC proposes to begin recovering the costs associated with the change in demand-related costs in its monthly PGA effective November 1, 2016. Rate impacts associated with this change can be found on Attachment 4.

G. Impacts of Telemetry

Throughout the course of the year, a number of customers request to switch from interruptible to firm service. MERC evaluates these requests to determine the impact to our system and our upstream entitlement levels and our process requires us to evaluate the system

capability before we allow a customer to switch to firm. As a result, the firm volumes associated with a customer switch fall within the Design-Day parameters and do not impact our demand entitlement levels.

IV. Conclusion

~~If any changes to the entitlements for MERC-NNG are made, MERC will submit an update to this filing by November 1, 2016~~MERC NNG has completed its hedge and commodity purchases for the winter 2016-17 period and has a positive reserve margin of 1.34%. MERC requests that the Commission approve MERC's proposed Demand Entitlements to be recovered in the PGA effective on November 1, 2016.

DATED: ~~August~~November 1, 2016

Respectfully submitted,

MINNESOTA ENERGY RESOURCES
CORPORATION

By: /s/ Amber S. Lee
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MINNESOTA ENERGY RESOURCES - NNG

DESIGN-DAY DEMAND SUMMARY

NOVEMBER 1, 2016

NNG

Design Day Requirement		248,796
Total Peak Day Entitlement		252,127
2015/16 Firm Peak Day Actual Sendout	1/17/2016	204,444
Firm Annual Throughput - Minnesota		22,173,564
No. of Firm Customers		184,577
Department Load Factor Calculation		29.71%

MINNESOTA ENERGY RESOURCES - NNG

NNG MINNESOTA DESIGN DAY REQUIREMENTS

NOVEMBER 1, 2016

NNG

Pipeline Group	2015/16 Customer Count	Zone Total Customer Count	1/20 Design DDD	Regression Factors		Regression Total	Regression Adjustment	1/20 Requirements Regression Load	Estimated Contract Demand Units	Total *
				Intercept	Slope					

PEAK

NNG	184,577	184,577	98	16,052	2,204	233,977	14,724	248,701	95	248,796
Total	184,577	184,577								248,796

OFF PEAK

NNG	184,577	184,577	55	16,052	2,204	137,251	14,724	151,975	95	152,070
Total	184,577	184,577								152,070

* Adjusted for customer growth

MINNESOTA ENERGY RESOURCES - NNG

DESIGN-DAY DEMAND PER CUSTOMER - GS

NOVEMBER 1, 2016

NNG

<u>Heating Season</u>	<u>No. of Firm Customers</u>	<u>Design Day Requirements</u>	<u>MMBtu /Customer /Day</u>
16/17	184,577	248,796	1.35
15/16	181,326	245,263	1.35
14/15	178,388	261,002	1.46
13/14	178,578	245,878	1.38
12/13	176,937	225,883	1.28
11/12	175,241	235,055	1.34
10/11	176,027	218,213	1.24
09/10	175,228	228,040	1.30
08/09	173,962	247,188	1.42
07/08	172,116	223,754	1.30

MINNESOTA ENERGY RESOURCES - NNG

SUMMER/WINTER USAGE - Mcf
PROJECTED 12 MONTHS ENDING JUNE 2017
NNG

<u>Class</u>	<u>Summer Apr-Oct</u>	<u>Winter Nov-Mar</u>	<u>Total</u>
GS	5,816,438	16,341,713	22,158,151
SVI	469,909	1,163,282	1,633,191
SVJ	5,815	9,598	15,413
LVI	421,480	515,258	936,738
LVJ	0	0	0
SLV	0	0	0
Total	<u>6,713,642</u>	<u>18,029,851</u>	<u>24,743,493</u>

MINNESOTA ENERGY RESOURCES - NNG

ENTITLEMENT LEVELS
PROPOSED TO BE EFFECTIVE NOVEMBER 1, 2016

<u>Capacity Type</u>	<i>Summer</i>			<i>April/October</i>			<i>Winter</i>		
	<u>2015/16</u> <u>MMBtu</u>	<u>Change</u> <u>MMBtu</u>	<u>Proposed</u> <u>MMBtu</u>	<u>2015/16</u> <u>MMBtu</u>	<u>Change</u> <u>MMBtu</u>	<u>Proposed</u> <u>MMBtu</u>	<u>2015/16</u> <u>MMBtu</u>	<u>Change</u> <u>MMBtu</u>	<u>Proposed</u> <u>MMBtu</u>
TF-12 Base & Variable	75,316	0	75,316	75,316	0	75,316	75,316	0	75,316
TF5	0	0	0	0	0	0	32,278	0	32,278
TFX - 12	32,297	0	32,297	32,297	0	32,297	32,297	0	32,297
TFX - 5	0	0	0	0	0	0	108,701	0	108,701
TFX- (Apr/Oct) Offpeak*	0	0	0	2,000	0	2,000	0	0	0
Bison	50,000	0	50,000	50,000	0	50,000	50,000	0	50,000
NBPL	50,000	0	50,000	50,000	0	50,000	50,000	0	50,000
Northwest Gas (Windom)	2,500	0	2,500	2,500	0	2,500	2,500	0	2,500
Northwestern Energy (Ortonville)	1,035	0	1,035	1,035	0	1,035	1,035	0	1,035
NNG Zone Delivery Call Option	0	0	0	0	0	0	0	0	0
Total	111,148	0	111,148	113,148	0	113,148	252,127	0	252,127
Heating Season Forecasted Design Day-Adjusted							245,263	3,533	248,796
Non-Heating Season Forecasted Design Day				147,001	5,069	152,070			
Heating Season Capacity Surplus/Shortage							6,864	(3,533)	3,331
Non-Heating Season Capacity Surplus/Shortage				(33,853)	(5,069)	(38,922)			
*Not included in Heating Season Total entitlement									
Reserve Margin			N3	-23.03%	-2.57%	-25.59%	2.80%	-1.46%	1.34%

MINNESOTA ENERGY RESOURCES - NNG
RATE IMPACT OF THE PROPOSED DEMAND CHANGE
NOVEMBER 1, 2016

All costs in \$/Dth	Base Cost of Gas G011/MR15-748 Jan 1, 2016	Demand Charge Oct 1, 2015	Demand Charge Demand Filing Nov 1, 2015	Most Recent PGA Oct 1, 2016	Proposed Effective Nov 1, 2016	Result of Proposed Change			
						Change from Last Rate Case	Change from Nov 1, 2015 Demand Filing	Change from Last PGA %	Change from Last PGA \$
1) General Service Residential: Avg. Annual Use:		76	Dth						
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)
Demand Cost	\$0.9226	\$0.9947	\$0.9003	\$0.9317	\$0.9319	\$0.0093	\$0.0316	0.02%	\$0.0002
Commodity Margin	\$2.1806	\$2.1806	\$2.1806	\$2.3980	\$2.3980	\$0.2174	\$0.2174	0.00%	\$0.0000
Total Cost of Gas	\$7.4249	\$6.6639	\$6.4688	\$6.6830	\$6.3981	(\$1.0268)	(\$0.0707)	-4.26%	(\$0.2849)
Avg Annual Cost	\$564.29	\$506.46	\$491.63	\$507.91	\$486.25	(\$78.04)	(\$5.38)	-4.26%	(\$21.66)
Effect of proposed commodity change on average annual bills: (\$21.67)									
Effect of proposed demand change on average annual bills: \$0.01									
2) Small Vol. Interruptible: Avg. Annual Use:		4,508	Dth						
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)
Demand Cost									
Commodity Margin	\$0.8490	\$0.8490	\$0.8490	\$0.9336	\$0.9336	\$0.0846	\$0.0846	0.00%	\$0.0000
Total Cost of Gas	\$5.1707	\$4.3376	\$4.2369	\$4.2869	\$4.0018	(\$1.1689)	(\$0.2351)	-6.65%	(\$0.2851)
Avg Annual Cost	\$23,309.52	\$19,553.90	\$19,099.95	\$19,325.35	\$18,040.11	(\$5,269.40)	(\$1,059.83)	-6.65%	(\$1,285.23)
Effect of proposed commodity change on average annual bills: (\$1,285.23)									
Effect of proposed demand change on average annual bills: \$0.00									
3) Large Vol. Interruptible: Avg. Annual Use:		12,372	Dth						
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)
Demand Cost									
Commodity Margin	\$0.4553	\$0.4553	\$0.4553	\$0.5007	\$0.5007	\$0.0454	\$0.0454	0.00%	\$0.0000
Total Cost of Gas	\$4.7770	\$3.9439	\$3.8432	\$3.8540	\$3.5689	(\$1.2081)	(\$0.2743)	-7.40%	(\$0.2851)
Avg Annual Cost	\$59,101.04	\$48,793.93	\$47,548.07	\$47,681.69	\$44,154.43	(\$14,946.61)	(\$3,393.64)	-7.40%	(\$3,527.26)
Effect of proposed commodity change on average annual bills: (\$3,527.26)									
Effect of proposed demand change on average annual bills: \$0.00									
4) Small Vol. Firm: Avg. Annual Use:		4,508	Dth						
		25	Dth						
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)
Demand Cost	\$10.1722	\$10.3446	\$10.0707	\$10.2650	\$10.2670	\$0.0000	\$0.1963	0.02%	\$0.0020
Commodity Margin	\$0.8490	\$1.0647	\$0.8490	\$0.9336	\$0.9336	\$0.0846	\$0.0846	0.00%	\$0.0000
Demand Margin	\$2.5000	\$2.5000	\$2.5000	\$2.7493	\$2.7493	\$0.2493	\$0.2493	0.00%	\$0.0000
Total Cost of Gas	\$5.1707	\$4.5533	\$4.2369	\$4.2869	\$4.0018	(\$1.1689)	(\$0.2351)	-6.65%	(\$0.2851)
Total Demand Cost	\$12.6722	\$12.8446	\$12.5707	\$13.0143	\$13.0163	\$0.3441	\$0.4456	0.02%	\$0.0020
Avg Annual Cost	\$23,626.32	\$20,847.39	\$19,414.21	\$19,650.70	\$18,365.52	(\$5,260.80)	(\$1,048.69)	-6.54%	(\$1,285.18)
Effect of proposed commodity change on average annual bills: (\$1,285.23)									
Effect of proposed demand change on average annual bills: \$0.05									
5) Large Vol. Firm: Avg. Annual Use:		12,372	Dth						
		75	Dth						
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)
Demand Cost	\$10.1722	\$10.3446	\$10.0707	\$10.2650	\$10.2670	\$0.0948	\$0.1963	0.02%	\$0.0020
Commodity Margin	\$0.4553	\$0.4553	\$0.4553	\$0.5007	\$0.5007	\$0.0454	\$0.0454	0.00%	\$0.0000
Demand Margin	\$2.5000	\$2.5000	\$2.5000	\$2.7493	\$2.7493	\$0.0000	\$0.2493	0.00%	\$0.0000
Total Cost of Gas	\$4.7770	\$3.9439	\$3.8432	\$3.8540	\$3.5689	(\$1.2081)	(\$0.2743)	-7.40%	(\$0.2851)
Total Demand Cost	\$12.6722	\$12.8446	\$12.5707	\$13.0143	\$13.0163	\$13.0163	\$0.4456	0.02%	\$0.0020
Avg Annual Cost	\$60,051.46	\$49,757.28	\$48,490.87	\$48,657.76	\$45,130.66	(\$13,970.39)	(\$3,360.22)	-7.25%	(\$3,527.10)
Effect of proposed commodity change on average annual bills: (\$3,527.26)									
Effect of proposed demand change on average annual bills: \$0.15									

Note: Average Annual Average based on NNG Annual Automatic Adjustment Report in Docket No. E,G999/AA-16-524

MINNESOTA ENERGY RESOURCES - NNG
RATE IMPACT OF THE PROPOSED DEMAND CHANGE

NOVEMBER 1, 2016

NNG

IV. NORTHERN NATURAL GAS COMPANY'S RATES -- CURRENT COST OF GAS EFFECTIVE						
		Tariff-Summer(7 mths)	Tariff-Winter(5 mths)	Wt. Annual	GRI	01-Nov-16 Total
TF-12B	112495	\$ 5.6830	\$ 10.2300	\$7.5776	\$0.0000	\$7.5776
TF-12B Discount	112495	\$ 5.6830	\$ 10.0320	\$7.4951	\$0.0000	\$7.4951
TF-12V	112495	\$ 5.6830	\$ 13.8660	\$9.0926	\$0.0000	\$9.0926
TF-5	112495	\$ -	\$ 15.1530	\$15.1530	\$0.0000	\$15.1530
TFX	112486	\$ 5.6830	\$ 15.1530	\$9.6288	\$0.0000	\$9.6288
TFX-5	112486	\$ -	\$ 15.1530	\$15.1530	\$0.0000	\$15.1530
TFX-5 Discount	112486	\$ -	\$ 10.0320	\$10.0320	\$0.0000	\$10.0320
TFX - Discount	111866	\$ 2.2192	\$ 15.1392	\$7.6025	\$0.0000	\$7.6025
TFX - Discount	111866	\$ 4.8640	\$ 4.8640	\$4.8640	\$0.0000	\$4.8640
TFX - Discount	111866	\$ 5.4720	\$ 5.4720	\$5.4720	\$0.0000	\$5.4720
TFX-5	127852	\$ -	\$ 15.1530	\$15.1530	\$0.0000	\$15.1530
Gas Cost						\$2.2444/Dth

V. ANNUAL SALES -- As approved in Docket No. G011/MR-15-748

253,351,745

VI. MERC-NNG'S CURRENT COST OF GAS EFFECTIVE:

01-Nov-16

		Contract # (s)	Monthly Entitlement (Dth)	Months	Rate (\$/Dth)	Contract Costs	Rate/Therm
A. GS-NNG	TF12B (Max Rate) Winter	112495	39,826	5	\$ 10.2300	\$2,037,100	\$ 0.00905
	TF12B (Max Rate) Summer	112495	39,826	7	\$ 5.6830	\$1,584,318	\$ 0.00704
	TF12V (Max Rate)	112495	30,290	12	\$ 9.0926	\$3,304,978	\$ 0.01469
	TF5 (Max Rate)	112495	32,278	5	\$ 15.1530	\$2,445,543	\$ 0.01087
	TF12B (Discount-Winter)	112495	5,200	12	\$ 7.4951	\$467,694	\$ 0.00208
	TFX12 (Max Rate)	112486	10,822	12	\$ 9.6288	\$1,250,434	\$ 0.00556
	TFX Apr (Max Rate)	112486	2,000	1	\$ 5.6830	\$11,366	\$ 0.00005
	TFX Oct (Max Rate)	112486	2,000	1	\$ 5.6830	\$11,366	\$ 0.00005
	TFX5 (Max Rate)	112486	81,888	5	\$ 15.1530	\$6,204,244	\$ 0.02757
	TFX5 (Discount)	112486	1,800	5	\$ 10.0320	\$90,288	\$ 0.00040
	TFX12 (Discount)	111866	1,283	12	\$ 4.8640	\$74,886	\$ 0.00033
	TFX12 (Discount)	111866	8,271	12	\$ 5.4720	\$543,107	\$ 0.00241
	TFX12 (Discount)	111866	11,921	12	\$ 7.6025	\$1,087,553	\$ 0.00483
	TFX5 (Discount)	111866	379	5	\$ 4.8640	\$9,217	\$ 0.00004
	TFX5 (Discount)	111866	2,445	5	\$ 5.4720	\$66,895	\$ 0.00030
	TFX5 (Discount)	111866	22,189	5	\$ 15.1392	\$1,679,619	\$ 0.00746
	Windom	118657	2,500	12	\$ -	\$0	\$ -
	Northwestern Energy		1,035	12	\$ 8.3382	\$103,560	\$ 0.00046
	Total Demand Cost					\$20,972,168	\$ 0.09319
	As approved in Docket No. G011/MR-15-748					225,057,235	
	GS-1 Demand Current Cost of Gas/therm					\$	\$ 0.09319
	GS-1 Commodity Current Cost of Gas/therm					\$	\$ 0.30682
	Total GS-1 Current Cost of Gas/therm					\$	\$ 0.40001

B. GS-NNG, SVI-NNG, LVI-NNG, SJ-NNG, LJ-NNG, SLV-Commodity

		Monthly Entitlement (Dth)	Months	Rate (\$/Dth)	Contract Costs	Contract Costs	Rate (\$/therm)
FDD: FDD - Reservation	118657	75,437	12	\$ 1.7140	=	\$1,551,588	\$ 0.00612
FDD - Storage Cycle	118657	869,864	5	\$ 0.3567	=	\$1,551,402	\$ 0.00612
FDD - Reservation	118657	5,550	12	\$ 3.3157	=	\$220,826	\$ 0.00087
FDD - Storage Cycle	118657	64,000	5	\$ 0.6901	=	\$220,832	\$ 0.00087
FDD - Reservation	130698	12,141	12	\$ 1.7140	=	\$249,716	\$ 0.00099
FDD - Storage Cycle	130698	140,000	5	\$ 0.3567	=	\$249,690	\$ 0.00099
FDD - Reservation	130699	8,672	12	\$ 1.7140	=	\$178,366	\$ 0.00070
FDD - Storage Cycle	130699	100,000	5	\$ 0.3567	=	\$178,350	\$ 0.00070
Firm Deferred Delivery Storage Contracts						\$4,400,770	\$ 0.01737

Per Docket No. G-007/M-07-1402-05 dated August 6, 2014, storage demand charges will be allocated through the commodity charge effective 11/1/2014.

		Monthly Entitlement (Dth)	Months	Rate (\$/Dth)	Contract Costs	Contract Costs	Rate (\$/therm)
Bison	FT0003	50,000	12	\$ 17.4896	=	\$10,493,750	\$ 0.04142
NBPL	T8673F	50,000	12	\$ 6.9958	=	\$4,197,500	\$ 0.01657
						\$14,691,250	\$ 0.05799

Per Doct No. G-007/M-10-1166 and G-011/M-10-1168 dated January 26, 2015, recover the costs associated with Bison contract through commodity effective

		Annual Sales (Dth)	Rate (\$/Dth)	Commodity Cost	Rate Case Sales (therm)	Rate (\$/therm)
CD-1 Commodity		25,335,175	\$2.2444	\$56,862,266	253,351,745	\$ 0.22444
SMS-Bal Service		272,160	\$2.1800	\$593,309	253,351,745	\$ 0.00234

Physical Forward Start Premium \$175,451 253,351,745 \$ 0.00069

Call Option Premium \$1,010,681 253,351,745 \$ 0.00399

GS-NNG, SVI-NNG, LVI-NNG, SJ-NNG, LJ-NNG, SLV Commodity Current Cost of Gas/therm

\$63,042,477 253,351,745 \$ 0.30682

MINNESOTA ENERGY RESOURCES - NNG

RATE IMPACT OF THE PROPOSED DEMAND CHANGE

NOVEMBER 1, 2016

NNG

COSTS ASSIGNED IN JOINT RATE:							
	Units	Contract #	Month	\$/Dth	=	Cost	\$/therm
TF12B (Max Rate) Winter	39,826	112495	5	\$10.2300	=	\$2,037,100	\$0.09973
TF12B (Max Rate) Summer	39,826	112495	7	\$5.6830	=	\$1,584,318	\$0.07756
TF12V (Max Rate)	30,290	112495	12	\$9.0926	=	\$3,304,978	\$0.16180
TF5 (Max Rate)	32,278	112495	5	\$15.1530	=	\$2,445,543	\$0.11972
TF12B (Discount-Winter)	5,200	112495	12	\$7.4951	=	\$467,694	\$0.02290
TFX12 (Max Rate)	10,822	112486	12	\$9.6288	=	\$1,250,434	\$0.06122
TFX Apr (Max Rate)	2,000	112486	1	\$5.6830	=	\$11,366	\$0.00056
TFX Oct (Max Rate)	2,000	112486	1	\$5.6830	=	\$11,366	\$0.00056
TFX5 (Max Rate)	81,888	112486	5	\$15.1530	=	\$6,204,244	\$0.30373
TFX5 (Discount)	1,800	112486	5	\$10.0320	=	\$90,288	\$0.00442
TFX12 (Discount)	1,283	111866	12	\$4.8640	=	\$74,886	\$0.00367
TFX12 (Discount)	8,271	111866	12	\$5.4720	=	\$543,107	\$0.02659
TFX12 (Discount)	11,921	111866	12	\$7.6025	=	\$1,087,553	\$0.05324
TFX5 (Discount)	379	111866	5	\$4.8640	=	\$9,217	\$0.00045
TFX5 (Discount)	2,445	111866	5	\$5.4720	=	\$66,895	\$0.00327
TFX5 (Discount)	22,189	111866	5	\$15.1392	=	\$1,679,619	\$0.08223
Windom	2,500	118657	12	\$0.0000	=	\$0	\$0.00000
Northwestern Energy	1,035		12	\$8.3382	=	\$103,560	\$0.00507
TOTAL						\$20,972,169	
Annualized Entitlement						20,426,710	
Demand Component						<u>\$1,026,700</u>	\$1.02670

MINNESOTA ENERGY RESOURCES - NNG

Financial Options Heating Season 2016-2017

[TRADE SECRET DATA BEGINS

Units - Gas Daily Peaker Packages (Physical)

November		December		January		February		March		Daily Total	Term Total
Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume		
N/A		N/A		N/A		N/A		N/A		-	-

Premium - Gas Daily Peaker (Monthly Cost)

November		December		January		February		March		Option Premium	Total Premium Cost
Option Premium	Premium Cost	Option Premium	Premium Cost	Option Premium	Premium Cost	Option Premium	Premium Cost	Option Premium	Premium Cost		
N/A		N/A		N/A		N/A		N/A			

Units - Futures (Daily Volume)

	November		December		January		February		March		Term Total
	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	
1	05/18/16	1,823	05/26/16	1,262	05/25/16	2,788	05/19/16	2,801	05/23/16	2,028	321,535
2	06/02/16	1,302	05/26/16	1,010	06/20/16	2,788	06/14/16	2,801	05/23/16	253	243,084
3	07/07/16	781	06/22/16	2,272	07/22/16	2,281	07/13/16	1,401	06/16/16	2,028	266,659
4	07/07/16	521	07/26/16	1,767	08/22/16	2,281	07/13/16	1,120	07/18/16	1,774	227,494
5	08/02/16	1,302	08/25/16	1,767	09/19/16	2,028	08/04/16	1,120	08/08/16	1,521	235,218
6	09/07/16	1,302	09/26/16	1,767	10/18/16	2,028	08/04/16	1,120	09/15/16	1,267	227,361
7	10/05/16	1,302	10/24/16	1,767	01/00/00	-	09/09/16	1,961	09/15/16	253	156,604
8							10/11/16	1,961	10/13/16	1,521	102,045
9											
10											
Total		8,333		11,613		14,194		14,286		10,645	1,780,000

Units - Call Options (Daily Volume)

	November		December		January		February		March		Term Total
	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	Contract Date	Daily Volume	
1	05/24/16	3,138	05/20/16	4,259	05/19/16	5,024	05/25/16	2,521	05/18/16	3,802	570,373
2	06/17/16	3,138	06/15/16	4,008	06/13/16	5,024	05/26/16	2,521	06/01/16	3,802	562,607
3	07/21/16	3,138	07/15/16	4,008	07/11/16	4,773	06/21/16	5,042	07/06/16	3,802	625,407
4	08/09/16	2,615	08/05/16	4,008	08/03/16	4,773	07/25/16	4,762	08/01/16	3,295	586,158
5	09/15/16	2,615	09/09/16	3,758	09/08/16	4,522	08/23/16	4,762	09/06/16	3,295	570,604
6	10/03/16	2,354	10/12/16	3,507	10/07/16	4,271	09/20/16	2,801	10/17/16	3,295	492,302
7							09/20/16	1,681			47,059
8							10/20/16	4,482			125,490
Total		17,000		23,548		28,387		28,571		21,290	3,580,000

Premium - Call Option (Monthly Cost)

	November		December		January		February		March		Option Premium	Total Premium Cost
	Option Premium	Premium Cost	Option Premium	Premium Cost	Option Premium	Premium Cost	Option Premium	Premium Cost	Option Premium	Premium Cost		
1	\$ 0.1840	\$ 17,324	\$ 0.2420	\$ 31,949	\$ 0.2580	\$ 40,184	\$ 0.3300	\$ 23,294	\$ 0.3600	\$ 42,429	\$ 0.2721	\$ 155,180
2	\$ 0.2020	\$ 19,019	\$ 0.2410	\$ 29,946	\$ 0.2860	\$ 44,545	\$ 0.3500	\$ 24,706	\$ 0.3680	\$ 43,371	\$ 0.2872	\$ 161,587
3	\$ 0.1800	\$ 16,948	\$ 0.2750	\$ 34,170	\$ 0.2750	\$ 40,690	\$ 0.3470	\$ 48,988	\$ 0.4530	\$ 53,389	\$ 0.3105	\$ 194,186
4	\$ 0.1450	\$ 11,377	\$ 0.2560	\$ 31,809	\$ 0.3000	\$ 44,389	\$ 0.3400	\$ 45,333	\$ 0.3530	\$ 36,056	\$ 0.2883	\$ 168,965
5	\$ 0.1540	\$ 12,083	\$ 0.1700	\$ 19,803	\$ 0.3080	\$ 43,175	\$ 0.3640	\$ 48,533	\$ 0.3500	\$ 35,750	\$ 0.2793	\$ 159,344
6	\$ 0.0860	\$ 6,073	\$ 0.1500	\$ 16,309	\$ 0.2960	\$ 39,187	\$ 0.3270	\$ 25,647	\$ 0.3400	\$ 34,729	\$ 0.2477	\$ 121,944
7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.3260	\$ 15,341	\$ -	\$ -	\$ 0.3260	\$ 15,341
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.2720	\$ 34,133	\$ -	\$ -	\$ 0.2720	\$ 34,133
Total	\$ 0.1624	\$ 82,824	\$ 0.2246	\$ 163,986	\$ 0.2866	\$ 252,171	\$ 0.3325	\$ 265,976	\$ 0.3723	\$ 245,724	\$ 0.2823	\$ 1,010,681

Units - Collar Floor (put)

No Puts were purchased.

Attachment 6
Page 1 of 2

16/17 Winter Portfolio Plan - NNG MERC Hedging Plan

10,000 Contract Size

System	Purchase Month	Nov-16		Dec-16		Jan-17		Feb-17		Mar-17		Total		Percent of Requirements
		Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	
MN Requirements			2,582,959		3,698,468		4,405,045		4,006,697		3,336,682		18,029,851	18,029,851
NNG -MERC			86,099		119,305		142,098		143,096		107,635		119,403	
10%	Futures		258,296		369,847		440,505		400,670		333,668		1,802,985	
20%	Call		516,592		739,694		881,009		801,339		667,336		3,605,970	
30%	Storage		774,888		1,109,540		1,321,514		1,202,009		1,001,005		5,408,955	
40%	Index		1,033,184		1,479,387		1,762,018		1,602,679		1,334,673		7,211,940	
Futures Contracts	May-16	5	50,000	6	60,000	8	80,000	7	70,000	6	60,000	32	320,000	
	Jun-16	4	40,000	6	60,000	8	80,000	7	70,000	6	60,000	31	310,000	
	Jul-16	4	40,000	6	60,000	7	70,000	7	70,000	6	60,000	30	300,000	
	Aug-16	4	40,000	6	60,000	7	70,000	7	70,000	5	50,000	29	290,000	
	Sep-16	4	40,000	6	60,000	7	70,000	6	60,000	5	50,000	28	280,000	
	Oct-16	4	40,000	6	60,000	7	70,000	6	60,000	5	50,000	28	280,000	
	Total	25	250,000	36	360,000	44	440,000	40	400,000	33	330,000	178	1,780,000	9.87%
Call Options	May-16	9	90,000	13	130,000	15	150,000	14	140,000	11	110,000	62	620,000	
	Jun-16	9	90,000	12	120,000	15	150,000	14	140,000	11	110,000	61	610,000	
	Jul-16	9	90,000	12	120,000	15	150,000	13	130,000	11	110,000	60	600,000	
	Aug-16	8	80,000	12	120,000	15	150,000	13	130,000	11	110,000	59	590,000	
	Sep-16	8	80,000	12	120,000	14	140,000	13	130,000	11	110,000	58	580,000	
	Oct-16	8	80,000	12	120,000	14	140,000	13	130,000	11	110,000	58	580,000	
	Total	51	510,000	73	730,000	88	880,000	80	800,000	66	660,000	358	3,580,000	19.86%
Collars	May-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Jun-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Jul-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Aug-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Sep-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Oct-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Index (back financial)	Total		760,000		1,090,000		1,320,000		1,200,000		990,000		5,360,000	29.73%
Physical Hedges			0		0		0		0		0		0	
Storage			552,759		1,388,984		1,388,984		1,388,984		552,759		5,272,469	29.24%
Prepaid Obl			0		0		0		0		0		0	0.00%
Term Index			50.82%		67.03%		61.50%		64.62%		46.24%		58.97%	58.97%
			0		0		0		0		0		0	0.00%
			0		0		0		0		0		0	0.00%
Total NNG MN													1,780,000	9.87%
Futures													3,580,000	19.86%
Call Options													0	0.00%
Costing Collar													5,272,469	29.24%
Storage													0	0.00%
Prepaid Obl													0	0.00%
Term Index													0	0.00%
Month/Daily													7,397,382	41.03%
Total													18,029,851	100.00%

NOTE:

MINNESOTA ENERGY RESOURCES

**NNG WINTER PLAN
 NOVEMBER, 2015 THROUGH MARCH, 2016**

<u>PHYSICAL FIXED PRICE HEDGES</u>	<u>Deal #</u>	<u>Trigger Locked</u>	<u>Trigger Exercised</u>	<u>Receipt Point</u>	<u>Daily Volumes</u>					<u>Monthly Total</u>
					<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	
No Physical Fixed Price Hedges										-
Total Actual Fixed/Option Physical					-	-	-	-	-	-

INDEX

<u>Contract Number</u>	<u>Date</u>	<u>Receipt Point</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Total</u>
40710	8/25/2016	NNG Ventura	10,000	10,000	10,000	10,000	10,000	1,510,000
40717	8/25/2016	NNG Carlton	6,628	6,628	6,628	6,628	6,628	1,000,828
40707	8/25/2016	GRLKS/NNG Grand Rapid	-	1,000	1,000	1,000		90,000
40687	8/25/2016	GRLKS/NNG Grand Rapid	-	5,000	5,000	5,000		450,000
40705	8/25/2016	NBPL Port of Morgan	20,000	20,000	20,000	20,000	20,000	3,020,000
40763	8/25/2016	NBPL Port of Morgan	30,000	30,000	30,000	30,000	30,000	4,530,000
Total Actual Seasonal Index			66,628	72,628	72,628	72,628	66,628	10,600,828

GAS DAILY PACKAGES

<u>Physical Call Option</u>	40722	8/25/2016	NNG-GRLKS/NNGCarlton	5,000	5,000	5,000	5,000	5,000
<u>Physical Call Option</u>	40715	8/25/2016	NNG Ventura	10,000	10,000	10,000	10,000	10,000
<u>Physical Call Option</u>	40718	8/25/2016	NNG Ventura	-	5,500	5,500	5,500	-
<u>Physical Call Option</u>	40720	8/25/2016	NNG Ventura	10,000	10,000	10,000	10,000	10,000
<u>Physical Call Option</u>	40721	8/25/2016	NNG Ventura	-	10,000	10,000	10,000	-
<u>Physical Call Option</u>	40723	8/25/2016	NNG Ventura	-	4,500	4,500	4,500	-

STORAGE

<u>Injection Month</u>	<u>Contract # 118657 Volume Injected</u>	<u>Contract # 130698 Volume Injected</u>	<u>Contract # 130699 Volume Injected</u>	<u>Total Volume Injected</u>
May - balance forward	650,000	0	0	650,000
June	915,553	137,255	98,039	1,150,847
July	946,072	141,830	101,307	1,189,209
August	946,072	141,830	101,307	1,189,209
Sept	915,553	137,255	98,039	1,150,847
Oct (est)	296,071	141,830	101,307	539,208
Total	4,669,321	700,000	499,999	5,869,320

MINNESOTA ENERGY RESOURCES - NNG

	2012 NNG GS	2013 NNG GS	2014 NNG GS	2015 NNG GS	2016 NNG GS	Proposed Change
Design Day	200,785	245,878	261,002	245,263	248,796	3,533
Customer Requirements moving to Transportation 2005-6						
Adjusted Design Day						
Design Day Percentages	38.29%	28.43%	28.07%	32.40%	29.71%	-2.69%
Total Design Day Capacity (includes non-recallable capacity)	208,007	256,385	266,385	252,127	252,127	0
Less: Windom	2,500	2,500	2,500	2,500	2,500	0
Less: Northwestern Energy	910	910	910	1,035	1,035	0
Total Design Day Capacity	204,597	252,975	262,975	248,592	248,592	0
Factors for All Winter Capacity	100.00%	100.00%	100.00%	100.00%	100.00%	

Allocated Entitlements in PGA

TF12B	41,156					0
TF12V	25,820					0
TF5	28,704					0
TFX12	28,721					0
TFX(5)	80,197					0
TFX (October Only)	1,779					0
TFX (April Only)	1,779					0
NNG Zone Delivery Call Option	0					0
Bison *	44,463					0
NBPL *	44,463					0
Peak Capacity	205,508					0
Total Allocated Entitlements in PGA	297,082	0	0	0	0	0

* Bison/NBPL does not add incremental capacity but is utilized to deliver Rockies supply to NNG. Volume is not included in Peak Capacity.

Direct Assigned Entitlements in PGA

TF12B		49153	55,019	45,026	45,026	0
TF12V		26926	21,060	30,290	30,290	0
TF5		31515	31,515	32,278	32,278	0
TFX12		32297	32,297	32,297	32,297	0
TFX(5)		93084	123,084	108,701	108,701	0
TFX(5) (12-V)						0
TFX (April Only)		2000	2,000	2,000	2,000	0
TFX (October Only)		2000	2,000	2,000	2,000	0
Windom	2,500	2,500	2,500	2,500	2,500	0
Northwestern Energy	910	910	910	1,035	1,035	0
NNG Zone Delivery Call Option		20,000	0	0	0	0
Bison *		50,000	50,000	50,000	50,000	0
NBPL *		50,000	50,000	50,000	50,000	0
Total Direct Assignments	3,410	123,410	266,385	252,127	252,127	0
Total Capacity before Peak Shaving	208,918	123,410	266,385	252,127	252,127	0
LP Peak Shaving	0					0
Total Design Day Capacity	208,918	123,410	266,385	252,127	252,127	0
Total Annual Transportation	99,107	3,410	3,410	111,148	111,148	0
Total Seasonal Transportation	108,901	0	154,599	140,979	140,979	0
Total Percent Seasonal	52.1%	0.0%	58.0%	55.9%	55.9%	0.0%
Reserve Margin	4.05%	-49.81%	2.06%	2.80%	1.34%	-1.5%

Direct Assigned Demand Not in PGA

TF-12-B Contract Demand	0	0	0	0	0	0
Total Design Day Capacity w/ contract demand	208,007	256,385	266,385	252,127	252,127	0
Factors	38.29%	28.43%	28.07%	32.40%	29.71%	-2.69%

Other Entitlements not included in Peak Day Deliverability

TFX Oct	1,779	2,000	2,000	2,000	2,000	0
TFX Apr	1,779	2,000	2,000	2,000	2,000	0
FDD Storage Reservation	86,671	97,463	94,863	94,863	101,800	6,937
FDD Storage Capacity	999,411	1,123,864	1,093,864	1,093,864	1,093,864	0
FDD Maximum Storage Quantity	4,997,056	5,619,321	5,469,321	5,469,321	5,469,321	0
SMS	20,168	22,680	22,680	22,680	272,160	249,480

MINNESOTA ENERGY RESOURCES - NNG

Change in Costs due to November 1, 2016 Change in Entitlement Levels and Related Demand Costs

Costs Assigned In Demand	Contract	2015/16	2016/17	Entitlement Change	Months	2016/17	2015/16	2016/17	Total Annual Cost Change
		Entitlements	Entitlements			Rate	Total Annual Cost	Total Annual Cost	
TF12B (Max Rate) Winter	112495	39,826	39,826	0	5	\$10.2300	\$2,037,100	\$2,037,100	\$0
TF12B (Max Rate) Summer	112495	39,826	39,826	0	7	\$5.6830	\$1,584,318	\$1,584,318	\$0
TF12V (Max Rate)	112495	30,290	30,290	0	12	\$9.0926	\$3,304,978	\$3,304,978	\$0
TF5 (Max Rate)	112495	32,278	32,278	0	5	\$15.1530	\$2,445,543	\$2,445,543	\$0
TF12B (Discount-Winter)	112495	5,200	5,200	0	12	\$7.4951	\$467,694	\$467,694	\$0
TFX12 (Max Rate)	112486	10,822	10,822	0	12	\$9.6288	\$1,250,434	\$1,250,434	\$0
TFX Apr (Max Rate)	112486	2,000	2,000	0	1	\$5.6830	\$11,366	\$11,366	\$0
TFX Oct (Max Rate)	112486	2,000	2,000	0	1	\$5.6830	\$11,366	\$11,366	\$0
TFX5 (Max Rate)	112486	81,888	81,888	0	5	\$15.1530	\$6,204,244	\$6,204,244	\$0
TFX5 (Discount)	112486	1,800	1,800	0	5	\$10.0320	\$90,288	\$90,288	\$0
TFX12 (Discount)	111866	1,283	1,283	0	12	\$4.8640	\$74,886	\$74,886	\$0
TFX12 (Discount)	111866	8,271	8,271	0	12	\$5.4720	\$543,107	\$543,107	\$0
TFX12 (Discount)	111866	11,921	11,921	0	12	\$7.6025	\$1,087,553	\$1,087,553	\$0
TFX5 (Discount)	111866	379	379	0	5	\$4.8640	\$9,217	\$9,217	\$0
TFX5 (Discount)	111866	2,445	2,445	0	5	\$5.4720	\$66,895	\$66,895	\$0
TFX5 (Discount)	111866	22,189	22,189	0	5	\$15.1392	\$1,679,619	\$1,679,619	\$0
Windom	118657	2,500	2,500	0	12	\$0.0000	\$0	\$0	\$0
Northwestern Energy		1,035	1,035	0	12	\$8.3382	\$99,360	\$103,560	\$4,200
Total Demand Cost							\$20,967,969	\$20,972,169	\$4,200
Costs Assigned In Commodity		2015/16	2016/17	Entitlement		2016/17	2015/16	Entitlement	Entitlement
		Entitlements	Entitlement	Change	Months	Rate/Dth	Total Annual Cost	Total Cost	Change
<u>Upstream</u>									
<u>Surcharges:</u>									
<u>Storage (FDD)</u>									
FDD - Reservation	118657	75,437	75,437	0	12	\$ 1.7140	\$1,551,588	\$1,551,588	\$0
FDD - Storage Cycle	118657	869,864	869,864	0	5	\$ 0.3567	\$1,551,402	\$1,551,402	\$0
FDD - Reservation	118657	5,550	5,550	0	12	\$ 3.3157	\$220,826	\$220,826	\$0
FDD - Storage Cycle	118657	64,000	64,000	0	5	\$ 0.6901	\$220,832	\$220,832	\$0
FDD - Reservation	130698	2,602	12,141	9,539	12	\$ 1.7140	\$53,518	\$249,716	\$196,198
FDD - Storage Cycle	130698	30,000	140,000	110,000	5	\$ 0.3567	\$53,505	\$249,690	\$196,185
FDD - Reservation	130699	11,274	8,672	(2,602)	12	\$ 1.7140	\$231,884	\$178,366	(\$53,518)
FDD - Storage Cycle	130699	130,000	100,000	(30,000)	5	\$ 0.3567	\$231,855	\$178,350	(\$53,505)
<u>Pipeline</u>									
Bison	FT0003	50,000	50,000	0	12	\$17.4896	\$10,493,750	\$10,493,750	\$0
NBPL	T8673F	50,000	50,000	0	12	\$6.9958	\$4,197,500	\$4,197,500	\$0
SMS-Bal Service		272,160	272,160	0	1	\$2.1800	\$593,309	\$593,309	\$0
Physical Forward Start Premium							\$0	\$175,451	\$175,451
Producer Demand Payments/Option Premium							\$1,352,456	\$1,010,681	(\$341,775)
Total Commodity Costs							\$20,752,425	\$20,871,461	\$119,037

MINNESOTA ENERGY RESOURCES - NNG

Daily Total Throughput Data - July 1, 2015 through June 30, 2016

NNG

Design Day:

Base	16,052
Variable	2,204

Minnesota Energy Resources Corporation
2016-2017 Demand Entitlement
MERC-NNG
Attachment 9

Date	13.42% Cloquet Adjusted HDD	28.45% Minneapolis Adjusted HDD	44.70% Rochester Adjusted HDD	13.43% Worthington Adjusted HDD	100.00% Weighted Adjusted HDD	Actual Total Through- Put *	Estimated Firm Through- Put **
7/1/15	3	1	8	2	4	112,116	25,440
7/2/15	0	0	2	5	1	111,256	19,197
7/3/15	0	0	0	0	0	86,143	16,052
7/4/15	0	0	0	0	0	83,114	16,052
7/5/15	0	0	0	0	0	91,844	16,052
7/6/15	8	2	2	6	3	100,512	23,260
7/7/15	6	0	5	6	4	98,512	25,100
7/8/15	2	0	3	1	2	100,643	19,974
7/9/15	0	0	0	0	0	103,944	16,052
7/10/15	0	0	0	0	0	104,204	16,052
7/11/15	0	0	0	0	0	98,881	16,052
7/12/15	0	0	0	0	0	116,085	16,052
7/13/15	0	0	0	0	0	143,028	16,052
7/14/15	3	0	0	0	0	156,054	16,821
7/15/15	0	0	0	0	0	138,903	16,052
7/16/15	0	0	0	0	0	113,935	16,052
7/17/15	0	0	0	0	0	135,164	16,052
7/18/15	0	0	0	0	0	112,048	16,052
7/19/15	0	0	0	0	0	116,303	16,052
7/20/15	1	0	0	0	0	124,220	16,377
7/21/15	0	0	0	0	0	116,917	16,052
7/22/15	0	0	0	0	0	123,632	16,052
7/23/15	0	0	0	0	0	119,617	16,052
7/24/15	0	0	0	0	0	124,173	16,052
7/25/15	0	0	0	0	0	112,847	16,052
7/26/15	0	0	0	0	0	112,983	16,052
7/27/15	0	0	0	0	0	118,506	16,052
7/28/15	0	0	0	0	0	110,116	16,052
7/29/15	0	0	0	0	0	94,710	16,052
7/30/15	0	0	0	0	0	116,319	16,052
7/31/15	0	0	0	0	0	117,327	16,052
8/1/15	0	0	0	0	0	96,004	16,052
8/2/15	0	0	0	0	0	89,325	16,052
8/3/15	4	0	2	0	1	110,262	18,900
8/4/15	6	0	0	0	1	110,966	17,915
8/5/15	2	0	0	0	0	109,800	16,525
8/6/15	3	0	0	0	0	94,616	16,851
8/7/15	5	0	0	0	1	117,417	17,560
8/8/15	0	0	0	0	0	106,545	16,052
8/9/15	0	0	0	0	0	111,765	16,052
8/10/15	0	0	0	0	0	122,310	16,052
8/11/15	0	0	0	0	0	134,124	16,052
8/12/15	0	0	0	0	0	145,470	16,052
8/13/15	0	0	0	0	0	136,756	16,052
8/14/15	0	0	0	0	0	135,012	16,052
8/15/15	0	0	0	0	0	127,075	16,052
8/16/15	0	0	0	0	0	111,650	16,052
8/17/15	6	0	0	4	1	118,670	19,218
8/18/15	6	3	4	5	4	102,479	25,216
8/19/15	10	7	9	9	9	104,378	35,266
8/20/15	5	0	4	0	2	101,024	21,462
8/21/15	0	0	0	0	0	102,814	16,052
8/22/15	1	0	0	0	0	96,118	16,229
8/23/15	13	5	8	10	8	97,820	33,962
8/24/15	16	6	10	9	9	106,947	36,273
8/25/15	10	2	6	8	6	104,036	28,576
8/26/15	7	0	3	1	2	104,419	21,177
8/27/15	1	0	0	0	0	114,661	16,348
8/28/15	0	0	5	7	3	109,261	22,803
8/29/15	0	0	0	2	0	106,967	16,526
8/30/15	0	0	0	0	0	111,043	16,052
8/31/15	0	0	0	0	0	143,457	16,052
9/1/15	0	0	0	0	0	148,045	16,052
9/2/15	0	0	0	0	0	132,435	16,052
9/3/15	3	0	0	0	0	139,592	16,821
9/4/15	0	0	0	0	0	132,825	16,052
9/5/15	0	0	0	0	0	118,542	16,052
9/6/15	0	0	0	0	0	99,083	16,052
9/7/15	0	0	0	0	0	105,455	16,052
9/8/15	3	0	2	1	1	137,825	19,344
9/9/15	6	0	1	0	1	137,096	18,999
9/10/15	14	6	7	9	8	126,887	32,739
9/11/15	17	10	16	17	14	120,082	47,952
9/12/15	8	5	11	10	9	115,281	35,578
9/13/15	2	0	3	0	2	120,448	19,461
9/14/15	0	0	0	0	0	144,811	16,052

MERC

9/15/15	0	0	0	0	0	141,960	16,052
9/16/15	0	0	0	0	0	137,120	16,052
9/17/15	5	1	0	0	1	139,367	18,339
9/18/15	12	12	10	17	12	123,494	41,693
9/19/15	9	6	10	10	9	118,317	35,232
9/20/15	3	2	5	1	3	117,850	23,630
9/21/15	0	0	0	0	0	125,709	16,052
9/22/15	9	0	0	0	1	132,072	18,566
9/23/15	14	0	0	0	2	133,093	20,104
9/24/15	9	0	0	3	2	127,053	19,454
9/25/15	10	0	0	0	1	126,982	19,039
9/26/15	7	0	0	0	1	114,721	18,211
9/27/15	0	0	0	0	0	119,702	16,052
9/28/15	14	3	1	5	4	146,013	24,615
9/29/15	21	12	16	14	15	121,461	50,178
9/30/15	15	12	16	12	14	131,837	47,400
10/1/15	22	15	19	17	18	134,790	55,103
10/2/15	22	14	18	18	17	129,971	54,193
10/3/15	24	16	19	19	18	128,673	56,769
10/4/15	18	14	18	17	17	135,294	52,527
10/5/15	14	11	13	9	12	155,309	42,562
10/6/15	19	9	10	8	11	143,606	39,983
10/7/15	20	10	10	6	11	127,383	39,593
10/8/15	21	12	8	11	11	130,895	40,195
10/9/15	19	16	18	12	17	139,813	53,809
10/10/15	10	3	7	0	5	119,539	27,829
10/11/15	0	0	0	0	0	111,462	16,052
10/12/15	22	17	18	18	18	132,996	55,885
10/13/15	21	17	20	13	18	137,756	56,175
10/14/15	14	9	11	12	11	135,343	40,508
10/15/15	26	22	23	23	23	151,675	67,517
10/16/15	33	28	34	26	31	172,799	84,040
10/17/15	28	21	24	20	23	159,792	67,092
10/18/15	21	16	17	10	17	144,332	52,527
10/19/15	11	2	1	3	3	137,220	22,811
10/20/15	22	4	4	3	6	154,341	29,808
10/21/15	26	15	20	19	19	164,876	57,673
10/22/15	18	14	14	18	15	166,472	49,354
10/23/15	22	16	13	17	15	150,550	49,974
10/24/15	24	18	24	22	22	146,960	64,174
10/25/15	22	16	21	15	19	156,993	58,365
10/26/15	23	13	13	17	15	179,281	48,752
10/27/15	20	16	17	21	18	160,258	55,016
10/28/15	27	29	31	36	31	190,620	83,357
10/29/15	24	23	26	31	26	192,216	72,294
10/30/15	24	20	23	25	23	170,474	66,029
10/31/15	22	22	25	19	23	174,944	66,173
11/1/15	23	16	16	15	17	156,564	53,046
11/2/15	14	8	13	10	12	157,700	41,450
11/3/15	16	4	6	7	7	150,375	32,039
11/4/15	13	6	8	4	8	147,908	32,614
11/5/15	17	14	14	19	15	152,724	49,534
11/6/15	30	28	28	31	29	181,416	79,760
11/7/15	29	23	28	25	26	177,480	74,250
11/8/15	18	15	23	21	20	166,266	59,061
11/9/15	17	16	23	17	19	169,221	58,261
11/10/15	16	14	18	19	17	169,736	52,944
11/11/15	20	22	23	36	24	181,798	69,501
11/12/15	34	33	35	34	34	206,359	91,151
11/13/15	35	29	35	30	33	199,048	87,858
11/14/15	26	18	21	18	20	172,166	60,922
11/15/15	23	12	14	16	15	156,246	48,490
11/16/15	19	19	21	17	20	168,895	59,382
11/17/15	17	12	13	19	14	159,747	47,017
11/18/15	29	28	32	36	31	184,234	84,119
11/19/15	49	43	44	41	44	231,308	112,836
11/20/15	49	46	46	52	47	238,941	119,540
11/21/15	51	46	53	56	51	245,112	128,859
11/22/15	46	41	47	49	46	233,589	116,664
11/23/15	34	30	33	41	33	242,763	88,925
11/24/15	35	29	31	36	32	206,643	86,120
11/25/15	32	25	26	39	28	195,628	78,491
11/26/15	53	45	42	58	46	229,229	117,971
11/27/15	49	46	50	52	49	253,264	124,122
11/28/15	44	43	41	45	42	236,027	109,420
11/29/15	39	38	38	38	38	240,138	99,759
11/30/15	37	36	37	41	37	258,066	98,377
12/1/15	33	37	42	42	39	246,649	102,572
12/2/15	36	39	41	49	41	250,458	105,688
12/3/15	41	39	41	48	41	246,584	107,100
12/4/15	36	31	32	36	33	211,240	88,899
12/5/15	29	25	28	36	29	198,260	79,064
12/6/15	36	32	32	37	33	205,994	88,603
12/7/15	34	30	32	35	32	205,416	86,171
12/8/15	32	30	30	34	31	207,238	84,147
12/9/15	30	27	29	29	28	193,255	78,746
12/10/15	31	26	29	29	28	196,715	78,827
12/11/15	31	31	28	34	30	197,027	82,452
12/12/15	31	28	28	34	29	186,635	79,809

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12/13/15	35	31	29	38	32	193,177	86,158
12/14/15	41	35	36	38	37	222,827	96,686
12/15/15	41	34	33	34	34	218,362	92,026
12/16/15	42	38	43	47	42	233,671	108,688
12/17/15	52	49	52	53	51	262,148	128,846
12/18/15	65	56	57	58	58	286,438	143,274
12/19/15	56	49	49	48	50	250,787	125,888
12/20/15	42	32	31	39	34	221,388	90,974
12/21/15	44	35	36	43	38	239,189	99,543
12/22/15	38	36	39	39	38	237,710	99,490
12/23/15	43	40	42	42	42	237,621	107,593
12/24/15	49	41	42	45	43	239,543	111,498
12/25/15	43	40	44	43	42	233,761	109,593
12/26/15	51	45	44	60	47	242,771	120,019
12/27/15	61	52	52	68	55	274,072	137,338
12/28/15	50	49	53	62	53	272,304	131,920
12/29/15	53	44	45	50	46	265,048	118,401
12/30/15	49	53	55	60	54	278,000	135,206
12/31/15	52	56	59	63	57	266,295	142,337
1/1/16	49	47	54	53	51	253,716	128,441
1/2/16	46	46	52	51	49	244,735	124,817
1/3/16	44	49	52	57	51	259,625	127,866
1/4/16	48	52	57	63	55	293,984	137,609
1/5/16	42	42	50	50	47	258,369	119,026
1/6/16	40	38	43	38	40	263,144	104,862
1/7/16	36	34	36	38	36	251,493	94,847
1/8/16	51	51	52	63	53	253,834	132,773
1/9/16	78	76	81	83	79	328,255	190,636
1/10/16	79	74	84	75	79	370,281	190,988
1/11/16	79	72	74	70	74	367,073	178,102
1/12/16	75	72	74	70	73	371,941	177,049
1/13/16	61	55	54	50	55	311,819	136,931
1/14/16	53	47	46	52	48	273,766	122,179
1/15/16	71	63	64	70	65	301,410	159,800
1/16/16	87	81	85	81	84	359,330	200,778
1/17/16	85	80	88	79	84	354,698	202,045
1/18/16	79	72	81	69	76	372,040	184,577
1/19/16	67	64	71	62	67	331,243	164,060
1/20/16	55	49	55	49	52	276,157	131,550
1/21/16	53	47	48	52	49	275,349	123,662
1/22/16	53	47	50	57	50	281,048	127,035
1/23/16	51	47	50	52	50	247,209	125,224
1/24/16	41	39	42	45	41	222,607	107,363
1/25/16	44	42	46	50	45	237,261	115,301
1/26/16	49	48	56	49	52	251,300	130,199
1/27/16	44	40	47	44	44	225,768	112,900
1/28/16	56	42	49	43	47	239,312	119,651
1/29/16	46	40	45	39	43	224,950	110,475
1/30/16	38	29	35	32	33	191,295	88,851
1/31/16	37	35	40	38	38	209,605	99,114
2/1/16	42	37	42	39	40	238,321	104,656
2/2/16	51	49	49	57	50	243,108	126,258
2/3/16	60	54	62	56	58	281,429	144,862
2/4/16	57	51	55	55	54	282,751	135,481
2/5/16	52	51	55	48	53	253,812	131,778
2/6/16	40	37	44	45	41	226,987	107,384
2/7/16	49	47	50	50	49	244,045	123,885
2/8/16	69	64	69	69	68	302,175	165,224
2/9/16	73	62	69	62	66	325,709	162,401
2/10/16	69	59	66	60	64	347,331	156,568
2/11/16	66	58	64	60	62	310,099	152,759
2/12/16	80	71	76	72	74	329,587	180,212
2/13/16	69	65	69	69	68	305,595	166,176
2/14/16	59	54	56	51	55	274,711	137,861
2/15/16	45	41	43	39	42	243,334	108,751
2/16/16	62	43	50	45	49	255,833	123,867
2/17/16	54	45	51	43	49	249,704	123,257
2/18/16	38	35	38	37	37	229,752	97,696
2/19/16	31	29	34	31	31	216,650	85,443
2/20/16	36	34	36	33	35	219,627	93,041
2/21/16	43	36	34	36	36	228,315	95,232
2/22/16	42	34	35	37	36	238,340	95,262
2/23/16	36	32	35	38	35	230,513	92,166
2/24/16	43	37	40	41	39	235,825	102,946
2/25/16	49	39	42	44	43	246,493	109,875
2/26/16	40	34	38	34	37	216,973	97,025
2/27/16	28	20	23	22	23	182,329	66,055
2/28/16	53	38	36	40	40	228,066	103,342
2/29/16	62	51	47	54	51	278,419	128,986
3/1/16	58	48	60	62	57	307,329	140,982
3/2/16	45	45	52	49	49	268,728	123,538
3/3/16	49	36	40	44	40	264,523	105,014
3/4/16	43	35	39	36	38	231,098	99,664
3/5/16	40	34	37	37	36	213,132	96,237
3/6/16	26	16	28	14	22	176,094	65,225
3/7/16	32	9	12	11	14	160,398	46,265
3/8/16	23	14	15	23	17	172,244	52,816
3/9/16	32	29	31	30	30	235,889	82,734
3/10/16	32	28	31	27	30	219,043	81,153

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3/11/16	21	14	17	12	16	161,998	50,862
3/12/16	16	8	11	12	11	142,617	39,811
3/13/16	25	15	18	17	18	160,181	55,989
3/14/16	22	13	14	15	15	149,505	49,061
3/15/16	30	20	23	24	23	170,946	66,986
3/16/16	36	28	31	29	31	191,603	83,335
3/17/16	37	32	34	37	34	216,706	91,795
3/18/16	47	36	35	37	37	234,543	97,508
3/19/16	42	31	37	40	36	211,159	96,042
3/20/16	37	32	36	35	35	232,936	92,388
3/21/16	34	25	29	21	27	202,691	76,117
3/22/16	39	25	20	27	25	184,380	70,777
3/23/16	44	38	42	48	42	223,056	108,699
3/24/16	38	30	43	40	38	224,771	100,155
3/25/16	30	27	37	31	32	192,601	87,567
3/26/16	36	24	25	37	28	199,811	77,441
3/27/16	33	31	32	32	32	214,362	86,133
3/28/16	30	18	21	19	21	195,437	62,361
3/29/16	19	14	16	18	16	157,263	51,248
3/30/16	28	23	22	23	23	188,352	67,136
3/31/16	33	23	27	30	27	199,709	75,746
4/1/16	43	36	37	41	38	204,370	100,119
4/2/16	46	39	39	34	39	220,723	102,664
4/3/16	43	20	18	19	22	191,047	64,630
4/4/16	37	32	36	31	34	241,094	91,675
4/5/16	34	34	35	22	33	218,392	88,109
4/6/16	33	30	31	29	30	216,169	83,176
4/7/16	40	33	34	33	34	221,599	91,563
4/8/16	52	42	45	45	45	244,695	115,245
4/9/16	42	35	39	33	37	203,295	98,326
4/10/16	31	23	27	26	26	194,869	74,373
4/11/16	42	34	38	37	37	245,104	97,258
4/12/16	30	27	26	19	26	205,564	73,057
4/13/16	26	6	10	5	10	163,821	38,466
4/14/16	9	3	8	4	6	138,468	29,606
4/15/16	6	0	2	1	2	128,035	20,389
4/16/16	6	0	0	0	1	109,688	17,768
4/17/16	10	0	1	0	2	120,648	19,660
4/18/16	29	2	1	9	6	156,467	28,553
4/19/16	26	11	14	11	14	168,123	47,398
4/20/16	14	6	14	13	12	148,956	41,602
4/21/16	16	12	12	12	12	152,144	43,529
4/22/16	27	14	17	12	17	148,835	53,279
4/23/16	23	5	5	1	7	121,074	31,066
4/24/16	34	12	2	3	9	134,631	36,635
4/25/16	35	18	8	14	15	171,710	49,858
4/26/16	28	23	23	26	24	168,835	69,466
4/27/16	27	23	26	31	26	180,383	73,521
4/28/16	29	29	29	29	29	215,794	79,475
4/29/16	23	15	22	24	21	170,725	61,555
4/30/16	28	18	24	29	24	154,029	67,874
5/1/16	25	14	19	20	18	163,864	56,588
5/2/16	12	8	12	14	11	167,262	40,734
5/3/16	13	7	12	12	10	138,313	39,056
5/4/16	18	10	15	12	13	138,700	45,368
5/5/16	2	0	5	0	2	148,942	21,481
5/6/16	0	0	0	0	0	133,857	16,052
5/7/16	16	7	12	10	11	146,164	39,940
5/8/16	14	1	5	3	5	131,905	26,687
5/9/16	17	8	13	9	11	150,710	41,332
5/10/16	23	13	14	6	14	178,384	47,112
5/11/16	18	14	13	12	14	181,854	46,306
5/12/16	16	17	19	18	18	190,601	55,909
5/13/16	32	28	29	31	29	180,870	80,291
5/14/16	33	24	29	22	27	175,351	75,821
5/15/16	16	10	13	12	13	158,100	44,059
5/16/16	21	10	12	10	12	157,348	43,161
5/17/16	16	11	16	12	14	147,500	47,375
5/18/16	14	6	10	8	9	141,190	36,271
5/19/16	8	1	3	6	4	128,848	23,958
5/20/16	9	0	5	9	5	131,361	26,057
5/21/16	3	0	1	1	1	122,858	17,639
5/22/16	0	0	0	0	0	120,964	16,052
5/23/16	0	0	0	0	0	132,655	16,052
5/24/16	2	0	0	0	0	128,343	16,525
5/25/16	18	0	0	0	2	129,091	21,435
5/26/16	7	0	0	0	1	133,999	18,034
5/27/16	11	1	0	0	2	129,936	19,619
5/28/16	8	1	0	2	1	123,945	19,265
5/29/16	3	0	0	0	0	121,496	17,028
5/30/16	3	0	0	0	0	127,416	16,851
5/31/16	22	0	0	3	3	136,366	23,447
6/1/16	11	4	6	10	7	132,716	30,553
6/2/16	9	0	0	0	1	135,135	18,832
6/3/16	15	2	0	3	3	130,543	22,321
6/4/16	12	1	2	5	4	121,493	23,879
6/5/16	3	0	0	0	0	120,114	16,851
6/6/16	11	6	7	8	7	129,728	31,750
6/7/16	14	3	7	1	6	130,080	28,684

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6/8/16	5	0	0	0	1	125,553	17,590
6/9/16	9	0	0	0	1	138,762	18,625
6/10/16	0	0	0	0	0	145,617	16,052
6/11/16	0	0	0	0	0	134,333	16,052
6/12/16	12	0	0	0	2	123,876	19,453
6/13/16	11	0	0	0	1	142,999	19,276
6/14/16	14	0	0	0	2	144,762	20,134
6/15/16	12	0	0	0	2	155,477	19,542
6/16/16	3	0	0	0	0	148,157	16,821
6/17/16	0	0	0	0	0	151,309	16,052
6/18/16	0	0	0	0	0	150,349	16,052
6/19/16	0	0	0	0	0	126,669	16,052
6/20/16	2	0	0	0	0	159,110	16,555
6/21/16	1	0	0	0	0	149,422	16,200
6/22/16	6	0	0	0	1	150,104	17,679
6/23/16	0	0	6	0	3	155,330	21,865
6/24/16	0	0	0	0	0	143,926	16,052
6/25/16	0	0	0	0	0	138,507	16,052
6/26/16	0	0	0	0	0	146,479	16,052
6/27/16	11	0	0	0	1	144,824	19,187
6/28/16	3	0	4	0	2	160,375	21,107
6/29/16	0	0	0	0	0	155,099	16,052
6/30/16	7	0	0	3	1	147,141	18,833
Totals	8,872	7,038	7,761	7,811	7,711	65,125,236	22,870,602

* Volumes include interruptible and transportation volumes

** Design Model numbers are used to calculate firm volumes only

MINNESOTA ENERGY RESOURCES - NNG

Customer Counts by PGAC Class - July 1, 2015 through June 30, 2016

Tariff Rate Class	Rate Designation	Jul-15 Average Customers	Aug-15 Average Customers	Sep-15 Average Customers	Oct-15 Average Customers	Nov-15 Average Customers	Dec-15 Average Customers	Jan-16 Average Customers	Feb-16 Average Customers	Mar-16 Average Customers	Apr-16 Average Customers	May-16 Average Customers	Jun-16 Average Customers	Annual Average Customers
GS- Residential	MERC000001	169,036	164,816	165,258	176,318	149,508	166,955	173,435	176,720	168,129	168,859	169,135	169,628	168,150
GS-C&I <1,500 therms/yr (Small)	MERC000005	6,522	6,342	6,346	7,030	5,525	6,428	6,782	6,837	6,690	6,690	6,536	6,534	6,522
GS-C&I <1,500 therms/yr (Small) Emmons, IA	MERC000013	1	1	1	1	1	1	1	1	1	1	1	1	1
GS-C&I >1,500 therms/yr (Large)	MERC000009	9,979	9,686	9,670	10,604	8,551	9,789	10,340	10,293	9,943	9,943	10,003	9,965	9,897
GS-C&I >1,500 therms/yr (Large) Emmons, IA	MERC000014	3	3	3	3	3	3	3	3	3	3	3	3	3
Small Volume Interruptible (SVI)	MERC000015	296	298	299	295	297	301	301	272	272	93	576	241	295
Small Volume Interruptible w/Joint (SVJ)	MERC000019	3	3	3	3	3	0	6	7	7	5	6	5	4
Large Volume Interruptible (LVI)	MERC000022	61	65	62	63	61	59	58	54	54	58	100	58	63
Large Volume Interruptible w/Joint (LVJ)	MERC000026	0	0	0	0	0	0	0	0	0	0	1	2	0
Super Large Volume Interruptible (SLVI)	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0
Super Large Volume Interruptible w/Joint (SLVJ)	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		185,901	181,214	181,642	194,317	163,949	183,536	190,926	194,187	185,099	185,652	186,361	186,437	184,935

MINNESOTA ENERGY RESOURCES - NNG

Projected Storage Cost - November 2016 through March 2017

Minnesota Energy Resources Corporation

Month/ Year	K#118657 NNG Storage	LS Power K#130698 NNG Storage	LS Power K#130699 NNG Storage	Total NNG Storage	Projected NNG WACOG	K#118657 NNG Storage Cost	K#130698 NNG Storage Cost	K#130699 NNG Storage Cost	Total NNG Storage Cost	AECO Storage GLGT/VGT Centra Emerson	AECO Storage GLGT/VGT Centra Emerson WACOG	AECO Storage GLGT/VGT Centra Emerson Cost	2016-2017 Demand and Entitlement		
													NNG-ABL K#22335 NNG Storage	NNG-ABL K#22335 NNG Projected WACOG	NNG-ABL K#22335 NNG Projected Cost
Nov-16	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 1,017,396	\$ 152,523	\$ 108,945	\$ 1,278,863	85,304	\$ 1,4605	\$ 124,586	34,125	\$ 2,6571	\$ 90,674
Dec-16	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,556,532	\$ 383,262	\$ 273,758	\$ 3,213,552	231,768	\$ 1,4605	\$ 338,496	85,750	\$ 2,6571	\$ 227,848
Jan-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,556,532	\$ 383,262	\$ 273,758	\$ 3,213,552	231,768	\$ 1,4605	\$ 338,496	85,750	\$ 2,6571	\$ 227,848
Feb-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,556,532	\$ 383,262	\$ 273,758	\$ 3,213,552	209,339	\$ 1,4605	\$ 305,739	85,750	\$ 2,6571	\$ 227,848
Mar-17	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 1,017,396	\$ 152,523	\$ 108,945	\$ 1,278,863	96,374	\$ 1,4605	\$ 140,754	34,125	\$ 2,6571	\$ 90,674
Total	4,342,470	651,000	465,000	5,458,470	\$ 2,2348	\$ 9,704,387	\$ 1,454,830	\$ 1,039,164	\$ 12,198,381	854,552	\$ 1,4605	\$ 1,248,070	325,500	\$ 2,6571	\$ 864,894

Month/ Year	NNG Storage Volume	NNG Indexes Price	NNG Indexes Cost
Nov-16	572,259	\$ 2.8410	\$ 1,625,788
Dec-16	1,437,984	\$ 3.4365	\$ 4,941,632
Jan-17	1,437,984	\$ 3.8650	\$ 5,557,808
Feb-17	1,437,984	\$ 3.9095	\$ 5,621,798
Mar-17	572,259	\$ 3.4900	\$ 1,997,184
Total	5,458,470	\$ 3.6172	\$ 19,744,210

Month/ Year	AECO Storage Volume	Total AECO Market WACOG	Total AECO Market Cost
Nov-16	85,304	\$ 2.2935	\$ 195,644
Dec-16	231,768	\$ 2.3790	\$ 551,376
Jan-17	231,768	\$ 2.4475	\$ 567,252
Feb-17	209,339	\$ 2.4595	\$ 514,868
Mar-17	96,374	\$ 2.4200	\$ 233,225
Total	854,552	\$ 2.4134	\$ 2,062,364

Month/ Year	NNG-ABL Storage Volume	NNG-ABL Indexes Price	NNG-ABL Indexes Cost
Nov-16	34,125	\$ 2.8410	\$ 96,949
Dec-16	85,750	\$ 3.4365	\$ 294,680
Jan-17	85,750	\$ 3.8650	\$ 331,424
Feb-17	85,750	\$ 3.9095	\$ 335,240
Mar-17	34,125	\$ 3.4900	\$ 119,096
Total	325,500	\$ 3.6172	\$ 1,177,389

Max NNG-MERC Storage (Storage plan withdrawals through Apr 17)	5,458,470	5,869,321	09/30/16 Storage Balance - NNG-MERC	4,579,317	78.02%	4,258,766
Max AECO Storage (Storage plan withdrawals through Apr 17)	854,552	947,817	09/30/16 Storage Balance - AECO	797,474	84.14%	719,003
Max NNG-ABL Storage (Storage plan withdrawals through Apr 17)	325,500	350,000	09/30/16 Storage Balance - NNG-ABL	275,072	78.59%	255,817

Month/ Year	K#118657 NNG Storage	LS Power K#130698 NNG Storage	LS Power K#130699 NNG Storage	Total NNG Storage	Projected K#118657 NNG WACOG	Projected K#130698 NNG WACOG	Projected K#130699 NNG WACOG	WACOG NNG Cost	Projected NNG Indexes Price	Projected NNG Index Cost	Additional Storage (Savings)/ Cost
Nov-16	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 1,278,863	\$ 2.8410	\$ 1,625,788	\$ (346,925)
Dec-16	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 3,213,552	\$ 3.4365	\$ 4,941,632	\$ (1,728,080)
Jan-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 3,213,552	\$ 3.8650	\$ 5,557,808	\$ (2,344,256)
Feb-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 3,213,552	\$ 3.9095	\$ 5,621,798	\$ (2,408,246)
Mar-17	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 1,278,863	\$ 3.4900	\$ 1,997,184	\$ (718,321)
Total	4,342,470	651,000	465,000	5,458,470	\$ 2.8092	\$ 2.8092	\$ 2.8092	\$ 12,198,381	\$ 3.1285	\$ 19,744,210	\$ (7,545,829)

Month/ Year	AECO Storage	AECO Storage Other WACOG	Total AECO Cost	Projected AECO Index Price	Projected AECO Index Cost	Additional Storage (Savings)/ Cost
Nov-16	85,304	\$ 1,4605	\$ 124,586	\$ 2.2935	\$ 195,644	\$ (71,058)
Dec-16	231,768	\$ 1,4605	\$ 338,496	\$ 2.3790	\$ 551,376	\$ (212,879)
Jan-17	231,768	\$ 1,4605	\$ 338,496	\$ 2.4475	\$ 567,252	\$ (228,755)
Feb-17	209,339	\$ 1,4605	\$ 305,739	\$ 2.4595	\$ 514,868	\$ (209,130)
Mar-17	96,374	\$ 1,4605	\$ 140,754	\$ 2.4200	\$ 233,225	\$ (92,471)
Total	854,552	\$ 1,4605	\$ 1,248,070	\$ 2.4134	\$ 2,062,364	\$ (814,294)

Month/ Year	NNG-ABL K#22335 NNG Storage	K#22335 NNG Projected WACOG	K#22335 NNG Projected Cost	NNG-ABL Indexes Price	NNG-ABL Indexes Cost	Additional Storage (Savings)/ Cost
Nov-16	34,125	\$ 2,6571	\$ 90,674	\$ 2.8410	\$ 96,949	\$ (6,275)
Dec-16	85,750	\$ 2,6571	\$ 227,848	\$ 3.4365	\$ 294,680	\$ (66,831)
Jan-17	85,750	\$ 2,6571	\$ 227,848	\$ 3.8650	\$ 331,424	\$ (103,575)
Feb-17	85,750	\$ 2,6571	\$ 227,848	\$ 3.9095	\$ 335,240	\$ (107,391)
Mar-17	34,125	\$ 2,6571	\$ 90,674	\$ 3.4900	\$ 119,096	\$ (28,422)
Total	325,500	\$ 2,6571	\$ 864,894	\$ 3.6172	\$ 1,177,389	\$ (312,495)

*Indexes and projected WACOG based on 10/24/16 market prices

In the Matter of the Petition of Minnesota
Energy Resources Corporation for Approval of
a Change in Demand Entitlement for its NNG-
System

Docket No. G011/M-16-650

CERTIFICATE OF SERVICE

I, Kristin M. Stastny, hereby certify that on the 1st day of November, 2016, on behalf of Minnesota Energy Resources Corporation (MERC) I electronically filed a true and correct copy of MERC's Updates to its Petition for Approval of a Change in Demand Entitlement on www.edockets.state.mn.us. Said documents were also served via U.S. mail and electronic service as designated on the attached service list.

Dated this 1st day of November, 2016.

/s/ Kristin M. Stastny
Kristin M. Stastny

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Casey	Whelan	cwhelan@usenergyservices.com	U.S. Energy Services, Inc.	605 Highway 169 N Ste 1200 Plymouth, MN 55441	Electronic Service	No	OFF_SL_16-650_M-16-650
Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	Yes	OFF_SL_16-650_M-16-650

MINNESOTA ENERGY RESOURCES - NNG

DESIGN-DAY DEMAND SUMMARY

NOVEMBER 1, 2016

NNG

Design Day Requirement		248,796
Total Peak Day Entitlement		252,127
2015/16 Firm Peak Day Actual Sendout	1/17/2016	204,444
Firm Annual Throughput - Minnesota		22,173,564
No. of Firm Customers		184,577
Department Load Factor Calculation		29.71%

MINNESOTA ENERGY RESOURCES - NNG

NNG MINNESOTA DESIGN DAY REQUIREMENTS

NOVEMBER 1, 2016

NNG

Pipeline Group	2015/16 Customer Count	Zone Total Customer Count	1/20 Design DDD	Regression Factors		Regression Total	Regression Adjustment	1/20 Requirements Regression Load	Estimated Contract Demand Units	Total *
				Intercept	Slope					

PEAK										
NNG	184,577	184,577	98	16,052	2,204	233,977	14,724	248,701	95	248,796
Total	184,577	184,577								248,796

OFF PEAK										
NNG	184,577	184,577	55	16,052	2,204	137,251	14,724	151,975	95	152,070
Total	184,577	184,577								152,070

* Adjusted for customer growth

MINNESOTA ENERGY RESOURCES - NNG

**DESIGN-DAY DEMAND PER CUSTOMER - GS
 NOVEMBER 1, 2016**

NNG

<u>Heating Season</u>	<u>No. of Firm Customers</u>	<u>Design Day Requirements</u>	<u>MMBtu /Customer /Day</u>
16/17	184,577	248,796	1.35
15/16	181,326	245,263	1.35
14/15	178,388	261,002	1.46
13/14	178,578	245,878	1.38
12/13	176,937	225,883	1.28
11/12	175,241	235,055	1.34
10/11	176,027	218,213	1.24
09/10	175,228	228,040	1.30
08/09	173,962	247,188	1.42
07/08	172,116	223,754	1.30

MINNESOTA ENERGY RESOURCES - NNG

SUMMER/WINTER USAGE - Mcf
PROJECTED 12 MONTHS ENDING JUNE 2017
NNG

<u>Class</u>	<u>Summer Apr-Oct</u>	<u>Winter Nov-Mar</u>	<u>Total</u>
GS	5,816,438	16,341,713	22,158,151
SVI	469,909	1,163,282	1,633,191
SVJ	5,815	9,598	15,413
LVI	421,480	515,258	936,738
LVJ	0	0	0
SLV	0	0	0
Total	<u>6,713,642</u>	<u>18,029,851</u>	<u>24,743,493</u>

MINNESOTA ENERGY RESOURCES - NNG

ENTITLEMENT LEVELS

PROPOSED TO BE EFFECTIVE NOVEMBER 1, 2016

<u>Capacity Type</u>	<i>Summer</i>			<i>April/October</i>			<i>Winter</i>		
	<u>2015/16</u> <u>MMBtu</u>	<u>Change</u> <u>MMBtu</u>	<u>Proposed</u> <u>MMBtu</u>	<u>2015/16</u> <u>MMBtu</u>	<u>Change</u> <u>MMBtu</u>	<u>Proposed</u> <u>MMBtu</u>	<u>2015/16</u> <u>MMBtu</u>	<u>Change</u> <u>MMBtu</u>	<u>Proposed</u> <u>MMBtu</u>
TF-12 Base & Variable	75,316	0	75,316	75,316	0	75,316	75,316	0	75,316
TF5	0	0	0	0	0	0	32,278	0	32,278
TFX - 12	32,297	0	32,297	32,297	0	32,297	32,297	0	32,297
TFX - 5	0	0	0	0	0	0	108,701	0	108,701
TFX- (Apr/Oct) Offpeak*	0	0	0	2,000	0	2,000	0	0	0
Bison	50,000	0	50,000	50,000	0	50,000	50,000	0	50,000
NBPL	50,000	0	50,000	50,000	0	50,000	50,000	0	50,000
Northwest Gas (Windom)	2,500	0	2,500	2,500	0	2,500	2,500	0	2,500
Northwestern Energy (Ortonville)	1,035	0	1,035	1,035	0	1,035	1,035	0	1,035
NNG Zone Delivery Call Option	0	0	0	0	0	0	0	0	0
Total	111,148	0	111,148	113,148	0	113,148	252,127	0	252,127
Heating Season Forecasted Design Day-Adjusted							245,263	3,533	248,796
Non-Heating Season Forecasted Design Day				147,001	5,069	152,070			
Heating Season Capacity Surplus/Shortage							6,864	(3,533)	3,331
Non-Heating Season Capacity Surplus/Shortage				(33,853)	(5,069)	(38,922)			
*Not included in Heating Season Total entitlement									
Reserve Margin			N3	-23.03%	-2.57%	-25.59%	2.80%	-1.46%	1.34%

MINNESOTA ENERGY RESOURCES - NNG

**RATE IMPACT OF THE PROPOSED DEMAND CHANGE
NOVEMBER 1, 2016**

All costs in \$/Dth	Base Cost of Gas G011/MR15-748 Jan 1, 2016	Demand Charge Oct 1, 2015	Demand Charge Demand Filing Nov 1, 2015	Most Recent PGA Oct 1, 2016	Proposed Effective Nov 1, 2016	Result of Proposed Change				
						Change from Last Rate Case	Change from Nov 1, 2015 Demand Filing	Change from Last PGA %	Change from Last PGA \$	
1) General Service Residential: Avg. Annual Use:		76	Dth							
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)	
Demand Cost	\$0.9226	\$0.9947	\$0.9003	\$0.9317	\$0.9319	\$0.0093	\$0.0316	0.02%	\$0.0002	
Commodity Margin	\$2.1806	\$2.1806	\$2.1806	\$2.3980	\$2.3980	\$0.2174	\$0.2174	0.00%	\$0.0000	
Total Cost of Gas	\$7.4249	\$6.6639	\$6.4688	\$6.6830	\$6.3981	(\$1.0268)	(\$0.0707)	-4.26%	(\$0.2849)	
Avg Annual Cost	\$564.29	\$506.46	\$491.63	\$507.91	\$486.25	(\$78.04)	(\$5.38)	-4.26%	(\$21.66)	
Effect of proposed commodity change on average annual bills:									(\$21.67)	
Effect of proposed demand change on average annual bills:									\$0.01	
2) Small Vol. Interruptible: Avg. Annual Use:		4,508	Dth							
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)	
Demand Cost										
Commodity Margin	\$0.8490	\$0.8490	\$0.8490	\$0.9336	\$0.9336	\$0.0846	\$0.0846	0.00%	\$0.0000	
Total Cost of Gas	\$5.1707	\$4.3376	\$4.2369	\$4.2869	\$4.0018	(\$1.1689)	(\$0.2351)	-6.65%	(\$0.2851)	
Avg Annual Cost	\$23,309.52	\$19,553.90	\$19,099.95	\$19,325.35	\$18,040.11	(\$5,269.40)	(\$1,059.83)	-6.65%	(\$1,285.23)	
Effect of proposed commodity change on average annual bills:									(\$1,285.23)	
Effect of proposed demand change on average annual bills:									\$0.00	
3) Large Vol. Interruptible: Avg. Annual Use:		12,372	Dth							
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)	
Demand Cost										
Commodity Margin	\$0.4553	\$0.4553	\$0.4553	\$0.5007	\$0.5007	\$0.0454	\$0.0454	0.00%	\$0.0000	
Total Cost of Gas	\$4.7770	\$3.9439	\$3.8432	\$3.8540	\$3.5689	(\$1.2081)	(\$0.2743)	-7.40%	(\$0.2851)	
Avg Annual Cost	\$59,101.04	\$48,793.93	\$47,548.07	\$47,681.69	\$44,154.43	(\$14,946.61)	(\$3,393.64)	-7.40%	(\$3,527.26)	
Effect of proposed commodity change on average annual bills:									(\$3,527.26)	
Effect of proposed demand change on average annual bills:									\$0.00	
4) Small Vol. Firm: Avg. Annual Use:		4,508	Dth							
		25	DTh							
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)	
Demand Cost	\$10.1722	\$10.3446	\$10.0707	\$10.2650	\$10.2670	\$0.0000	\$0.1963	0.02%	\$0.0020	
Commodity Margin	\$0.8490	\$1.0647	\$0.8490	\$0.9336	\$0.9336	\$0.0846	\$0.0846	0.00%	\$0.0000	
Demand Margin	\$2.5000	\$2.5000	\$2.5000	\$2.7493	\$2.7493	\$0.2493	\$0.2493	0.00%	\$0.0000	
Total Cost of Gas	\$5.1707	\$4.5533	\$4.2369	\$4.2869	\$4.0018	(\$1.1689)	(\$0.2351)	-6.65%	(\$0.2851)	
Total Demand Cost	\$12.6722	\$12.8446	\$12.5707	\$13.0143	\$13.0163	\$0.3441	\$0.4456	0.02%	\$0.0020	
Avg Annual Cost	\$23,626.32	\$20,847.39	\$19,414.21	\$19,650.70	\$18,365.52	(\$5,260.80)	(\$1,048.69)	-6.54%	(\$1,285.18)	
Effect of proposed commodity change on average annual bills:									(\$1,285.23)	
Effect of proposed demand change on average annual bills:									\$0.05	
5) Large Vol. Firm: Avg. Annual Use:		12,372	Dth							
		75	DTh							
Commodity Cost	\$4.3217	\$3.4886	\$3.3879	\$3.3533	\$3.0682	(\$1.2535)	(\$0.3197)	-8.50%	(\$0.2851)	
Demand Cost	\$10.1722	\$10.3446	\$10.0707	\$10.2650	\$10.2670	\$0.0948	\$0.1963	0.02%	\$0.0020	
Commodity Margin	\$0.4553	\$0.4553	\$0.4553	\$0.5007	\$0.5007	\$0.0454	\$0.0454	0.00%	\$0.0000	
Demand Margin	\$2.5000	\$2.5000	\$2.5000	\$2.7493	\$2.7493	\$0.0000	\$0.2493	0.00%	\$0.0000	
Total Cost of Gas	\$4.7770	\$3.9439	\$3.8432	\$3.8540	\$3.5689	(\$1.2081)	(\$0.2743)	-7.40%	(\$0.2851)	
Total Demand Cost	\$12.6722	\$12.8446	\$12.5707	\$13.0143	\$13.0163	\$13.0163	\$0.4456	0.02%	\$0.0020	
Avg Annual Cost	\$60,051.46	\$49,757.28	\$48,490.87	\$48,657.76	\$45,130.66	(\$13,970.39)	(\$3,360.22)	-7.25%	(\$3,527.10)	
Effect of proposed commodity change on average annual bills:									(\$3,527.26)	
Effect of proposed demand change on average annual bills:									\$0.15	

Note: Average Annual Average based on NNG Annual Automatic Adjustment Report in Docket No. E,G999/AA-16-524

MINNESOTA ENERGY RESOURCES - NNG
RATE IMPACT OF THE PROPOSED DEMAND CHANGE

NOVEMBER 1, 2016
NNG

IV. NORTHERN NATURAL GAS COMPANY'S RATES -- CURRENT COST OF GAS EFFECTIVE							01-Nov-16
	Tariff-Summer(7 mths)	Tariff-Winter(5 mths)	Wt. Annual	GRI	Total		
TF-12B	112495 \$ 5.6830	\$ 10.2300	\$7.5776	\$0.0000	\$7.5776		
TF-12B Discount	112495 \$ 5.6830	\$ 10.0320	\$7.4951	\$0.0000	\$7.4951		
TF-12V	112495 \$ 5.6830	\$ 13.8660	\$9.0926	\$0.0000	\$9.0926		
TF-5	112495 \$ -	\$ 15.1530	\$15.1530	\$0.0000	\$15.1530		
TFX	112486 \$ 5.6830	\$ 15.1530	\$9.6288	\$0.0000	\$9.6288		
TFX-5	112486 \$ -	\$ 15.1530	\$15.1530	\$0.0000	\$15.1530		
TFX-5 Discount	112486 \$ -	\$ 10.0320	\$10.0320	\$0.0000	\$10.0320		
TFX - Discount	111866 \$ 2.2192	\$ 15.1392	\$7.6025	\$0.0000	\$7.6025		
TFX - Discount	111866 \$ 4.8640	\$ 4.8640	\$4.8640	\$0.0000	\$4.8640		
TFX - Discount	111866 \$ 5.4720	\$ 5.4720	\$5.4720	\$0.0000	\$5.4720		
TFX-5	127852 \$ -	\$ 15.1530	\$15.1530	\$0.0000	\$15.1530		
Gas Cost					\$2,244 /Dth		

V. ANNUAL SALES -- As approved in Docket No. G011/MR-15-748

253,351,745

VI. MERC-NNG'S CURRENT COST OF GAS EFFECTIVE:

01-Nov-16

A. GS-NNG		Contract #(s)	Monthly Entitlements (Dth)	Months	Rate (\$/Dth)	Contract Costs	Contract Rate/Therm
TF12B (Max Rate) Winter	112495	39,826	5	\$ 10.2300	=	\$2,037,100	\$ 0.00905
TF12B (Max Rate) Summer	112495	39,826	7	\$ 5.6830	=	\$1,584,318	\$ 0.00704
TF12V (Max Rate)	112495	30,290	12	\$ 9.0926	=	\$3,304,978	\$ 0.01469
TF5 (Max Rate)	112495	32,278	5	\$ 15.1530	=	\$2,445,543	\$ 0.01087
TF12B (Discount-Winter)	112495	5,200	12	\$ 7.4951	=	\$467,694	\$ 0.00208
TFX12 (Max Rate)	112486	10,822	12	\$ 9.6288	=	\$1,250,434	\$ 0.00556
TFX Apr (Max Rate)	112486	2,000	1	\$ 5.6830	=	\$11,366	\$ 0.00005
TFX Oct (Max Rate)	112486	2,000	1	\$ 5.6830	=	\$11,366	\$ 0.00005
TFX5 (Max Rate)	112486	81,888	5	\$ 15.1530	=	\$6,204,244	\$ 0.02757
TFX5 (Discount)	112486	1,800	5	\$ 10.0320	=	\$90,288	\$ 0.00040
TFX12 (Discount)	111866	1,283	12	\$ 4.8640	=	\$74,886	\$ 0.00033
TFX12 (Discount)	111866	8,271	12	\$ 5.4720	=	\$543,107	\$ 0.00241
TFX12 (Discount)	111866	11,921	12	\$ 7.6025	=	\$1,087,553	\$ 0.00483
TFX5 (Discount)	111866	379	5	\$ 4.8640	=	\$9,217	\$ 0.00004
TFX5 (Discount)	111866	2,445	5	\$ 5.4720	=	\$66,895	\$ 0.00030
TFX5 (Discount)	111866	22,189	5	\$ 15.1392	=	\$1,679,619	\$ 0.00746
Windom	118657	2,500	12	\$ -	=	\$0	\$ -
Northwestern Energy		1,035	12	\$ 8.3382	=	\$103,560	\$ 0.00046
Total Demand Cost						\$20,972,168	\$ 0.09319
As approved in Docket No. G011/MR-15-748							225,057,235
GS-1 Demand Current Cost of Gas/therm							\$ 0.09319
GS-1 Commodity Current Cost of Gas/therm							\$ 0.30682
Total GS-1 Current Cost of Gas/therm							\$ 0.40001

B. GS-NNG, SVI-NNG, LVI-NNG, SJ-NNG, LJ-NNG, SLV-Commodity

	Contract #(s)	Monthly Entitlement (Dth)	Months	Rate (\$/Dth)	Contract Costs	Contract Rate (\$/therm)	
FDD: FDD - Reservation	118657	75,437	12	\$ 1.7140	=	\$1,551,588	\$ 0.00612
FDD - Storage Cycle	118657	869,864	5	\$ 0.3567	=	\$1,551,402	\$ 0.00612
FDD - Reservation	118657	5,550	12	\$ 3.3157	=	\$220,826	\$ 0.00087
FDD - Storage Cycle	118657	64,000	5	\$ 0.6901	=	\$220,832	\$ 0.00087
FDD - Reservation	130698	12,141	12	\$ 1.7140	=	\$249,716	\$ 0.00099
FDD - Storage Cycle	130698	140,000	5	\$ 0.3567	=	\$249,690	\$ 0.00099
FDD - Reservation	130699	8,672	12	\$ 1.7140	=	\$178,366	\$ 0.00070
FDD - Storage Cycle	130699	100,000	5	\$ 0.3567	=	\$178,350	\$ 0.00070
Firm Deferred Delivery Storage Contracts						\$4,400,770	\$ 0.01737

Per Docket No. G-007/M-07-1402-05 dated August 6, 2014, storage demand charges will be allocated through the commodity charge effective 11/1/2014.

	Contract #(s)	Monthly Entitlement (Dth)	Months	Rate (\$/Dth)	Contract Costs	Contract Rate (\$/therm)	
Bison	FT0003	50,000	12	\$ 17.4896	=	\$10,493,750	\$ 0.04142
NBPL	T8673F	50,000	12	\$ 6.9958	=	\$4,197,500	\$ 0.01657
						\$14,691,250	\$ 0.05799

Per Docket No. G-007/M-10-1166 and G-011/M-10-1168 dated January 26, 2015, recover the costs associated with Bison contract through commodity effective

	Annual Sales (Dth)	Rate (\$/Dth)	Commodity Cost	Rate Case Sales (therm)	Rate (\$/therm)
CD-1 Commodity	25,335,175	\$2.2444	\$56,862,266	253,351,745	\$ 0.22444
SMS-Bal Service	272,160	\$2.1800	\$593,309	253,351,745	\$ 0.00234
Physical Forward Start Premium			\$175,451	253,351,745	\$ 0.00069
Call Option Premium			\$1,010,681	253,351,745	\$ 0.00399

GS-NNG, SVI-NNG, LVI-NNG, SJ-NNG, LJ-NNG, SLV Commodity Current Cost of Gas/therm

\$63,042,477

253,351,745

\$ 0.30682

MINNESOTA ENERGY RESOURCES - NNG

RATE IMPACT OF THE PROPOSED DEMAND CHANGE

NOVEMBER 1, 2016

NNG

COSTS ASSIGNED IN JOINT RATE:							
	<u>Units</u>	<u>Contract #</u>	<u>Month</u>	<u>\$/Dth</u>		<u>Cost</u>	<u>\$/therm</u>
TF12B (Max Rate) Winter	39,826	112495	5	\$10.2300	=	\$2,037,100	\$0.09973
TF12B (Max Rate) Summer	39,826	112495	7	\$5.6830	=	\$1,584,318	\$0.07756
TF12V (Max Rate)	30,290	112495	12	\$9.0926	=	\$3,304,978	\$0.16180
TF5 (Max Rate)	32,278	112495	5	\$15.1530	=	\$2,445,543	\$0.11972
TF12B (Discount-Winter)	5,200	112495	12	\$7.4951	=	\$467,694	\$0.02290
TFX12 (Max Rate)	10,822	112486	12	\$9.6288	=	\$1,250,434	\$0.06122
TFX Apr (Max Rate)	2,000	112486	1	\$5.6830	=	\$11,366	\$0.00056
TFX Oct (Max Rate)	2,000	112486	1	\$5.6830	=	\$11,366	\$0.00056
TFX5 (Max Rate)	81,888	112486	5	\$15.1530	=	\$6,204,244	\$0.30373
TFX5 (Discount)	1,800	112486	5	\$10.0320	=	\$90,288	\$0.00442
TFX12 (Discount)	1,283	111866	12	\$4.8640	=	\$74,886	\$0.00367
TFX12 (Discount)	8,271	111866	12	\$5.4720	=	\$543,107	\$0.02659
TFX12 (Discount)	11,921	111866	12	\$7.6025	=	\$1,087,553	\$0.05324
TFX5 (Discount)	379	111866	5	\$4.8640	=	\$9,217	\$0.00045
TFX5 (Discount)	2,445	111866	5	\$5.4720	=	\$66,895	\$0.00327
TFX5 (Discount)	22,189	111866	5	\$15.1392	=	\$1,679,619	\$0.08223
Windom	2,500	118657	12	\$0.0000	=	\$0	\$0.00000
Northwestern Energy	1,035		12	\$8.3382	=	\$103,560	\$0.00507
TOTAL						\$20,972,169	
Annualized Entitlement						20,426,710	
Demand Component						<u>\$1,02670</u>	\$1.02670

MINNESOTA ENERGY RESOURCES - NNG

**Financial Options
 Heating Season 2016-2017**

[TRADE SECRET DATA BEGINS

Units - Gas Daily Peaker Packages (Physical)

<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Daily Total</u>	<u>Term Total</u>
<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>		
N/A		N/A		N/A		N/A		N/A		-	-

Premium - Gas Daily Peaker (Monthly Cost)

<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Option Premium</u>	<u>Total Premium Cost</u>
<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>		
N/A		N/A		N/A		N/A		N/A			

Units - Futures (Daily Volume)

	<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Term Total</u>
	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	
1	05/18/16	1,823	05/26/16	1,262	05/25/16	2,788	05/19/16	2,801	05/23/16	2,028	321,535
2	06/02/16	1,302	05/26/16	1,010	06/20/16	2,788	06/14/16	2,801	05/23/16	253	243,084
3	07/07/16	781	06/22/16	2,272	07/22/16	2,281	07/13/16	1,401	06/16/16	2,028	266,659
4	07/07/16	521	07/26/16	1,767	08/22/16	2,281	07/13/16	1,120	07/18/16	1,774	227,494
5	08/02/16	1,302	08/25/16	1,767	09/19/16	2,028	08/04/16	1,120	08/08/16	1,521	235,218
6	09/07/16	1,302	09/26/16	1,767	10/18/16	2,028	08/04/16	1,120	09/15/16	1,267	227,361
7	10/05/16	1,302	10/24/16	1,767	01/00/00	-	09/09/16	1,961	09/15/16	253	156,604
8							10/11/16	1,961	10/13/16	1,521	102,045
9											
10											
Total		8,333		11,613		14,194		14,286		10,645	1,780,000

Units - Call Options (Daily Volume)

	<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Term Total</u>
	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	
1	05/24/16	3,138	05/20/16	4,259	05/19/16	5,024	05/25/16	2,521	05/18/16	3,802	570,373
2	06/17/16	3,138	06/15/16	4,008	06/13/16	5,024	05/26/16	2,521	06/01/16	3,802	562,607
3	07/21/16	3,138	07/15/16	4,008	07/11/16	4,773	06/21/16	5,042	07/06/16	3,802	625,407
4	08/09/16	2,615	08/05/16	4,008	08/03/16	4,773	07/25/16	4,762	08/01/16	3,295	586,158
5	09/15/16	2,615	09/09/16	3,758	09/08/16	4,522	08/23/16	4,762	09/06/16	3,295	570,604
6	10/03/16	2,354	10/12/16	3,507	10/07/16	4,271	09/20/16	2,801	10/17/16	3,295	492,302
7							09/20/16	1,681			47,059
8							10/20/16	4,482			125,490
Total		17,000		23,548		28,387		28,571		21,290	3,580,000

Premium - Call Option (Monthly Cost)

	<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Option Premium</u>	<u>Total Premium Cost</u>
	<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>	<u>Option Premium</u>	<u>Premium Cost</u>		
1	\$ 0.1840	\$ 17,324	\$ 0.2420	\$ 31,949	\$ 0.2580	\$ 40,184	\$ 0.3300	\$ 23,294	\$ 0.3600	\$ 42,429	\$ 0.2721	\$ 155,180
2	\$ 0.2020	\$ 19,019	\$ 0.2410	\$ 29,946	\$ 0.2860	\$ 44,545	\$ 0.3500	\$ 24,706	\$ 0.3680	\$ 43,371	\$ 0.2872	\$ 161,587
3	\$ 0.1800	\$ 16,948	\$ 0.2750	\$ 34,170	\$ 0.2750	\$ 40,690	\$ 0.3470	\$ 48,988	\$ 0.4530	\$ 53,389	\$ 0.3105	\$ 194,186
4	\$ 0.1450	\$ 11,377	\$ 0.2560	\$ 31,809	\$ 0.3000	\$ 44,389	\$ 0.3400	\$ 45,333	\$ 0.3530	\$ 36,056	\$ 0.2883	\$ 168,965
5	\$ 0.1540	\$ 12,083	\$ 0.1700	\$ 19,803	\$ 0.3080	\$ 43,175	\$ 0.3640	\$ 48,533	\$ 0.3500	\$ 35,750	\$ 0.2793	\$ 159,344
6	\$ 0.0860	\$ 6,073	\$ 0.1500	\$ 16,309	\$ 0.2960	\$ 39,187	\$ 0.3270	\$ 25,647	\$ 0.3400	\$ 34,729	\$ 0.2477	\$ 121,944
7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.3260	\$ 15,341	\$ -	\$ -	\$ 0.3260	\$ 15,341
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.2720	\$ 34,133	\$ -	\$ -	\$ 0.2720	\$ 34,133
Total	\$ 0.1624	\$ 82,824	\$ 0.2246	\$ 163,986	\$ 0.2866	\$ 252,171	\$ 0.3325	\$ 265,976	\$ 0.3723	\$ 245,724	\$ 0.2823	\$ 1,010,681

Units - Collar Floor (put)

No Puts were purchased.

16/17 Winter Portfolio Plan - NNG MERC Hedging Plan

10,000 Contract Size

System	Purchase Month	Nov-16		Dec-16		Jan-17		Feb-17		Mar-17		Total		Percent of Requirements
		Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	
MN Requirements			2,582,959		3,698,468		4,405,045		4,006,697		3,336,682		18,029,851	18,029,851
NNG -MERC			86,099		119,305		142,098		143,096		107,635		119,403	
10% Futures			258,296		369,847		440,505		400,670		333,668		1,802,985	
20% Call			516,592		739,694		881,009		801,339		667,336		3,605,970	
30% Storage			774,888		1,109,540		1,321,514		1,202,009		1,001,005		5,408,955	
40% Index			1,033,184		1,479,387		1,762,018		1,602,679		1,334,673		7,211,940	
Futures Contracts	May-16	5	50,000	6	60,000	8	80,000	7	70,000	6	60,000	32	320,000	
	Jun-16	4	40,000	6	60,000	8	80,000	7	70,000	6	60,000	31	310,000	
	Jul-16	4	40,000	6	60,000	7	70,000	7	70,000	6	60,000	30	300,000	
	Aug-16	4	40,000	6	60,000	7	70,000	7	70,000	5	50,000	29	290,000	
	Sep-16	4	40,000	6	60,000	7	70,000	6	60,000	5	50,000	28	280,000	
	Oct-16	4	40,000	6	60,000	7	70,000	6	60,000	5	50,000	28	280,000	
	Total	25	250,000	36	360,000	44	440,000	40	400,000	33	330,000	178	1,780,000	9.87%
Call Options	May-16	9	90,000	13	130,000	15	150,000	14	140,000	11	110,000	62	620,000	
	Jun-16	9	90,000	12	120,000	15	150,000	14	140,000	11	110,000	61	610,000	
	Jul-16	9	90,000	12	120,000	15	150,000	13	130,000	11	110,000	60	600,000	
	Aug-16	8	80,000	12	120,000	15	150,000	13	130,000	11	110,000	59	590,000	
	Sep-16	8	80,000	12	120,000	14	140,000	13	130,000	11	110,000	58	580,000	
	Oct-16	8	80,000	12	120,000	14	140,000	13	130,000	11	110,000	58	580,000	
	Total	51	510,000	73	730,000	88	880,000	80	800,000	66	660,000	358	3,580,000	19.86%
Collars	May-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Jun-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Jul-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Aug-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Sep-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Oct-16	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Index (back financial)	Total		760,000		1,090,000		1,320,000		1,200,000		990,000		5,360,000	29.73%
Physical Hedges			0		0		0		0		0		0	
Storage			552,759		1,388,984		1,388,984		1,388,984		552,759		5,272,469	29.24%
Prepaid Obl			0		0		0		0		0		0	0.00%
Term Index			50.82%		67.03%		61.50%		64.62%		46.24%		58.97%	58.97%
		0	0	0	0	0	0	0	0	0	0	0	0	0.00%
		0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Total NNG MN													1,780,000	9.87%
Futures													3,580,000	19.86%
Call Options													0	0.00%
Costing Collar													5,272,469	29.24%
Storage													0	0.00%
Prepaid Obl													0	0.00%
Term Index													0	0.00%
Month/Daily													7,397,382	41.03%
Total													18,029,851	100.00%

NOTE:

MINNESOTA ENERGY RESOURCES

**NNG WINTER PLAN
 NOVEMBER, 2015 THROUGH MARCH, 2016**

<u>PHYSICAL FIXED PRICE HEDGES</u>	<u>Deal #</u>	<u>Trigger Locked</u>	<u>Trigger Exercised</u>	<u>Receipt Point</u>	<u>Nov</u>	<u>Dec</u>	<u>Daily Volumes</u>			<u>Monthly Total</u>
							<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	
No Physical Fixed Price Hedges										-
Total Actual Fixed/Option Physical										
					-	-	-	-	-	-

INDEX

<u>Contract Number</u>	<u>Date</u>	<u>Receipt Point</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Total</u>
40710	8/25/2016	NNG Ventura	10,000	10,000	10,000	10,000	10,000	1,510,000
40717	8/25/2016	NNG Carlton	6,628	6,628	6,628	6,628	6,628	1,000,828
40707	8/25/2016	GRLKS/NNG Grand Rapid	-	1,000	1,000	1,000		90,000
40687	8/25/2016	GRLKS/NNG Grand Rapid	-	5,000	5,000	5,000		450,000
40705	8/25/2016	NBPL Port of Morgan	20,000	20,000	20,000	20,000	20,000	3,020,000
40763	8/25/2016	NBPL Port of Morgan	30,000	30,000	30,000	30,000	30,000	4,530,000
Total Actual Seasonal Index			66,628	72,628	72,628	72,628	66,628	10,600,828

GAS DAILY PACKAGES

<u>Physical Call Option</u>	40722	8/25/2016	NNG-GRLKS/NNGCarlton	5,000	5,000	5,000	5,000	5,000
<u>Physical Call Option</u>	40715	8/25/2016	NNG Ventura	10,000	10,000	10,000	10,000	10,000
<u>Physical Call Option</u>	40718	8/25/2016	NNG Ventura	-	5,500	5,500	5,500	-
<u>Physical Call Option</u>	40720	8/25/2016	NNG Ventura	10,000	10,000	10,000	10,000	10,000
<u>Physical Call Option</u>	40721	8/25/2016	NNG Ventura	-	10,000	10,000	10,000	-
<u>Physical Call Option</u>	40723	8/25/2016	NNG Ventura	-	4,500	4,500	4,500	-

STORAGE

	<u>Contract #</u>	<u>Contract #</u>	<u>Contract #</u>	<u>Total Volume Injected</u>
	<u>118657</u>	<u>130698</u>	<u>130699</u>	<u>Volume Injected</u>
May - balance forward	650,000	0	0	650,000
June	915,553	137,255	98,039	1,150,847
July	946,072	141,830	101,307	1,189,209
August	946,072	141,830	101,307	1,189,209
Sept	915,553	137,255	98,039	1,150,847
Oct (est)	296,071	141,830	101,307	539,208
Total	4,669,321	700,000	499,999	5,869,320

MINNESOTA ENERGY RESOURCES - NNG

	2012 NNG GS	2013 NNG GS	2014 NNG GS	2015 NNG GS	2016 NNG GS	Proposed Change
Design Day	200,785	245,878	261,002	245,263	248,796	3,533
Customer Requirements moving to Transportation 2005-6						
Adjusted Design Day						
Design Day Percentages	38.29%	28.43%	28.07%	32.40%	29.71%	-2.69%
Total Design Day Capacity (includes non-recallable capacity)	208,007	256,385	266,385	252,127	252,127	0
Less: Windom	2,500	2,500	2,500	2,500	2,500	0
Less: Northwestern Energy	910	910	910	1,035	1,035	0
Total Design Day Capacity	204,597	252,975	262,975	248,592	248,592	0
Factors for All Winter Capacity	100.00%	100.00%	100.00%	100.00%	100.00%	

Allocated Entitlements in PGA

TF12B	41,156					0
TF12V	25,820					0
TF5	28,704					0
TFX12	28,721					0
TFX(5)	80,197					0
TFX (October Only)	1,779					0
TFX (April Only)	1,779					0
NNG Zone Delivery Call Option	0					0
Bison *	44,463					0
NBPL *	44,463					0
Peak Capacity	205,508					0
Total Allocated Entitlements in PGA	297,082	0	0	0	0	0

* Bison/NBPL does not add incremental capacity but is utilized to deliver Rockies supply to NNG. Volume is not included in Peak Capacity.

Direct Assigned Entitlements in PGA

TF12B		49153	55,019	45,026	45,026	0
TF12V		26926	21,060	30,290	30,290	0
TF5		31515	31,515	32,278	32,278	0
TFX12		32297	32,297	32,297	32,297	0
TFX(5)		93084	123,084	108,701	108,701	0
TFX(5) (12-V)						0
TFX (April Only)		2000	2,000	2,000	2,000	0
TFX (October Only)		2000	2,000	2,000	2,000	0
Windom	2,500	2,500	2,500	2,500	2,500	0
Northwestern Energy	910	910	910	1,035	1,035	0
NNG Zone Delivery Call Option		20,000	0	0	0	0
Bison *		50,000	50,000	50,000	50,000	0
NBPL *		50,000	50,000	50,000	50,000	0
Total Direct Assignments	3,410	123,410	266,385	252,127	252,127	0
Total Capacity before Peak Shaving	208,918	123,410	266,385	252,127	252,127	0
LP Peak Shaving	0					0
Total Design Day Capacity	208,918	123,410	266,385	252,127	252,127	0
Total Annual Transportation	99,107	3,410	3,410	111,148	111,148	0
Total Seasonal Transportation	108,901	0	154,599	140,979	140,979	0
Total Percent Seasonal	52.1%	0.0%	58.0%	55.9%	55.9%	0.0%
Reserve Margin	4.05%	-49.81%	2.06%	2.80%	1.34%	-1.5%

Direct Assigned Demand Not in PGA

TF-12-B Contract Demand	0	0	0	0	0	0
Total Design Day Capacity w/ contract demand	208,007	256,385	266,385	252,127	252,127	0
Factors	38.29%	28.43%	28.07%	32.40%	29.71%	-2.69%

Other Entitlements not included in Peak Day Deliverability

TFX Oct	1,779	2,000	2,000	2,000	2,000	0
TFX Apr	1,779	2,000	2,000	2,000	2,000	0
FDD Storage Reservation	86,671	97,463	94,863	94,863	101,800	6,937
FDD Storage Capacity	999,411	1,123,864	1,093,864	1,093,864	1,093,864	0
FDD Maximum Storage Quantity	4,997,056	5,619,321	5,469,321	5,469,321	5,469,321	0
SMS	20,168	22,680	22,680	22,680	272,160	249,480

MINNESOTA ENERGY RESOURCES - NNG

Change in Costs due to November 1, 2016 Change in Entitlement Levels and Related Demand Costs

Costs Assigned In Demand

Contract	2015/16 Entitlements	2016/17 Entitlements	Entitlement Change	Months	2016/17 Rate	2015/16 Total Annual Cost	2016/17 Total Annual Cost	Total Annual Cost Change	
TF12B (Max Rate) Winter	112495	39,826	39,826	0	5	\$10.2300	\$2,037,100	\$2,037,100	\$0
TF12B (Max Rate) Summer	112495	39,826	39,826	0	7	\$5.6830	\$1,584,318	\$1,584,318	\$0
TF12V (Max Rate)	112495	30,290	30,290	0	12	\$9.0926	\$3,304,978	\$3,304,978	\$0
TF5 (Max Rate)	112495	32,278	32,278	0	5	\$15.1530	\$2,445,543	\$2,445,543	\$0
TF12B (Discount-Winter)	112495	5,200	5,200	0	12	\$7.4951	\$467,694	\$467,694	\$0
TFX12 (Max Rate)	112486	10,822	10,822	0	12	\$9.6288	\$1,250,434	\$1,250,434	\$0
TFX Apr (Max Rate)	112486	2,000	2,000	0	1	\$5.6830	\$11,366	\$11,366	\$0
TFX Oct (Max Rate)	112486	2,000	2,000	0	1	\$5.6830	\$11,366	\$11,366	\$0
TFX5 (Max Rate)	112486	81,888	81,888	0	5	\$15.1530	\$6,204,244	\$6,204,244	\$0
TFX5 (Discount)	112486	1,800	1,800	0	5	\$10.0320	\$90,288	\$90,288	\$0
TFX12 (Discount)	111866	1,283	1,283	0	12	\$4.8640	\$74,886	\$74,886	\$0
TFX12 (Discount)	111866	8,271	8,271	0	12	\$5.4720	\$543,107	\$543,107	\$0
TFX12 (Discount)	111866	11,921	11,921	0	12	\$7.6025	\$1,087,553	\$1,087,553	\$0
TFX5 (Discount)	111866	379	379	0	5	\$4.8640	\$9,217	\$9,217	\$0
TFX5 (Discount)	111866	2,445	2,445	0	5	\$5.4720	\$66,895	\$66,895	\$0
TFX5 (Discount)	111866	22,189	22,189	0	5	\$15.1392	\$1,679,619	\$1,679,619	\$0
Windom	118657	2,500	2,500	0	12	\$0.0000	\$0	\$0	\$0
Northwestern Energy		1,035	1,035	0	12	\$8.3382	\$99,360	\$103,560	\$4,200
Total Demand Cost							\$20,967,969	\$20,972,169	\$4,200

Costs Assigned In Commodity

	2015/16 Entitlements	2016/17 Entitlement	Entitlement Change	Months	2016/17 Rate/Dth	2015/16 Total Annual Cost	Entitlement Total Cost	Entitlement Change	
<u>Upstream</u>									
<u>Surcharges:</u>									
<u>Storage (FDD)</u>									
FDD - Reservation	118657	75,437	75,437	0	12 \$	1.7140	\$1,551,588	\$1,551,588	\$0
FDD - Storage Cycle	118657	869,864	869,864	0	5 \$	0.3567	\$1,551,402	\$1,551,402	\$0
FDD - Reservation	118657	5,550	5,550	0	12 \$	3.3157	\$220,826	\$220,826	\$0
FDD - Storage Cycle	118657	64,000	64,000	0	5 \$	0.6901	\$220,832	\$220,832	\$0
FDD - Reservation	130698	2,602	12,141	9,539	12 \$	1.7140	\$53,518	\$249,716	\$196,198
FDD - Storage Cycle	130698	30,000	140,000	110,000	5 \$	0.3567	\$53,505	\$249,690	\$196,185
FDD - Reservation	130699	11,274	8,672	(2,602)	12 \$	1.7140	\$231,884	\$178,366	(\$53,518)
FDD - Storage Cycle	130699	130,000	100,000	(30,000)	5 \$	0.3567	\$231,855	\$178,350	(\$53,505)
<u>Pipeline</u>									
Bison	FT0003	50,000	50,000	0	12	\$17.4896	\$10,493,750	\$10,493,750	\$0
NBPL	T8673F	50,000	50,000	0	12	\$6.9958	\$4,197,500	\$4,197,500	\$0
SMS-Bal Service		272,160	272,160	0	1	\$2.1800	\$593,309	\$593,309	\$0
Physical Forward Start Premium							\$0	\$175,451	\$175,451
Producer Demand Payments/Option Premium							\$1,352,456	\$1,010,681	(\$341,775)
Total Commodity Costs							\$20,752,425	\$20,871,461	\$119,037

MINNESOTA ENERGY RESOURCES - NNGDaily Total Throughput Data - July 1, 2015 through June 30, 2016
NNGMinnesota Energy Resources Corporation
2016-2017 Demand Entitlement

Design Day:

Base	16,052
Variable	2,204

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Date	13.42% Cloquet Adjusted HDD	28.45% Minneapolis Adjusted HDD	44.70% Rochester Adjusted HDD	13.43% Worthington Adjusted HDD	100.00% Weighted Adjusted HDD	Actual Total Through- Put *	Estimated Firm Through- Put **
7/1/15	3	1	8	2	4	112,116	25,440
7/2/15	0	0	2	5	1	111,256	19,197
7/3/15	0	0	0	0	0	86,143	16,052
7/4/15	0	0	0	0	0	83,114	16,052
7/5/15	0	0	0	0	0	91,844	16,052
7/6/15	8	2	2	6	3	100,512	23,260
7/7/15	6	0	5	6	4	98,512	25,100
7/8/15	2	0	3	1	2	100,643	19,974
7/9/15	0	0	0	0	0	103,944	16,052
7/10/15	0	0	0	0	0	104,204	16,052
7/11/15	0	0	0	0	0	98,881	16,052
7/12/15	0	0	0	0	0	116,085	16,052
7/13/15	0	0	0	0	0	143,028	16,052
7/14/15	3	0	0	0	0	156,054	16,821
7/15/15	0	0	0	0	0	138,903	16,052
7/16/15	0	0	0	0	0	113,935	16,052
7/17/15	0	0	0	0	0	135,164	16,052
7/18/15	0	0	0	0	0	112,048	16,052
7/19/15	0	0	0	0	0	116,303	16,052
7/20/15	1	0	0	0	0	124,220	16,377
7/21/15	0	0	0	0	0	116,917	16,052
7/22/15	0	0	0	0	0	123,632	16,052
7/23/15	0	0	0	0	0	119,617	16,052
7/24/15	0	0	0	0	0	124,173	16,052
7/25/15	0	0	0	0	0	112,847	16,052
7/26/15	0	0	0	0	0	112,983	16,052
7/27/15	0	0	0	0	0	118,506	16,052
7/28/15	0	0	0	0	0	110,116	16,052
7/29/15	0	0	0	0	0	94,710	16,052
7/30/15	0	0	0	0	0	116,319	16,052
7/31/15	0	0	0	0	0	117,327	16,052
8/1/15	0	0	0	0	0	96,004	16,052
8/2/15	0	0	0	0	0	89,325	16,052
8/3/15	4	0	2	0	1	110,262	18,900
8/4/15	6	0	0	0	1	110,966	17,915
8/5/15	2	0	0	0	0	109,800	16,525
8/6/15	3	0	0	0	0	94,616	16,851
8/7/15	5	0	0	0	1	117,417	17,560
8/8/15	0	0	0	0	0	106,545	16,052
8/9/15	0	0	0	0	0	111,765	16,052
8/10/15	0	0	0	0	0	122,310	16,052
8/11/15	0	0	0	0	0	134,124	16,052
8/12/15	0	0	0	0	0	145,470	16,052
8/13/15	0	0	0	0	0	136,756	16,052
8/14/15	0	0	0	0	0	135,012	16,052
8/15/15	0	0	0	0	0	127,075	16,052
8/16/15	0	0	0	0	0	111,650	16,052
8/17/15	6	0	0	4	1	118,670	19,218
8/18/15	6	3	4	5	4	102,479	25,216
8/19/15	10	7	9	9	9	104,378	35,266
8/20/15	5	0	4	0	2	101,024	21,462
8/21/15	0	0	0	0	0	102,814	16,052
8/22/15	1	0	0	0	0	96,118	16,229
8/23/15	13	5	8	10	8	97,820	33,962
8/24/15	16	6	10	9	9	106,947	36,273
8/25/15	10	2	6	8	6	104,036	28,576
8/26/15	7	0	3	1	2	104,419	21,177
8/27/15	1	0	0	0	0	114,661	16,348
8/28/15	0	0	5	7	3	109,261	22,803
8/29/15	0	0	0	2	0	106,967	16,526
8/30/15	0	0	0	0	0	111,043	16,052
8/31/15	0	0	0	0	0	143,457	16,052
9/1/15	0	0	0	0	0	148,045	16,052
9/2/15	0	0	0	0	0	132,435	16,052
9/3/15	3	0	0	0	0	139,592	16,821

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9/4/15	0	0	0	0	0	132,825	16,052
9/5/15	0	0	0	0	0	118,542	16,052
9/6/15	0	0	0	0	0	99,083	16,052
9/7/15	0	0	0	0	0	105,455	16,052
9/8/15	3	0	2	1	1	137,825	19,344
9/9/15	6	0	1	0	1	137,096	18,999
9/10/15	14	6	7	9	8	126,887	32,739
9/11/15	17	10	16	17	14	120,082	47,952
9/12/15	8	5	11	10	9	115,281	35,578
9/13/15	2	0	3	0	2	120,448	19,461
9/14/15	0	0	0	0	0	144,811	16,052
9/15/15	0	0	0	0	0	141,960	16,052
9/16/15	0	0	0	0	0	137,120	16,052
9/17/15	5	1	0	0	1	139,367	18,339
9/18/15	12	12	10	17	12	123,494	41,693
9/19/15	9	6	10	10	9	118,317	35,232
9/20/15	3	2	5	1	3	117,850	23,630
9/21/15	0	0	0	0	0	125,709	16,052
9/22/15	9	0	0	0	1	132,072	18,566
9/23/15	14	0	0	0	2	133,093	20,104
9/24/15	9	0	0	3	2	127,053	19,454
9/25/15	10	0	0	0	1	126,982	19,039
9/26/15	7	0	0	0	1	114,721	18,211
9/27/15	0	0	0	0	0	119,702	16,052
9/28/15	14	3	1	5	4	146,013	24,615
9/29/15	21	12	16	14	15	121,461	50,178
9/30/15	15	12	16	12	14	131,837	47,400
10/1/15	22	15	19	17	18	134,790	55,103
10/2/15	22	14	18	18	17	129,971	54,193
10/3/15	24	16	19	19	18	128,673	56,769
10/4/15	18	14	18	17	17	135,294	52,527
10/5/15	14	11	13	9	12	155,309	42,562
10/6/15	19	9	10	8	11	143,606	39,983
10/7/15	20	10	10	6	11	127,383	39,593
10/8/15	21	12	8	11	11	130,895	40,195
10/9/15	19	16	18	12	17	139,813	53,809
10/10/15	10	3	7	0	5	119,539	27,829
10/11/15	0	0	0	0	0	111,462	16,052
10/12/15	22	17	18	18	18	132,996	55,885
10/13/15	21	17	20	13	18	137,756	56,175
10/14/15	14	9	11	12	11	135,343	40,508
10/15/15	26	22	23	23	23	151,675	67,517
10/16/15	33	28	34	26	31	172,799	84,040
10/17/15	28	21	24	20	23	159,792	67,092
10/18/15	21	16	17	10	17	144,332	52,527
10/19/15	11	2	1	3	3	137,220	22,811
10/20/15	22	4	4	3	6	154,341	29,808
10/21/15	26	15	20	19	19	164,876	57,673
10/22/15	18	14	14	18	15	166,472	49,354
10/23/15	22	16	13	17	15	150,550	49,974
10/24/15	24	18	24	22	22	146,960	64,174
10/25/15	22	16	21	15	19	156,993	58,365
10/26/15	23	13	13	17	15	179,281	48,752
10/27/15	20	16	17	21	18	160,258	55,016
10/28/15	27	29	31	36	31	190,620	83,357
10/29/15	24	23	26	31	26	192,216	72,294
10/30/15	24	20	23	25	23	170,474	66,029
10/31/15	22	22	25	19	23	174,944	66,173
11/1/15	23	16	16	15	17	156,564	53,046
11/2/15	14	8	13	10	12	157,700	41,450
11/3/15	16	4	6	7	7	150,375	32,039
11/4/15	13	6	8	4	8	147,908	32,614
11/5/15	17	14	14	19	15	152,724	49,534
11/6/15	30	28	28	31	29	181,416	79,760
11/7/15	29	23	28	25	26	177,480	74,250
11/8/15	18	15	23	21	20	166,266	59,061
11/9/15	17	16	23	17	19	169,221	58,261
11/10/15	16	14	18	19	17	169,736	52,944
11/11/15	20	22	23	36	24	181,798	69,501
11/12/15	34	33	35	34	34	206,359	91,151
11/13/15	35	29	35	30	33	199,048	87,858
11/14/15	26	18	21	18	20	172,166	60,922
11/15/15	23	12	14	16	15	156,246	48,490
11/16/15	19	19	21	17	20	168,895	59,382
11/17/15	17	12	13	19	14	159,747	47,017
11/18/15	29	28	32	36	31	184,234	84,119
11/19/15	49	43	44	41	44	231,308	112,836

Minnesota Energy Resources Corporation
2016-2017 Demand Entitlement
MERC-NNG
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11/20/15	49	46	46	52	47	238,941	119,540
11/21/15	51	46	53	56	51	245,112	128,859
11/22/15	46	41	47	49	46	233,589	116,664
11/23/15	34	30	33	41	33	242,763	88,925
11/24/15	35	29	31	36	32	206,643	86,120
11/25/15	32	25	26	39	28	195,628	78,491
11/26/15	53	45	42	58	46	229,229	117,971
11/27/15	49	46	50	52	49	253,264	124,122
11/28/15	44	43	41	45	42	236,027	109,420
11/29/15	39	38	38	38	38	240,138	99,759
11/30/15	37	36	37	41	37	258,066	98,377
12/1/15	33	37	42	42	39	246,649	102,572
12/2/15	36	39	41	49	41	250,458	105,688
12/3/15	41	39	41	48	41	246,584	107,100
12/4/15	36	31	32	36	33	211,240	88,899
12/5/15	29	25	28	36	29	198,260	79,064
12/6/15	36	32	32	37	33	205,994	88,603
12/7/15	34	30	32	35	32	205,416	86,171
12/8/15	32	30	30	34	31	207,238	84,147
12/9/15	30	27	29	29	28	193,255	78,746
12/10/15	31	26	29	29	28	196,715	78,827
12/11/15	31	31	28	34	30	197,027	82,452
12/12/15	31	28	28	34	29	186,635	79,809
12/13/15	35	31	29	38	32	193,177	86,158
12/14/15	41	35	36	38	37	222,827	96,686
12/15/15	41	34	33	34	34	218,362	92,026
12/16/15	42	38	43	47	42	233,671	108,688
12/17/15	52	49	52	53	51	262,148	128,846
12/18/15	65	56	57	58	58	286,438	143,274
12/19/15	56	49	49	48	50	250,787	125,888
12/20/15	42	32	31	39	34	221,388	90,974
12/21/15	44	35	36	43	38	239,189	99,543
12/22/15	38	36	39	39	38	237,710	99,490
12/23/15	43	40	42	42	42	237,621	107,593
12/24/15	49	41	42	45	43	239,543	111,498
12/25/15	43	40	44	43	42	233,761	109,593
12/26/15	51	45	44	60	47	242,771	120,019
12/27/15	61	52	52	68	55	274,072	137,338
12/28/15	50	49	53	62	53	272,304	131,920
12/29/15	53	44	45	50	46	265,048	118,401
12/30/15	49	53	55	60	54	278,000	135,206
12/31/15	52	56	59	63	57	266,295	142,337
1/1/16	49	47	54	53	51	253,716	128,441
1/2/16	46	46	52	51	49	244,735	124,817
1/3/16	44	49	52	57	51	259,625	127,866
1/4/16	48	52	57	63	55	293,984	137,609
1/5/16	42	42	50	50	47	258,369	119,026
1/6/16	40	38	43	38	40	263,144	104,862
1/7/16	36	34	36	38	36	251,493	94,847
1/8/16	51	51	52	63	53	253,834	132,773
1/9/16	78	76	81	83	79	328,255	190,636
1/10/16	79	74	84	75	79	370,281	190,988
1/11/16	79	72	74	70	74	367,073	178,102
1/12/16	75	72	74	70	73	371,941	177,049
1/13/16	61	55	54	50	55	311,819	136,931
1/14/16	53	47	46	52	48	273,766	122,179
1/15/16	71	63	64	70	65	301,410	159,800
1/16/16	87	81	85	81	84	359,330	200,778
1/17/16	85	80	88	79	84	354,698	202,045
1/18/16	79	72	81	69	76	372,040	184,577
1/19/16	67	64	71	62	67	331,243	164,060
1/20/16	55	49	55	49	52	276,157	131,550
1/21/16	53	47	48	52	49	275,349	123,662
1/22/16	53	47	50	57	50	281,048	127,035
1/23/16	51	47	50	52	50	247,209	125,224
1/24/16	41	39	42	45	41	222,607	107,363
1/25/16	44	42	46	50	45	237,261	115,301
1/26/16	49	48	56	49	52	251,300	130,199
1/27/16	44	40	47	44	44	225,768	112,900
1/28/16	56	42	49	43	47	239,312	119,651
1/29/16	46	40	45	39	43	224,950	110,475
1/30/16	38	29	35	32	33	191,295	88,851
1/31/16	37	35	40	38	38	209,605	99,114
2/1/16	42	37	42	39	40	238,321	104,656
2/2/16	51	49	49	57	50	243,108	126,258
2/3/16	60	54	62	56	58	281,429	144,862
2/4/16	57	51	55	55	54	282,751	135,481

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2/5/16	52	51	55	48	53	253,812	131,778
2/6/16	40	37	44	45	41	226,987	107,384
2/7/16	49	47	50	50	49	244,045	123,885
2/8/16	69	64	69	69	68	302,175	163,224
2/9/16	73	62	69	62	66	325,709	162,401
2/10/16	69	59	66	60	64	347,331	156,568
2/11/16	66	58	64	60	62	310,099	152,759
2/12/16	80	71	76	72	74	329,587	180,212
2/13/16	69	65	69	69	68	305,595	166,176
2/14/16	59	54	56	51	55	274,711	137,861
2/15/16	45	41	43	39	42	243,334	108,751
2/16/16	62	43	50	45	49	255,833	123,867
2/17/16	54	45	51	43	49	249,704	123,257
2/18/16	38	35	38	37	37	229,752	97,696
2/19/16	31	29	34	31	31	216,650	85,443
2/20/16	36	34	36	33	35	219,627	93,041
2/21/16	43	36	34	36	36	228,315	95,232
2/22/16	42	34	35	37	36	238,340	95,262
2/23/16	36	32	35	38	35	230,513	92,166
2/24/16	43	37	40	41	39	235,825	102,946
2/25/16	49	39	42	44	43	246,493	109,875
2/26/16	40	34	38	34	37	216,973	97,025
2/27/16	28	20	23	22	23	182,329	66,055
2/28/16	53	38	36	40	40	228,066	103,342
2/29/16	62	51	47	54	51	278,419	128,986
3/1/16	58	48	60	62	57	307,329	140,982
3/2/16	45	45	52	49	49	268,728	123,538
3/3/16	49	36	40	44	40	264,523	105,014
3/4/16	43	35	39	36	38	231,098	99,664
3/5/16	40	34	37	37	36	213,132	96,237
3/6/16	26	16	28	14	22	176,094	65,225
3/7/16	32	9	12	11	14	160,398	46,265
3/8/16	23	14	15	23	17	172,244	52,816
3/9/16	32	29	31	30	30	235,889	82,734
3/10/16	32	28	31	27	30	219,043	81,153
3/11/16	21	14	17	12	16	161,998	50,862
3/12/16	16	8	11	12	11	142,617	39,811
3/13/16	25	15	18	17	18	160,181	55,989
3/14/16	22	13	14	15	15	149,505	49,061
3/15/16	30	20	23	24	23	170,946	66,986
3/16/16	36	28	31	29	31	191,603	83,335
3/17/16	37	32	34	37	34	216,706	91,795
3/18/16	47	36	35	37	37	234,543	97,508
3/19/16	42	31	37	40	36	211,159	96,042
3/20/16	37	32	36	35	35	232,936	92,388
3/21/16	34	25	29	21	27	202,691	76,117
3/22/16	39	25	20	27	25	184,380	70,777
3/23/16	44	38	42	48	42	223,056	108,699
3/24/16	38	30	43	40	38	224,771	100,155
3/25/16	30	27	37	31	32	192,601	87,567
3/26/16	36	24	25	37	28	199,811	77,441
3/27/16	33	31	32	32	32	214,362	86,133
3/28/16	30	18	21	19	21	195,437	62,361
3/29/16	19	14	16	18	16	157,263	51,248
3/30/16	28	23	22	23	23	188,352	67,136
3/31/16	33	23	27	30	27	199,709	75,746
4/1/16	43	36	37	41	38	204,370	100,119
4/2/16	46	39	39	34	39	220,723	102,664
4/3/16	43	20	18	19	22	191,047	64,630
4/4/16	37	32	36	31	34	241,094	91,675
4/5/16	34	34	35	22	33	218,392	88,109
4/6/16	33	30	31	29	30	216,169	83,176
4/7/16	40	33	34	33	34	221,599	91,563
4/8/16	52	42	45	45	45	244,695	115,245
4/9/16	42	35	39	33	37	203,295	98,326
4/10/16	31	23	27	26	26	194,869	74,373
4/11/16	42	34	38	37	37	245,104	97,258
4/12/16	30	27	26	19	26	205,564	73,057
4/13/16	26	6	10	5	10	163,821	38,466
4/14/16	9	3	8	4	6	138,468	29,606
4/15/16	6	0	2	1	2	128,035	20,389
4/16/16	6	0	0	0	1	109,688	17,768
4/17/16	10	0	1	0	2	120,648	19,660
4/18/16	29	2	1	9	6	156,467	28,553
4/19/16	26	11	14	11	14	168,123	47,398
4/20/16	14	6	14	13	12	148,956	41,602
4/21/16	16	12	12	12	12	152,144	43,529

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4/22/16	27	14	17	12	17	148,835	53,279
4/23/16	23	5	5	1	7	121,074	31,066
4/24/16	34	12	2	3	9	134,631	36,635
4/25/16	35	18	8	14	15	171,710	49,858
4/26/16	28	23	23	26	24	168,835	69,466
4/27/16	27	23	26	31	26	180,383	73,521
4/28/16	29	29	29	29	29	215,794	79,475
4/29/16	23	15	22	24	21	170,725	61,555
4/30/16	28	18	24	29	24	154,029	67,874
5/1/16	25	14	19	20	18	163,864	56,588
5/2/16	12	8	12	14	11	167,262	40,734
5/3/16	13	7	12	12	10	138,313	39,056
5/4/16	18	10	15	12	13	138,700	45,368
5/5/16	2	0	5	0	2	148,942	21,481
5/6/16	0	0	0	0	0	133,857	16,052
5/7/16	16	7	12	10	11	146,164	39,940
5/8/16	14	1	5	3	5	131,905	26,687
5/9/16	17	8	13	9	11	150,710	41,332
5/10/16	23	13	14	6	14	178,384	47,112
5/11/16	18	14	13	12	14	181,854	46,306
5/12/16	16	17	19	18	18	190,601	55,909
5/13/16	32	28	29	31	29	180,870	80,291
5/14/16	33	24	29	22	27	175,351	75,821
5/15/16	16	10	13	12	13	158,100	44,059
5/16/16	21	10	12	10	12	157,348	43,161
5/17/16	16	11	16	12	14	147,500	47,375
5/18/16	14	6	10	8	9	141,190	36,271
5/19/16	8	1	3	6	4	128,848	23,958
5/20/16	9	0	5	9	5	131,361	26,057
5/21/16	3	0	1	1	1	122,858	17,639
5/22/16	0	0	0	0	0	120,964	16,052
5/23/16	0	0	0	0	0	132,655	16,052
5/24/16	2	0	0	0	0	128,343	16,525
5/25/16	18	0	0	0	2	129,091	21,435
5/26/16	7	0	0	0	1	133,999	18,034
5/27/16	11	1	0	0	2	129,936	19,619
5/28/16	8	1	0	2	1	123,945	19,265
5/29/16	3	0	0	0	0	121,496	17,028
5/30/16	3	0	0	0	0	127,416	16,851
5/31/16	22	0	0	3	3	136,366	23,447
6/1/16	11	4	6	10	7	132,716	30,553
6/2/16	9	0	0	0	1	135,135	18,832
6/3/16	15	2	0	3	3	130,543	22,321
6/4/16	12	1	2	5	4	121,493	23,879
6/5/16	3	0	0	0	0	120,114	16,851
6/6/16	11	6	7	8	7	129,728	31,750
6/7/16	14	3	7	1	6	130,080	28,684
6/8/16	5	0	0	0	1	125,553	17,590
6/9/16	9	0	0	0	1	138,762	18,625
6/10/16	0	0	0	0	0	145,617	16,052
6/11/16	0	0	0	0	0	134,333	16,052
6/12/16	12	0	0	0	2	123,876	19,453
6/13/16	11	0	0	0	1	142,999	19,276
6/14/16	14	0	0	0	2	144,762	20,134
6/15/16	12	0	0	0	2	155,477	19,542
6/16/16	3	0	0	0	0	148,157	16,821
6/17/16	0	0	0	0	0	151,309	16,052
6/18/16	0	0	0	0	0	150,349	16,052
6/19/16	0	0	0	0	0	126,669	16,052
6/20/16	2	0	0	0	0	159,110	16,555
6/21/16	1	0	0	0	0	149,422	16,200
6/22/16	6	0	0	0	1	150,104	17,679
6/23/16	0	0	6	0	3	155,330	21,865
6/24/16	0	0	0	0	0	143,926	16,052
6/25/16	0	0	0	0	0	138,507	16,052
6/26/16	0	0	0	0	0	146,479	16,052
6/27/16	11	0	0	0	1	144,824	19,187
6/28/16	3	0	4	0	2	160,375	21,107
6/29/16	0	0	0	0	0	155,099	16,052
6/30/16	7	0	0	3	1	147,141	18,833
Totals	8,872	7,038	7,761	7,811	7,711	65,125,236	22,870,602

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* Volumes include interruptible and transportation volumes

** Design Model numbers are used to calculate firm volumes only

MINNESOTA ENERGY RESOURCES - NNG

Customer Counts by PGAC Class - July 1, 2015 through June 30, 2016

Tariff Rate Class	Rate Designation	Jul-15 Average Customers	Aug-15 Average Customers	Sep-15 Average Customers	Oct-15 Average Customers	Nov-15 Average Customers	Dec-15 Average Customers	Jan-16 Average Customers	Feb-16 Average Customers	Mar-16 Average Customers	Apr-16 Average Customers	May-16 Average Customers	Jun-16 Average Customers	Annual Average Customers
GS- Residential	MERC000001	169,036	164,816	165,258	176,318	149,508	166,955	173,435	176,720	168,129	168,859	169,135	169,628	168,150
GS-C&I <1,500 therms/yr (Small)	MERC000005	6,522	6,342	6,346	7,030	5,525	6,428	6,782	6,837	6,690	6,690	6,536	6,534	6,522
GS-C&I <1,500 therms/yr (Small) Emmons, IA	MERC000013	1	1	1	1	1	1	1	1	1	1	1	1	1
GS-C&I >1,500 therms/yr (Large)	MERC000009	9,979	9,686	9,670	10,604	8,551	9,789	10,340	10,293	9,943	9,943	10,003	9,965	9,897
GS-C&I >1,500 therms/yr (Large) Emmons, IA	MERC000014	3	3	3	3	3	3	3	3	3	3	3	3	3
Small Volume Interruptible (SVI)	MERC000015	296	298	299	295	297	301	301	272	272	93	576	241	295
Small Volume Interruptible w/Joint (SVJ)	MERC000019	3	3	3	3	3	0	6	7	7	5	6	5	4
Large Volume Interruptible (LVI)	MERC000022	61	65	62	63	61	59	58	54	54	58	100	58	63
Large Volume Interruptible w/Joint (LVJ)	MERC000026	0	0	0	0	0	0	0	0	0	0	1	2	0
Super Large Volume Interruptible (SLVI)	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0
Super Large Volume Interruptible w/Joint (SLVJ)	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		185,901	181,214	181,642	194,317	163,949	183,536	190,926	194,187	185,099	185,652	186,361	186,437	184,935

MINNESOTA ENERGY RESOURCES - NNG

Projected Fixed Cost - November 2010 through March 2017

Futures Contracts WACOG

Minnesota Energy Resources Corporation
2016-2017 Demand Entitlement
MERC-NNG

Table with columns for Deal Number, Purchase Date, Trade, Number Contracts, Physical Volume, Strike Price, Strike Cost, LDS Settle*, LDS Settle Cost, Over/(Under) Market, Premium Per Unit, Premium Cost, Total Cost. It is organized into sections for Nov-16, Dec-16, Jan-17, and Feb-17, each containing a list of deals and a summary row.

*Prices from 10/24/16 NYMEX market

MINNESOTA ENERGY RESOURCES - NNG

Projected Storage Cost - November 2016 through March 2017

Minnesota Energy Resources Corporation
2016-2017 Demand Entitlement
MERC-NNG

Month/Year	K#118657 NNG Storage	LS Power K#130698 NNG Storage	LS Power K#130699 NNG Storage	Total NNG Storage	Projected NNG WACOG	K#118657 NNG Storage Cost	K#130698 NNG Storage Cost	K#130699 NNG Storage Cost	Total NNG Storage Cost	AECO Storage GLGT/VGT Centra Emerson	AECO Storage GLGT/VGT Centra Emerson WACOG	AECO Storage GLGT/VGT Centra Emerson Cost	NNG-ABL K#22335 NNG Storage	NNG-ABL K#22335 NNG Projected WACOG	NNG-ABL K#22335 NNG Projected Cost
Nov-16	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 1,017,396	\$ 152,523	\$ 108,945	\$ 1,278,863	85,304	\$ 1,4605	\$ 124,586	34,125	\$ 2,6571	\$ 90,674
Dec-16	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,556,532	\$ 383,262	\$ 273,758	\$ 3,213,552	231,768	\$ 1,4605	\$ 338,496	85,750	\$ 2,6571	\$ 227,848
Jan-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,556,532	\$ 383,262	\$ 273,758	\$ 3,213,552	231,768	\$ 1,4605	\$ 338,496	85,750	\$ 2,6571	\$ 227,848
Feb-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,556,532	\$ 383,262	\$ 273,758	\$ 3,213,552	209,339	\$ 1,4605	\$ 305,739	85,750	\$ 2,6571	\$ 227,848
Mar-17	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 1,017,396	\$ 152,523	\$ 108,945	\$ 1,278,863	96,374	\$ 1,4605	\$ 140,754	34,125	\$ 2,6571	\$ 90,674
Total	4,342,470	651,000	465,000	5,458,470	\$ 2,2348	\$ 9,704,387	\$ 1,454,830	\$ 1,039,164	\$ 12,198,381	854,552	\$ 1,4605	\$ 1,248,070	325,500	\$ 2,6571	\$ 864,894

Month/Year	NNG Storage Volume	NNG Indexes Price	NNG Indexes Cost
Nov-16	572,259	\$ 2,8410	\$ 1,625,788
Dec-16	1,437,984	\$ 3,4365	\$ 4,941,632
Jan-17	1,437,984	\$ 3,8650	\$ 5,557,808
Feb-17	1,437,984	\$ 3,9095	\$ 5,621,798
Mar-17	572,259	\$ 3,4900	\$ 1,997,184
Total	5,458,470	\$ 3,6172	\$ 19,744,210
			\$ 7,545,829

Month/Year	AECO Storage Volume	Total AECO Market WACOG	Total AECO Market Cost
Nov-16	85,304	\$ 2,2935	\$ 195,644
Dec-16	231,768	\$ 2,3790	\$ 551,376
Jan-17	231,768	\$ 2,4475	\$ 567,252
Feb-17	209,339	\$ 2,4595	\$ 514,868
Mar-17	96,374	\$ 2,4200	\$ 233,225
Total	854,552	\$ 2,4134	\$ 2,062,364
			\$ 814,294

Month/Year	NNG-ABL Storage Volume	NNG-ABL Indexes Price	NNG-ABL Indexes Cost
Nov-16	34,125	\$ 2,8410	\$ 96,949
Dec-16	85,750	\$ 3,4365	\$ 294,680
Jan-17	85,750	\$ 3,8650	\$ 331,424
Feb-17	85,750	\$ 3,9095	\$ 335,240
Mar-17	34,125	\$ 3,4900	\$ 119,096
Total	325,500	\$ 3,6172	\$ 1,177,389
			\$ 312,495

Max NNG-MERC Storage (Storage plan withdrawals through Apr 17)	5,458,470	5,869,321	09/30/16 Storage Balance - NNG-MERC	4,579,317	78.02%	4,258,766
Max AECO Storage (Storage plan withdrawals through Apr 17)	854,552	947,817	09/30/16 Storage Balance - AECO	797,474	84.14%	719,003
Max NNG-ABL Storage (Storage plan withdrawals through Apr 17)	325,500	350,000	09/30/16 Storage Balance - NNG-ABL	275,072	78.59%	255,817

Month/Year	K#118657 NNG Storage	LS Power K#130698 NNG Storage	LS Power K#130699 NNG Storage	Total NNG Storage	Projected K#118657 NNG WACOG	Projected K#130698 NNG WACOG	Projected K#130699 NNG WACOG	WACOG NNG Cost	Projected NNG Indexes Price	Projected NNG Index Cost	Additional Storage (Savings)/ Cost
Nov-16	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 1,278,863	\$ 2,8410	\$ 1,625,788	\$ (346,925)
Dec-16	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 3,213,552	\$ 3,4365	\$ 4,941,632	\$ (1,728,080)
Jan-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 3,213,552	\$ 3,8650	\$ 5,557,808	\$ (2,344,256)
Feb-17	1,143,984	171,500	122,500	1,437,984	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 3,213,552	\$ 3,9095	\$ 5,621,798	\$ (2,408,246)
Mar-17	455,259	68,250	48,750	572,259	\$ 2,2348	\$ 2,2348	\$ 2,2348	\$ 1,278,863	\$ 3,4900	\$ 1,997,184	\$ (718,321)
Total	4,342,470	651,000	465,000	5,458,470	\$ 2,8092	\$ 2,8092	\$ 2,8092	\$ 12,198,381	\$ 3,1285	\$ 19,744,210	\$ (7,545,829)

Month/Year	AECO Storage	AECO Storage Other WACOG	Total AECO Cost	Projected AECO Index Price	Projected AECO Index Cost	Additional Storage (Savings)/ Cost
Nov-16	85,304	\$ 1,4605	\$ 124,586	\$ 2,2935	\$ 195,644	\$ (71,058)
Dec-16	231,768	\$ 1,4605	\$ 338,496	\$ 2,3790	\$ 551,376	\$ (212,879)
Jan-17	231,768	\$ 1,4605	\$ 338,496	\$ 2,4475	\$ 567,252	\$ (228,755)
Feb-17	209,339	\$ 1,4605	\$ 305,739	\$ 2,4595	\$ 514,868	\$ (209,130)
Mar-17	96,374	\$ 1,4605	\$ 140,754	\$ 2,4200	\$ 233,225	\$ (92,471)
Total	854,552	\$ 1,4605	\$ 1,248,070	\$ 2,4134	\$ 2,062,364	\$ (814,294)

Month/Year	NNG-ABL K#22335 NNG Storage	K#22335 NNG Projected WACOG	K#22335 NNG Projected Cost	NNG-ABL Indexes Price	NNG-ABL Indexes Cost	Additional Storage (Savings)/ Cost
Nov-16	34,125	\$ 2,6571	\$ 90,674	\$ 2,8410	\$ 96,949	\$ (6,275)
Dec-16	85,750	\$ 2,6571	\$ 227,848	\$ 3,4365	\$ 294,680	\$ (66,831)
Jan-17	85,750	\$ 2,6571	\$ 227,848	\$ 3,8650	\$ 331,424	\$ (103,575)
Feb-17	85,750	\$ 2,6571	\$ 227,848	\$ 3,9095	\$ 335,240	\$ (107,391)
Mar-17	34,125	\$ 2,6571	\$ 90,674	\$ 3,4900	\$ 119,096	\$ (28,422)
Total	325,500	\$ 2,6571	\$ 864,894	\$ 3,6172	\$ 1,177,389	\$ (312,495)

*Indexes and projected WACOG based on 10/24/16 market prices

MINNESOTA ENERGY RESOURCES - NNG
Projected Call Option Costs - November 2016 through March 2017

Call/Put Options WACOG

Contract = 10,000

Minnesota Energy Resources Corporation

2016-2017 Demand Entitlement

MERC-NNG

Nov-16														Dec-16														Jan-17																															
Deal Number	Purchase Date	Trade Number	Number Contracts	Physical Volume	Strike Price	Strike Cost	Option Price	Option Cost	Pent Settle*	Pent Settle Cost	Over/(Under) Market	Premium Per Unit	Premium Cost	Total Cost	Deal Number	Purchase Date	Trade Number	Number Contracts	Physical Volume	Strike Price	Strike Cost	Option Price	Option Cost	Pent Settle*	Pent Settle Cost	Over/(Under) Market	Premium Per Unit	Premium Cost	Total Cost	Deal Number	Purchase Date	Trade Number	Number Contracts	Physical Volume	Strike Price	Strike Cost	Option Price	Option Cost	Pent Settle*	Pent Settle Cost	Over/(Under) Market	Premium Per Unit	Premium Cost	Total Cost															
1	05/24/16	36873	12	120,000	\$ 2,7500	\$ 330,000	\$ 2,7500	\$ 330,000	\$ 2,8310	\$ 339,720	\$ (9,720)	\$ 0.1840	\$ 22,080	\$ 352,080	1	05/20/16	36765	17	170,000	\$ 3,0000	\$ 510,000	\$ 3,0000	\$ 510,000	\$ 3,3190	\$ 564,230	\$ (54,230)	\$ 0.2420	\$ 41,140	\$ 551,140	1	05/19/16	36702	20	200,000	\$ 3,2500	\$ 650,000	\$ 3,2500	\$ 650,000	\$ 3,4650	\$ 693,000	\$ (43,000)	\$ 0.2580	\$ 51,600	\$ 701,600	1	05/19/16	36702	20	200,000	\$ 3,2500	\$ 650,000	\$ 3,2500	\$ 650,000	\$ 3,4650	\$ 693,000	\$ (43,000)	\$ 0.2580	\$ 51,600	\$ 701,600
Total																																																											
Total				65	650,000	\$ 1,920,000	\$ 2,9538	\$ 1,920,000	\$ 2,8160	\$ 1,830,430	\$ (8,570)	\$ 0.1624	\$ 105,560	\$ 1,935,990	Total				94	940,000	\$ 3,047,500	\$ 3,2151	\$ 3,022,160	\$ 3,119,860	\$ (97,700)	\$ 0.2246	\$ 211,160	\$ 3,233,320	Total				113	1,130,000	\$ 3,860,000	\$ 3,9277	\$ 3,833,750	\$ (26,250)	\$ 0.2866	\$ 323,810	\$ 4,157,560																		
Total				65	650,000	\$ 1,920,000	\$ 2,9538	\$ 1,920,000	\$ 2,8160	\$ 1,830,430	\$ (8,570)	\$ 0.1624	\$ 105,560	\$ 1,935,990	Total				94	940,000	\$ 3,047,500	\$ 3,2151	\$ 3,022,160	\$ 3,119,860	\$ (97,700)	\$ 0.2246	\$ 211,160	\$ 3,233,320	Total				113	1,130,000	\$ 3,860,000	\$ 3,9277	\$ 3,833,750	\$ (26,250)	\$ 0.2866	\$ 323,810	\$ 4,157,560																		

*Prices from 10/24/16 NYMEX market

	NNG	NNG AL	AECO
Sept 2016 WACOG	\$ 2.1612	\$ 2.6046	\$ 1.3975
Sept 2016 Volume	4,579,317	275,072	797,474

Injections			
Oct	539,208	69,671	96,334

	NNG Ventura	NNG Demarc	AECO
Index			
Oct	\$ 2.8595	\$ 2.8645	\$ 1.9820

Ending WACOG	\$ 2.23	\$ 2.66	\$ 1.46
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