

Minnesota Energy Resources Corporation

Suite 200 1995 Rahncliff Court Eagan, MN 55122

www.minnesotaenergyresources.com

November 1, 2017

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 Minnesota Energy Resources Corporation's Petition for Approval of a Change in Demand Entitlement for its NNG System – November 1 Update

Docket No. G011/M-17-588

Dear Mr. Wolf:

On August 1, 2017, Minnesota Energy Resources Corporation ("MERC" or the "Company") filed its Petition for Change in Demand Entitlement for the MERC-NNG purchased gas adjustment ("PGA") area. MERC submits this update to its August 1, 2017 Demand Entitlement filing. Additionally, MERC provides information as requested by the Department of Commerce, Division of Energy Resources (the "Department") in its October 23, 2017 Comments in Docket No. G011/GR-17-564.

In its April 28, 2016 Order in Docket Nos. G011/M-15-722, G011/M-15-723, and G011/M-15-724, 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. In accordance with the Commission's Order, MERC provides redlined changes in the attached Petition and has highlighted the affected schedules.

As of the date of this filing, MERC has completed its purchases of future contracts and call options for the 2017-2018 winter period. These final financial hedge volumes and costs are shown in Attachments 5 and 11 (pages 1 and 3). The call option premium costs additionally flow through the spreadsheet in Attachment 4, pages 1 and 2 and in Attachment 8.

In its October 23, 2017, Comments submitted in Docket No. G011/GR-17-564 on MERC's petition for approval of a base cost of gas to coincide with the implementation of interim rates, the Department requested that MERC provide, in its November 1, 2017 update in this docket, a reconciliation and explanation of changes proposed in Docket No. G011/M-17-588 (MERC-NNG's 2017-2018 Demand Entitlement) to the information included in MERC's October 1, 2017 Purchased Gas Adjustment ("PGA") filing in Docket No. G011/AA-17-703.

Mr. Daniel P. Wolf November 1, 2017 Page 2

> MERC responds that with respect to the requested reconciliation between the October 1 PGA and November 1 Demand Entitlement, the this docket are proposed effective November 1, 2017. Therefore, the changes would not be reflected in the October PGA. Additionally, however, MERC's August 1, 2017 Demand Entitlement filing schedules comparing the 2016-2017 demand costs to the proposed 2017-2018 demand costs only included the NNG costs for 2016-2017; whereas both the MERC-NNG and MERC-Albert Lea (now the consolidated MERC-NNG PGA) costs were included in the 2017-2018 demand costs. The following updated comparison includes the total demand costs for the consolidated NNG PGA between 2016-2017 and 2017-2018.

> The former MERC-Albert Lea PGA was combined into the MERC-NNG PGA effective July 1, 2017. In order to provide an accurate comparison between the 2016 and 2017 Demand Entitlement filings, Attachment 8.1 was added to this filing to reconcile the differences between the combined PGA. This reconciliation is shown in the table below.

			Net Annual
2016/17	2016/17	2017/18	Cost
Total Annual		Total Annual	
Cost	Albert Lea Cost	Cost	Change
\$2,037,100	\$161,481	\$2,517,552	\$318,971
\$1,584,318	\$373,663	\$1,957,981	\$0
\$3,304,978	\$432,342	\$3,304,978	(\$432,342)
\$2,445,543	\$302,833	\$2,748,375	\$0
\$467,694		\$467,694	\$0
\$1,250,434		\$1,250,434	\$0
\$11,366		\$11,366	\$0
\$11,366		\$11,366	\$0
\$6,204,244	\$60,612	\$6,264,856	\$0
\$90,288		\$90,288	\$0
\$74,886		\$74,886	\$0
\$543,107		\$543,107	\$0
\$1,087,553		\$1,087,553	\$0
\$9,217		\$9,217	\$0
\$66,895		\$66,895	\$0
\$1,679,619		\$1,679,619	\$0
\$0		\$0	\$0
\$103,560		\$103,560	\$0
\$20,972,169	\$1,330,930	\$22,189,728	(\$113,370)

In review of this update, MERC also discovered an error in the storage cost calculation in the 2016-2017 Demand Entitlement. This error has been corrected in Attachment 8 and the new Attachment 8.1 to accurately reflect the change from 2016-2017 to 2017-2018.

Mr. Daniel P. Wolf November 1, 2017 Page 3

Finally, in its April 28, 2016 Order in Docket Nos. G011/M-15-722, G011/M-15-723, and G011/M-15-724, the Commission directed MERC to work with the Department to develop an appropriate Design Day regression analysis methodology for its subsequent demand entitlement petitions until MERC has three years of daily interruptible data available for all interruptible for the consolidated (MERC-NNG and MERC-Albert Lea), NNG PGA area. MERC has worked with the Department to ensure its design day regression analysis for the NNG-PGA is reasonable. In particular, MERC has utilized daily telemetry data in its regression analysis for all of the MERC-NNG customers with adequate data available. MERC has completed installation of telemetry for its former MERC-Albert Lea customers and anticipates having sufficient data for these customers in approximately two years to utilize in MERC's Design Day analysis. Until that time, MERC intends to utilize the same methodology it had utilized prior to having telemetry equipment for its other interruptible customers.

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 August November 1, 2017

- To: Service List
- RE: Minnesota Energy Resources Corporation-NNG Petition for Approval of Change in Demand Entitlement

Notice of Availability

Please take notice that Minnesota Energy Resources Corporation has filed a petition with the Minnesota Public Utilities Commission for approval of a change in demand entitlement for its NNG Purchased Gas Adjustment system.

To obtain copies, or if you have any questions, please contact:

Amber Lee Minnesota Energy Resources Corporation 1995 Rahncliff Court, Suite 200 Eagan, MN 55122 (651) 322-8965

Please note that this filing is also available through the eDockets system maintained by the Minnesota Department of Commerce and the Minnesota Public Utilities Commission. You can access this document by going to eDockets through the websites of the Department of Commerce or the Public Utilities Commission or going to the eDockets homepage at:

https://www.edockets.state.mn.us/EFiling/home.jsp

Once on the eDockets homepage, this document can be accessed through the Search Documents link and by entering the date of the filing the docket number 17-588.

ATTACHMENT B

STATE OF MINNESOTA BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange Dan Lipschultz Matt Schuerger Katie Sieben John Tuma Chair 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-17-588____

SUMMARY OF FILING

Pursuant to Minnesota Rule 7825.2910, subpart 2 (Filing Upon Change in Demand),

Minnesota Energy Resources Corporation - NNG (MERC or the Company), hereby petitions

the Minnesota Public Utilities Commission (Commission) for approval of changes in demand

entitlements for MERC customers served off of the Northern Natural Gas (NNG) system.

MERC requests the Commission approve the requested changes to be recovered in the

Purchased Gas Adjustment (PGA) beginning November 1, 2017.

STATE OF MINNESOTA BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange Dan Lipschultz Matt Schuerger Katie Sieben John Tuma

Chair 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-17-588____

FILING UPON CHANGE IN DEMAND

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.¹ MERC requests the Commission approve the requested

changes to be recovered in the Purchased Gas Adjustment (PGA) beginning November 1, 2017.

This filing includes the following attachments:

Attachment A:	Notice of Availability.
Attachment B:	One paragraph summary of the filing in accordance with Minn. R. 7829.1300, subp. 1.
Attachment C:	Petition for Change in Demand with Attachments.
Attachment D:	Certificate of Service and Service List.

The following information is provided in accordance with Minn. R. 7829.1300:

¹ MERC also serves certain of its Minnesota customers off of the Viking, Great Lakes and Centra pipeline systems. MERC requests approval of a demand entitlement change for the 2017-2018 heating season for its MERC-CONSOLIDATED PGA in a separate docket.

I. Summary of Filing

Pursuant to Minn. R. 7829.1300, subp. 1, a one-paragraph summary of the filing is attached.

II. Service

Pursuant to Minn. R. 7829.1300, subp. 2, MERC has served a copy of this filing on the

Department of Commerce, Division of Energy Resources and the Office of the Attorney

General — Residential Utilities and Antitrust Division. The summary of filing has been served

on all parties on the attached service list. Additionally, pursuant to Minn. R. 7825.2910, subp. 3,

a Notice of Availability has been sent to all intervenors in the Company's previous two rate

cases.

III. General Filing Information

A. Name, Address, and Telephone Number of the Utility

Minnesota Energy Resources Corporation 1995 Rahncliff Court, Suite 200 Eagan, MN 55122 (651) 322-8901

B. Name, Address, Electronic Address, and Telephone Number of Attorney for the Utility

Kristin M. Stastny Briggs and Morgan, P.A. 2200 IDS Center 80 South 8th Street Minneapolis, MN 55402 <u>KStastny@briggs.com</u> (612) 977-8656

C. Date of the Filing and Proposed Effective Date

Date of filing: <u>August November</u> 1, 2017 Proposed Effective Date: November 1, 2017

D. Statute Controlling Schedule for Processing the Filing

Minnesota Statutes and related rules do not provide an explicit time frame for action

by the Commission. Under Minn. R. 7829.1400, initial comments are due within 30 days of

filing, with reply comments due 10 days thereafter.

E. Signature, Electronic Address, and Title of Utility Employee Responsible for the Filing

Amber S. Lee Regulatory and Legislative Affairs Manager ASLee@minnesotaenergyresources.com 1995 Rahncliff Court, Suite 200 Eagan, MN 55122 (651) 322-8965

If additional information is required, please contact Amber S. Lee at (651) 322-8965.

DATED: August <u>November</u> 1, 2017

Respectfully submitted, MINNESOTA ENERGY RESOURCES CORPORATION

By: <u>/s/ Amber S. Lee</u> Amber S. Lee 1995 Rahncliff Court, Suite 200 Eagan, MN 55122 Telephone: (651) 322-8965

ATTACHMENT C

STATE OF MINNESOTA BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange Dan Lipschultz Matt Schuerger Katie Sieben John Tuma Chair 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-17-588

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 the Commission approve the requested

changes to be recovered in the Purchased Gas Adjustment (PGA) beginning November 1, 2017.

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 8.1: Change in Entitlement Levels and Related Demand Costs (Including MERC-NNG and MERC-Albert Lea)²

Attachment 9: Actual Throughput and Design Day Forecast Estimated Throughput

Attachment 10: Customer Counts

Attachment 11: Hedging Summary

Attachment 12: Forecast Methodology

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 18,029 dekatherms (dth) from the November 1, 2016, filing. The larger than usual increase in Design-Day requirement is attributable to combining the MERC-Albert Lea PGA into the MERC-NNG PGA and new town growth load. The addition of MERC-Albert Lea alone accounts for 14,819 dth of the increase over the last heating season.

	MERC Proposed N or the 2017-2018 H	NG Reserve Margins eating Season	
	Reserve Margin 2017-2018	Reserve Margin 2016-2017	
	Heating Season	Heating Season	Change
NNG Zone EF	-0.19%	1.34%	-1.53%

² MERC also identified an error in the storage cost calculation in its 2016-2017 Demand Entitlement. This error has been corrected in Attachment 8 and Attachment 8.1 to accurately reflect the 2016-2017 storage costs. There is no impact as a result of this correction to the proposed 2017-2018 storage costs.

For the Demand Entitlement filing effective November 1, 2017, the total Design-Day requirement for MERC NNG is 266,825 dth (Attachment 1). The difference between the total Design-Day requirement and total Design-Day capacity results in a 0.19% negative reserve margin (Attachment 3). 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, 2017

See Attachment 12. <u>Additionally, MERC notes that in accordance with the</u> <u>Commission's April 28, 2016 Order in Docket Nos. G011/M-15-722, G011/M-15-723, and</u> <u>G011/M-15-724, MERC has worked with the Department in developing an appropriate Design</u> <u>Day regression analysis methodology for this filing until MERC has three years of daily</u> <u>interruptible data for all of its interruptible customers for the consolidated NNG PGA area (i.e.,</u> <u>until MERC has adequate data for the historic MERC-Albert Lea PGA).</u>

III. Additional Filing Requirements

A. Daily Design-Day Estimate to Actual Comparison

In the 2007-2008 demand entitlement dockets,³ 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

³ Docket Nos. G007/M-07-1402; G007/M-07-1403; G007/M-07-1404; and G007/M-07-1405.

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-10-1168; 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 trueup 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. <u>Design-Day Deliverability Changes</u>

As shown in Attachment 3, MERC-NNG proposes no change in Design-Day Deliverability. The reserve margin for 2017-2018 is slightly negative. MERC will purchase city gate delivered supply to cover 0.19% of peak day throughput if necessary. This reserve margin is appropriate because incremental NNG capacity will come on line in 2018 as a result of the Rochester expansion project.

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 (storage) pipeline entitlements that are not included in peak day deliverability. MERC has increased the volume of capacity release NNG storage acquired from a total of 1,200,000 dth in 2016-2017 to 1,500,000 dth in 2017-2018 as discussed in the update filing for Docket No. G011/M-16-650. 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.

E. Financial Option Units and Premiums

In accordance with the Commission's May 8, 2017, Order in Docket No. G011/M-17-85 approving MERC's variance extension request to recover the costs of financial instruments

through the PGA, MERC provides the following information. <u>MERC has completed its purchases</u> of future contracts and call options for the 2017-2018 winter period. These final financial hedge volumes and costs are shown in Attachments 5 and 11 (pages 1 and 3). The call option premium costs additionally flow through the spreadsheet in Attachment 4, pages 1 and 2 and in Attachment 8.÷

- 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 dth) 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 2017-2018 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 (10% futures and 20% options). The weighted average price of currently purchased futures contracts of natural gas for the 2017/18 winter is \$3.<u>2945</u>3991/dth. 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 \$2.6781/dth. MERC has purchased call options at an average strike price of \$3.83117985/dth, 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 demandrelated costs in its monthly PGA effective November 1, 2017. 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. <u>Conclusion</u>

<u>MERC respectfully requests that the Commission approve the requested changes to be</u> <u>recovered in the Purchased Gas Adjustment (PGA) beginning November 1, 2017. If any</u> changes to the entitlements for MERC-NNG are made, MERC will submit an update to this filing by November 1, 2017. DATED: August November 1, 2017

Respectfully submitted,

MINNESOTA ENERGY RESOURCES CORPORATION

By: <u>/s/ Amber S. Lee</u> Amber S. Lee 1995 Rahncliff Court, Suite 200 Eagan, MN 55122 Telephone: (651) 322-8965

Attachment 1 Page 1 of 3

MINNESOTA ENERGY RESC DESIGN-DAY DEMAND SUM	MMARY	- NNG
NOVEMBER 1, 2017 NNG]	
Design Day Requirement		266,825
Total Peak Day Entitlement		266,317
2016/17 Firm Peak Day Actual Sendout	1/5/2017	212,653
Firm Annual Throughput - Minnesota		23,618,091
No. of Firm Customers		187,194
Department Load Factor Calculation		30.43%

Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG

Attachment 1 Page 2 of 3

MINNESOTA ENERGY RESOURCES - NNG

NNG MINNESOTA DESIGN DAY REQUIREMENTS

NOVEMBER 1, 2017

ſ	Pipeline	2016/17	Zone Total	1/20	Regression Factors		Regression	Regression	1/20 Requirements	Estimated	
	Group	Customer	Customer	Design	Intercept	Slope	Total	Adjustment	Regression Load	Contract	Total *
		Count	Count	DDD						Demand Units	

	PEAK											
NNG Total	187,194 187,194	187,194 187,194	98	17,443	2,139	251,482	15,248	266,730	95	266,825 266,825		

	OFF PEAK											
NNG Total	187,194 187,194	187,194 187,194	55	17,443	2,139	146,377	15,248	161,625	95	161,720 161,720		

* Adjusted for customer growth

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

> Attachment 1 Page 3 of 3

MI	NNESOTA ENEF	RGY RESOURCES	- NNG
		AND PER CUSTOMER - GS MBER 1, 2017	
	NOVE	NNG	
Heating <u>Season</u>	No. of Firm <u>Customers</u>	Design Day <u>Requirements</u>	MMBtu /Customer <u>/Day</u>
17/18	187,194	266,825	1.43
16/17	184,577	248,796	1.35
15/16	181,326	245,263	1.35
14/15	178,388	261,002	1.38
13/14	178,578	245,878	1.28
12/13	176,937	225,883	1.34
11/12	175,241	235,055	1.24
10/11	176,027	218,213	1.30
09/10	175,228	228,040	1.42
08/09	173,962	247,188	1.30

Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG

> Attachment 2 Page 1 of 1

MINNESOTA ENERGY RESOURCES - NNG

SUMMER/WINTER USAGE - Mcf PROJECTED 12 MONTHS ENDING JUNE 2018 NNG

<u>Class</u>	Summer <u>Apr-Oct</u>	Winter <u>Nov-Mar</u>	<u>Total</u>
GS SVI SVJ LVI LVJ SLV	6,013,697 436,673 5,791 552,509	17,589,346 1,255,514 9,257 568,478	23,603,043 1,692,187 15,048 1,120,987 0 0
Total	<u>7,008,670</u>	<u>19,422,595</u>	<u>26,431,265</u>

Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG Attachment 3 NNG

MINNESOTA ENERGY RESOURCES - NNG

ENTITLEMENT LEVELS PROPOSED TO BE EFFECTIVE NOVEMBER 1, 2017

	Summer		A	oril/Octol	ber		Winter	
2016/17	Change	Proposed	2016/17	Change	Proposed	2016/17	Change	Proposed
<u>MMBtu</u>	<u>MMBtu</u>	<u>MMBtu</u>	<u>MMBtu</u>	<u>MMBtu</u>	<u>MMBtu</u>	<u>MMBtu</u>	<u>MMBtu</u>	<u>MMBtu</u>
75.040	0.000	04 700	75.040	0 000	04 700	75.040	0	75.040
	•	•			-			75,316
-						,		45,668
		-	-		-			32,297
-			-	_				109,501
Ũ		•	,	-	,	•		0
50,000	0	50,000	,	0	50,000	50,000	0	50,000
50,000	0	50,000	50,000	0	50,000	50,000	0	50,000
2,500	0	2,500	2,500	0	2,500	2,500	0	2,500
1,035	0	1,035	1,035	0	1,035	1,035	0	1,035
0	0	0	0	0	0	0	0	0
111,148	9,393	120,541	113,148	9,393	122,541	252,127	14,190	266,317
						2/18 706	18 020	266,825
						240,730	10,023	200,020
			152,070	9,650	161,720			
						3,331	(3,839)	(508)
			(38.922)	(257)	(39.179)			
			(,-=)	()	(00,0)			
Total entitle	ement							
		N3	-25.59%	1.37%	-24.23%	1.34%	-1.53%	-0.19%
	<u>MMBtu</u> 75,316 0 32,297 0 50,000 2,500 1,035 0 111,148	2016/17 Change MMBtu 75,316 9,393 0 0 32,297 0 0 0 50,000 0 50,000 0 2,500 0 1,035 0 0 0	MMBtu MMBtu MMBtu 75,316 9,393 84,709 0 0 0 32,297 0 32,297 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 50,000 0 50,000 2,500 0 2,500 1,035 0 1,035 0 0 0 111,148 9,393 120,541	2016/17 Change Proposed MMBtu 2016/17 MMBtu 75,316 9,393 84,709 75,316 0 0 0 0 32,297 0 32,297 32,297 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 50,000 0 50,000 50,000 50,000 2,500 0 2,500 2,500 1,035 1,035 0 1,035 1,035 0 0 0 0 0 0 0 111,148 9,393 120,541 113,148 152,070	2016/17 Change Proposed 2016/17 Change MMBtu MMBtu MMBtu MMBtu MMBtu MMBtu 75,316 9,393 84,709 75,316 9,393 0 0 0 0 0 0 32,297 0 32,297 0 0 0 0 0 0 0 0 0 0 0 0 0 11035 0 0 0 0 152,070 9,650 (38,922) <	2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu Proposed MMBtu 75,316 9,393 84,709 75,316 9,393 84,709 0 0 0 0 0 0 0 32,297 0 32,297 32,297 0 32,297 0 32,297 0 <td>2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 MMBtu Mustue Mustue Mustu</td> <td>2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 Change MMBtu Mutha Mutha</td>	2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 MMBtu Mustue Mustue Mustu	2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 Change Proposed MMBtu 2016/17 Change MMBtu Mutha Mutha

									Page 1 of 3
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			CT OF THE PRO			9			
			NOVEMBE		IND CHANGE				
				,					
All costs in	Base	Demand	Demand	Most	Proposed	F	Result of Propo	sed Chang	e
\$/Dth	Cost of	Charge	Charge	Recent	Effective	Change	Change	Change	Change
	Gas			PGA		from	from	from	from
	G011/MR15-748 Jul 1, 2017	Oct 1, 2016	Demand Filing Nov 1, 2016	Jul 1, 2017	Nov 1, 2017	Last Rate	Nov 1, 2016 Demand	Last PGA	Last PGA
	Jul 1, 2017	0011,2018	NOV 1, 2010	Jul 1, 2017	NOV 1, 2017	Case	Filing	rga %	FGA \$
I	L.		1			0400	·9	<i>,</i> ,,	*
1) General Service Res	sidential: Avg. Annual Use:	88		Dth					
Commodity Cost	\$3.2257	\$4.3217	\$4.3217	\$3.2257	\$3.0616	(\$0.1641)	(\$1.2601)	-5.09%	(\$0.1641)
Demand Cost	\$0.9288	\$0.9226	\$0.9226	\$0.9288	\$0.9860	\$0.0572	\$0.0634	6.15%	\$0.0572
Commodity Margin	\$2.4116	\$2.3980	\$2.3980	\$2.4116	\$2.4116	\$0.0000	\$0.0136	0.00%	\$0.0000
Total Cost of Gas Avg Annual Cost	\$6.5661 \$577.82	\$7.6423 \$672.52	\$7.6423 \$672.52	\$6.5661 \$577.82	\$6.4592 \$568.41	(\$0.1069) (\$9.41)	(\$1.1831) (\$104.12)	-1.63% -1.63%	(\$0.1069) (\$9.41)
	modity change on average annua		ψ072.52	\$J11.02	\$300.41	(\$9.41)	(\$104.12)	-1.0376	(\$14.44)
	and change on average annual b								\$5.03
2) Small Vol. Interrupti		5,110	¢ + 00 +	Dth	# 0.0015	(00.101)	(#1.000.00	E 0001	/*** ****
Commodity Cost Demand Cost	\$3.2257	\$4.3217	\$4.3217	\$3.2257	\$3.0616	(\$0.1641)	(\$1.2601)	-5.09%	(\$0.1641)
Commodity Margin	\$0.9740	\$0.9336	\$0.9336	\$0.9740	\$0.9740	\$0.0000	\$0.0404	0.00%	\$0.0000
Total Cost of Gas	\$4.1997	\$5.2553	\$5.2553	\$4.1997	\$4.0356	(\$0.1641)	(\$1.2197)	-3.91%	(\$0.1641)
Avg Annual Cost	\$21,460.47	\$26,854.58	\$26,854.58	\$21,460.47	\$20,621.92	(\$838.55)	(\$6,232.67)	-3.91%	(\$838.55)
	modity change on average annua								(\$838.55)
Effect of proposed dema	and change on average annual b	ills:							\$0.00
3) Large Vol. Interruptib		16.150		Dth					
Commodity Cost	\$3.2257	\$4.3217	\$4.3217	\$3.2257	\$3.0616	(\$0.1641)	(\$1.2601)	-5.09%	(\$0.1641)
Demand Cost	•••••	• ··· · ·	• · · • = · ·	+		(++++++)	(+		(********)
Commodity Margin	\$0.5329	\$0.5007	\$0.5007	\$0.5329	\$0.5329	\$0.0000	\$0.0322	0.00%	\$0.0000
Total Cost of Gas	\$3.7586	\$4.8224	\$4.8224	\$3.7586	\$3.5945	(\$0.1641)	(\$1.2279)	-4.37%	(\$0.1641)
Avg Annual Cost	\$60,701.39	\$77,881.76	\$77,881.76	\$60,701.39	\$58,051.18	(\$2,650.22)	(\$19,830.59)	-4.37%	(\$2,650.22)
	modity change on average annua and change on average annual b								(\$2,650.22) \$0.00
	and change on average annual b								ψ0:00
4) Small Vol. Firm: Avg.	Annual Use:	5,110		Dth					
		25		DTh			-		
Commodity Cost	\$3.2257	\$4.3217	\$4.3217	\$3.2257	\$3.0616	(\$0.1641)	(\$1.2601)	-5.09%	(\$0.1641)
Demand Cost	\$27.6780	\$10.1722	\$10.1722	\$27.6780	\$10.1817	\$0.0000	\$0.0095 \$0.0404	-63.21% 0.00%	(\$17.4963)
Commodity Margin Demand Margin	\$0.9740 \$3.0000	\$0.9336 \$2.7493	\$0.9336 \$2.7493	\$0.9740 \$3.0000	\$0.9740 \$3.0000	\$0.0000 \$3.0000	\$0.0404 \$0.2507	0.00%	\$0.0000 \$0.0000
Total Cost of Gas	\$3.0000 \$4.1997	\$5.2553	\$5.2553	\$3.0000 \$4.1997	\$3.0000	(\$0.1641)	(\$1.2197)	-3.91%	(\$0.1641)
Total Demand Cost	\$30.6780	\$12.9215	\$12.9215	\$30.6780	\$13.1817	(\$17.4963)	\$0.2602	-57.03%	(\$17.4963)
Avg Annual Cost	\$22,227.42	\$27,177.62	\$27,177.62	\$22,227.42	\$20,951.46	(\$1,275.96)	(\$6,226.16)	-5.74%	(\$1,275.96)
	modity change on average annua						• • •		(\$838.55)
Effect of proposed dema	and change on average annual b	ills:							(\$437.41)
5) Large Vol. Firm: Avg.	Annual Llag	16,150		Dth					
5) Large Vol. Firm: Avg.	Annual Use:	75		Dth					
Commodity Cost	\$3.2257	\$4.3217	\$4.3217	\$3.2257	\$3.0616	(\$0.1641)	(\$1.2601)	-5.09%	(\$0.1641)
Demand Cost	\$27.6780	\$10.1722	\$10.1722	\$27.6780	\$10.1817	(\$17.4963)	\$0.0095	-63.21%	(\$17.4963)
Commodity Margin	\$0.5329	\$0.5007	\$0.5007	\$0.5329	\$0.5329	\$0.0000	\$0.0322	0.00%	\$0.0000
Demand Margin	\$3.0000	\$2.7493	\$2.7493	\$3.0000	\$3.0000	\$0.0000	\$0.2507	0.00%	\$0.0000
Total Cost of Gas	\$3.7586	\$4.8224	\$4.8224	\$3.7586	\$3.5945	(\$0.1641)	(\$1.2279)	-4.37%	(\$0.1641)
Total Demand Cost	\$30.6780 \$62.002.24	\$12.9215	\$12.9215	\$30.6780	\$13.1817	\$13.1817	\$0.2602	-57.03%	(\$17.4963)
Avg Annual Cost	\$63,002.24 modity change on average annua	\$78,850.87	\$78,850.87	\$63,002.24	\$59,039.80	(\$1,661.59)	(\$19,811.07)	-6.29%	(\$3,962.44)
	and change on average annual b								(\$1,312.22)
Encor or proposed dema	and change on average annual b								(Ψ1,012.22)

Note: Average Annual Average based on NNG Annual Automatic Adjustment Report in Docket No. E,G999/AA-17-XXX

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

				NOVEN	MBER 1, 20 NNG	017					
V. NORTHER	N NATURAL GAS COMPANY'S	RATES CURRE	NT COST OF GA	AS EFFE					01-Nov-17		
			-Summer(7 mths)					GRI	Total		
	TF-12B	112495 \$		\$	10.230		\$7.5776	\$0.0000	\$7.5776		
	TF-12B Discount TF-12V	112495 S 112495 S		\$ \$	10.032 13.866		\$7.4951 \$9.0926	\$0.0000 \$0.0000	\$7.4951 \$9.0926		
	TF-5	112495		\$	15.153		\$15.1530	\$0.0000	\$15.1530		
	TFX	112486 \$	\$ 5.6830	\$	15.153	30	\$9.6288	\$0.0000	\$9.6288		
	TFX-5	112486 \$		\$	15.153		\$15.1530	\$0.0000	\$15.1530		
	TFX-5 Discount	112486 \$		\$	10.032		\$10.0320	\$0.0000	\$10.0320		
	TFX - Discount TFX - Discount	111866 S 111866 S		\$ \$	15.139 4.864		\$7.6025 \$4.8640	\$0.0000 \$0.0000	\$7.6025 \$4.8640		
	TFX - Discount	111866 \$		\$	5.472		\$5.4720	\$0.0000	\$5.4720		
	TFX-5	127852		\$	15.153	30	\$15.1530	\$0.0000	\$15.1530		
	Gas Cost								\$2.2444	/Dth	1
	ALES As approved in Docket I		8						253,351,745		
I. MERC-NNO	G'S CURRENT COST OF GAS I	EFFECTIVE:	Monthly				L	01-Nov-17	J		
			Monthly Entitlements				Rate		Contract		
		Contract #(s)	(Dth)		Months		\$/Dth		Costs	1	Rate/Therm
A. GS-NNG	TF12B (Max Rate) Winter	112495	49,219			5	\$ 10.2300	=	\$2,517,552		0.011
	TF12B (Max Rate) Summer	112495	49,219				\$ 5.6830	=	\$1,957,981	\$	0.0087
	TF12V (Max Rate)	112495	30,290		1		\$ 9.0926 \$ 45.4520	=	\$3,304,978	\$	0.0146
	TF5 (Max Rate) TF12B (Discount-Winter)	112495 112495	36,275 5,200				\$ 15.1530 \$ 7.4951	=	\$2,748,375 \$467,694	\$ \$	0.0122
	TFX12 (Max Rate)	112495	10,822				\$ 9.6288	=	\$1,250,434		0.0020
	TFX Apr (Max Rate)	112486	2,000				\$ 5.6830	=	\$11,366	\$	0.000
	TFX Oct (Max Rate)	112486	2,000				\$ 5.6830	=	\$11,366	\$	0.0000
	TFX5 (Max Rate)	112486	82,688				\$ 15.1530	=	\$6,264,856	\$	0.0278
	TFX5 (Discount) TFX12 (Discount)	112486	1,800				\$ 10.0320 \$ 4.8640	=	\$90,288 \$74,886	\$ \$	0.0004
	TFX12 (Discount)	111866 111866	1,283 8,271				\$ 4.8640 \$ 5.4720	=	\$74,886 \$543,107		0.00024
	TFX12 (Discount)	111866	11,921				\$ 7.6025	=		\$	0.0048
	TFX5 (Discount)	111866	379				\$ 4.8640	=	\$9,217	\$	0.0000
	TFX5 (Discount)	111866	2,445				\$ 5.4720	=	\$66,895	\$	0.0003
	TFX5 (Discount)	111866	22,189				\$ 15.1392	=	\$1,679,619	\$	0.0074
	Windom Northwestern Energy	118657	2,500 1,035				\$- \$8.3382	=	\$0 \$103,560	\$ \$	0.0004
	Total Demand Cost								\$22,189,727	\$	0.0986
	As approved in Docket No.	G011/MR-15-748							225,057,235		
	GS-1 Demand Current Cost									\$	0.0986
	GS-1 Commodity Current C									\$ \$	0.3061 0.4047
	Total GS-1 Current Cost of	Gas/therm								φ	0.4047
3. GS-NNG, S	VI-NNG, LVI-NNG, SJ-NNG, LJ-	NNG, SLV-Commo	-								
			Monthly				D /				
			Entitlement (Dth)		Months		Rate (\$/Dth)	Contract Costs	Contract Costs		Rate (\$/therm)
	FDD - Reservation	118657	87,058			12	\$ 1.7140	=	\$1,790,633	\$	0.0070
	FDD - Storage Cycle	118657	1,003,864				\$ 0.3567	=	\$1,790,392		0.0070
	FDD - Reservation	132024	17,345		1	12	\$ 1.7140	=	\$356,748	\$	0.0014
	FDD - Storage Cycle	132024	200,000				\$ 0.3567	=	\$356,700	\$	0.0014
	FDD - Reservation	132112	8,672		1		\$ 1.7140	=	\$178,374		0.0007
	FDD - Storage Cycle Firm Deferred Delivery Sto	132112	100,000			5	\$ 0.3567	=	\$178,350	\$ ¢	0.0007
er Docket No.	Firm Deferred Delivery Sto G-007/M-07-1402-05 dated Aug		e demand charges	will be a	allocated thro	ough	the commod	ity charge effective	\$4,651,197 11/1/2014.	\$	0.0183
						0.					
			Monthly				_	_	_		
			Entitlement		Months		Rate	Contract	Contract		Rate
	Bison	ET0003	(Dth)		Months	12	(\$/Dth)	Costs	Costs \$10,493,750	¢	(\$/therm) 0.0414
	Bison NBPL	FT0003 T8673F	50,000 50,000			12 12	\$ 17.4896 \$ 6.9958	=	\$10,493,750 \$4,197,500	ֆ Տ	0.0414
			66,000			-			\$14,691,250	\$	0.0579
	007/04 40 4400 and 0 044/04 40	0-1168 dated Janua	ry 26, 2015, recov	er the co	osts associat	ted v	with Bison con	tract through comm			
'er Doct No. G	-007/10-10-1166 and G-011/10-10								Data C		
²er Doct No. G	-007/M-10-1166 and G-011/M-10		A						Rate Case		
Per Doct No. G	-007/M-10-1166 and G-011/M-10		Annual				Rate	Commodity			Rate
Per Doct No. G	-007/14-10-1166 and G-011/14-10		Sales				Rate (\$/Dth)	Commodity Cost	Sales		Rate (\$/therm)
Per Doct No. G	CD-1 Commodity	_			x		Rate (\$/Dth) \$2.2444	Commodity Cost \$56,862,266		\$	(\$/therm)
Per Doct No. G		-	Sales (Dth)		x x		(\$/Dth)	Cost	Sales (therm)	\$ \$	(\$/therm) 0.2244
Per Doct No. G	CD-1 Commodity	- əmium	Sales (Dth) 25,335,175		x x		(\$/Dth) \$2.2444	Cost \$56,862,266	Sales (therm) 253,351,745		(\$/therm) 0.2244 0.0023
Per Doct No. G	CD-1 Commodity SMS-Bal Service	- əmium	Sales (Dth) 25,335,175		x x		(\$/Dth) \$2.2444	Cost \$56,862,266 \$593,309	Sales (therm) 253,351,745 253,351,745	\$	

Attachment 4

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MINNESOTA ENERGY RESOURCES - NNG

RATE IMPACT OF THE PROPOSED DEMAND CHANGE

		_	NOVEMBER	1, 2017			
			NNG				
COSTS ASSIGNED IN JOINT F	RATE:						
	<u>Units</u>	Contract #	<u>Month</u>	<u>\$/Dth</u>		Cost	<u>\$/therm</u>
TF12B (Max Rate) Winter	49,219	112495	5	\$10.2300	=	\$2,517,552	\$0.11552
TF12B (Max Rate) Summer	49,219	112495	7	\$5.6830	=	\$1,957,981	\$0.08984
TF12V (Max Rate)	30,290	112495	12	\$9.0926	=	\$3,304,978	\$0.15165
TF5 (Max Rate)	36,275	112495	5	\$15.1530	=	\$2,748,375	\$0.12611
TF12B (Discount-Winter)	5,200	112495	12	\$7.4951	=	\$467,694	\$0.02146
TFX12 (Max Rate)	10,822	112486	12	\$9.6288	=	\$1,250,434	\$0.05738
TFX Apr (Max Rate)	2,000	112486	1	\$5.6830	=	\$11,366	\$0.00052
TFX Oct (Max Rate)	2,000	112486	1	\$5.6830	=	\$11,366	\$0.00052
TFX5 (Max Rate)	82,688	112486	5	\$15.1530	=	\$6,264,856	\$0.28746
TFX5 (Discount)	1,800	112486	5	\$10.0320	=	\$90,288	\$0.00414
TFX12 (Discount)	1,283	111866	12	\$4.8640	=	\$74,886	\$0.00344
TFX12 (Discount)	8,271	111866	12	\$5.4720	=	\$543,107	\$0.02492
TFX12 (Discount)	11,921	111866	12	\$7.6025	=	\$1,087,553	\$0.04990
TFX5 (Discount)	379	111866	5	\$4.8640	=	\$9,217	\$0.00042
TFX5 (Discount)	2,445	111866	5	\$5.4720	=	\$66,895	\$0.00307
TFX5 (Discount)	22,189	111866	5	\$15.1392	=	\$1,679,619	\$0.07707
Windom	2,500	118657	12	\$0.0000	=	\$0	\$0.00000
Northwestern Energy	1,035		12	\$8.3382	=	\$103,560	\$0.00475
			тс	TAL		\$22,189,728	
			An	nualized Entitlement		21,793,720	
			De	emand Component		<u>\$1.01817</u>	\$1.01817

Attachment 5

MINNESOTA ENERGY RESOURCES - CONSOLIDATED

Financial Options

									H		ting Seas		-	18									
Units ·	- Ga	is Daily Pe	aker Pa	ckages	(Physical)																		
		Nove	ember		De	ecem	<u>iber</u>		Jar	uary	Y		Feb	orua	ry		Ma	arch					
	С	ontract	Da	ily	Contract		Daily	Co	ntract		Daily	C	ontract		Daily	С	ontract		Daily		Daily		Term
		Date	Volu	<u>ime</u>	Date		<u>Volume</u>		Date	<u> </u>	<u>Volume</u>		Date		<u>Volume</u>		Date	7	/olume		<u>Total</u>		<u>Total</u>
		N/A			N/A				N/A				N/A				N/A						
Premi	um	- Gas Daily	-	r (Mont	• •																		
			ember Drow			ecem	<u>iber</u> Premium	~		nuary	<u>Y</u> Premium			orua	<u>ry</u> Premium			arch	remium		Ontion	<u>Tota</u>	<u>I</u> Premium
		Option Premium	Prem Co		Option Premium		Cost		ption emium	г	Cost		Option remium		Cost		Option Premium	г	Cost		Option Premium		Cost
	-	N/A	<u></u>	<u></u>	N/A		<u></u>		N/A		0000	-	N/A		<u>0001</u>	-	N/A		<u></u>	-	<u>roman</u>		<u></u>
Unito	E	tures (Dth	`																				
<u>Units</u>	<u>- ru</u>		<i>i</i> ember		De	ecem	ber		Jar	uary	v		Feb	orua	rv		Ma	arch					
	с	ontract	Da	ily	Contract		Daily	Co	ntract		Daily	С	ontract		Daily	с	ontract		Daily		Term		
		Date	Volu	-	Date		Volume		Date	1	Volume		Date		Volume		Date	١	/olume		Total		
1	C	05/15/17		1,896	05/25/17		2,688		5/22/17	-	2,926	0	5/17/17		2,941	0	05/19/17	-	2,395		387,513		
2	0	06/07/17		1,354	06/21/17		2,688	06	6/19/17		2,926	0	6/08/17		2,941	(06/14/17		1,863		354,763		
3	0	07/11/17		1,354	07/21/17		1,882	07	7/18/17		2,660	0)7/12/17		2,647	(07/17/17		798		280,282		
4	0	08/01/17		1,354	08/24/17		1,882	08	3/21/17		2,394	0	8/07/17		2,353	(07/17/17		798		263,801		
5	0	09/05/17		1,354	09/19/17		1,882	09	9/14/17		2,128	0	9/07/17		2,059	0	08/10/17		1,597		272,070		
6	1	10/03/17		1,354	10/17/17		1,882	10)/18/17		2,128	1	0/05/17		2,059	0	09/12/17		1,597		272,070		
7																1	10/12/17		1,597		49,500		
8																							
Total				8,667			12,903				15,161				15,000				10,645	1	1,880,000		
Units ·	- Ca	II Options	(Dth)																				
		Nove	ember		D	ecem	nber		Jar	nuary			Feb	orua	iry		Ma	arch					
	С	Contract	Da	ily	Contract		Daily	Co	ontract		Daily	С	ontract		Daily	С	Contract		Daily		Term		
		Date	Volu	ıme	Date		Volume		Date		Volume		Date		Volume		Date	`	Volume		Total		
1	C	05/15/17		3,313	05/19/17		4,533	05	5/18/17		5,596	0)5/25/17		5,305	()5/22/17		3,943		684,129		
2		06/07/17		3,313	06/14/17		4,533		6/08/17		5,330		6/21/17		5,305		06/19/17		3,943		675,869		
3)7/11/17		3,036	07/17/17		4,533		7/12/17		5,063)7/21/17		5,305		07/18/17		3,943		659,326		
4		08/01/17		2,760	08/10/17		4,533		3/07/17		5,063		8/24/17		5,010		08/21/17		3,154		618,348		
5		09/05/17		2,760	09/12/17		4,266		9/07/17		4,797		9/19/17		4,716		09/14/17		3,154		593,570		
6	1	10/03/17		2,484	10/12/17		3,733	10)/05/17		4,797	1	0/17/17		4,716	1	10/18/17		3,154		568,758		
7																							
8 Total			1	17,667			26,129				30,645				30,357				21,290	3	3,800,000		
Premi	um	- Call Opti	on (Mor	nthly Co	ost)																		
		-	ember		-	ecem	nber		Jar	nuary	/		Feb	orua	ry		Ma	arch				Tota	I
		Option	Prem	nium	Option		Premium	C	Option	F	Premium		Option		Premium		Option	P	remium		Option		Premium
	F	Premium	Co	ost	Premium		Cost	Pr	emium		Cost	Ρ	remium		Cost	F	Premium		Cost	F	Premium		Cost
1	\$	0.3060	\$ 3	30,409	\$ 0.276	0 \$	38,781	\$	0.2790	\$	48,400	\$	0.2670		39,661	\$	0.2820	\$	34,467	\$	0.2802	\$	191,718
2	\$	0.2260	\$ 2	22,459	\$ 0.261	0 \$	36,673	\$	0.2560	\$	42,296	\$	0.2710	\$	40,255		0.2720	\$	33,244	\$	0.2588	\$	174,927
3	\$	0.1790		16,306					0.2720		42,692		0.2590		38,473		0.3150		38,500		0.2646		174,471
4	\$	0.1000		8,281					0.0950		14,911		0.0970		13,608		0.1000		9,778		0.0981		60,629
5	\$	0.0850	\$	7,039				\$	0.0970			\$	0.1000		13,204			\$	9,582		0.0964		57,209
6	\$	0.0970	\$	7,230					0.0940		13,977		0.1000		13,204		0.0970	\$	9,484	\$	0.0957	-	54,425
7	\$	-	\$	-	\$-	\$		\$	-	\$	-	\$	-	\$	-	\$	-	\$	-			\$	-
8	\$	-	\$	-	\$ -	\$		\$	-	\$	-	\$	-	\$	-	\$	-	\$	-			\$	-
Total	\$	0.1731	\$ 9	91,723	\$ 0.187	υ\$	151,495	\$	0.1860	\$	176,700	\$	0.1864	\$	158,405	\$	0.2046	\$	135,056	\$	0.1877	\$	713,379

Units - Collar Floor (put) No Puts were purchased.

Attachment 6 Page 1 of 2

17/18 Winter Portfolio Plan - NNG MERC Hedging Plan

		Со	ntracts	Co	ntracts	Co	ntracts	Cor	ntracts	Cor	ntracts	Т	otal	Percent
	Purchase	Number	Contract	of										
System	Month	Contracts	Volume	Requirement										
VN Requirements			2,666,421		4,073,091		4,832,256		4,255,202		3,347,470		19,174,439	19,174,439
NNG -MERC			88,881		131,390		155,879		151,971		107,983		126,942	
10%	Futures		266,642		407,309		483,226		425,520		334,747		1,917,444	
20%	Call		533,284		814,618		966,451		851,040		669,494		3,834,888	
30%	Storage		799,926		1,221,927		1,449,677		1,276,561		1,004,241		5,752,332	
40%	Index		1,066,568		1,629,236		1,932,902		1,702,081		1,338,988		7,669,776	
Futures														
Contracts	May-17	6	60,000	8	80,000	9	90,000	8	80,000	7	70,000	38	380,000	
	Jun-17	4	40,000	8	80,000	9	90,000	8	80,000	6	60,000	35	350,000	
	Jul-17	4	40,000	6	60,000	8	80,000	7	70,000	5	50,000	30	300,000	
	Aug-17	4	40,000	6	60,000	7	70,000	7	70,000	5	50,000	29	290,000	
	Sep-17	4	40,000	6	60,000	7	70,000	6	60,000	5	50,000	28	280,000	
	Oct-17	4	40,000	6	60,000	7	70,000	6	60,000	5	50,000	28	280,000	
	Total	26	260,000	40	400,000	47	470,000	42	420,000	33	330,000	188	1,880,000	9.80%
Call Options	May-17	10	100,000	14	140,000	17	170,000	15	150,000	12	120,000	68	680,000	
	Jun-17	10	100,000	14	140,000	16	160,000	15	150,000	12	120,000	67	670,000	
	Jul-17	9	90,000	14	140,000	16	160,000	15	150,000	12	120,000	66	660,000	
	Aug-17	8	80,000	14	140,000	16	160,000	14	140,000	10	100,000	62	620,000	
	Sep-17	8	80,000	13	130,000	15	150,000	13	130,000	10	100,000	59	590,000	
	Oct-17	8	80,000	12	120,000	15	150,000	13	130,000	10	100,000	58	580,000	
	Total	53	530,000	81	810,000	95	950,000	85	850,000	66	660,000	380	3,800,000	19.82%
Collars	May-17													
	Jun-17													
	Jul-17													
	Aug-17													
	Sep-17													
	Oct-17													
	Total													0.00%
ndex (back financial)														
	Total		790,000		1,210,000		1,420,000		1,270,000		990,000		5,680,000	29.62%
Physical Hedges														
Storage			586,884		1,474,734		1,474,734		1,474,734		586,884		5,597,969	29.19%
Prepaid Obl														0.00%
Term Index														0.00%
Total NNG MN														
Futures													1,880,000	9.80%
Call Options													3,800,000	19.82%
Costing Collar														0.00
Storage													5,597,969	29.19
Prepaid Obl														0.00
Term Index														0.00
Nonth/Daily													7,896,471	41.189
Total													19,174,439	100.00%

Attachment 6 Page 2 of 2

MINNESOTA ENERGY RESOURCES

NNG WINTER PLAN NOVEMBER, 2015 THROUGH MARCH, 2016

			,		- ,		Daily Volume	s		Monthly
PHYSICAL FIXED PRICE HEDGE	<u>s</u>	Trigger	Trigger		Nov	Dec	Jan	Feb	Mar	Total
	Deal #	Locked	Exercised	Receipt Point						
										-
No Physical Fixed Price Hedges										-
	Total Actual Fixed/C	Option Physical		_	-	-	-	-	-	-
INDEX	Contract									
	Number	Date	Receipt Point	Nov	Dec	<u>Jan</u>	Feb	Mar	Total	
	48980	4/28/2017	NBPL Port of Morgan		10,000	10,000	10,000		900,000	
	48982	4/28/2017	NBPL Port of Morgan	20,000	20,000	20,000	20,000	20,000	3,020,000	
	49012	4/28/2017	NBPL Port of Morgan		10,000	10,000	10,000		900,000	
	49014	4/28/2017	NBPL Port of Morgan		10,000	10,000	10,000		900,000	
	48981	4/28/2017	NNG Ventura	10,846	10,846	10,846	10,846	10,846	1,637,746	
	49013	4/28/2017	NNG Demarc		5,000	5,000	5,000		450,000	
	49017	4/28/2017	NNG/GLGT Carlton	8,000	8,000	8,000	8,000	8,000	1,208,000	
	49018	4/28/2017	NNG/GLGT Grand Rapids	6,064	6,064	6,064	6,064	6,064	915,664	
	49019	4/28/2017	NNG/GLGT Carlton		5,000	5,000	5,000		450,000	
	Total Actual Season	al Index		44,910	84,910	84,910	84,910	44,910	4,661,410	
GAS DAILY PACKAGES										
Physical Call Option	49015	4/28/2017	NNG Ventura	-	10,000	10,000	10,000	-		
Physical Call Option	49016	4/28/2017	NNG Ventura	-	20,000	20,000	20,000	-		
					,	,	,			
STORAGE										
	K#118657	K#132024	K#132112	Total						
Injection	Volume	Volume	Volume	Volume						
Month	Injected	Injected	Injected	Injected						
May - balance forward	0	0	0	0						
June	984,181	98,039	196,078	1,278,298						
July	1,016,987	101,307	202,614	1,320,908						
August	1,016,987	101,307	202,614	1,320,908						
Sept	984,181	98,039	196,078	1,278,298						
Oct (est)	1,016,987	101,307	202,614	1,320,908						
Total	5 010 221	500.000	1 000 000	6 510 221						

1,000,000

6,519,321

Total

5,019,321

500,000

Attachment 7 NNG

MINNESOTA ENERGY RESOURCES - NNG

Design Day Customer Requirements moving to Transportation 2005-6	GS	NNG GS	NNG GS	NNG GS	NNG GS	Proposed Change
Customer Requirements moving to Transportation 2005-6	245,878	261,002	245,263	248,796	266,825	18,029
· · · ·						
Adjusted Design Day	00.400/	00.070/	00.400/	00 7404		0.740/
Design Day Percentages	28.43%	28.07%	32.40%	29.71%	30.43%	0.71%
Total Design Day Capacity (includes non-recallable capacity)	256,385	266,385	252,127	252,127	266,317	14,190
_ess: Windom	2,500	2,500	2,500	2,500	2,500	0
_ess: Northwestern Energy	910	910	1,035	1,035	1,035	0
Total Design Day Capacity	252,975	262,975	248,592	248,592	262,782	14,190
Factors for All Winter Capacity	100.00%	100.00%	100.00%	100.00%	100.00%	
Direct Assigned Entitlements in PGA						
TF12B	49153	55019	45,026	45,026	54,419	9,393
TF12V	26926	21060	30,290	30,290	30,290	0
TF5	31515	31515	32,278	32,278	36,275	3,997
TFX12	32297	32297	32,297	32,297	32,297	0
TFX(5)	93084	123084	108,701	108,701	109,501	800
TFX(5) (12-V)					,	0
TFX (April Only)	2000	2000	2,000	2,000	2,000	ů 0
TFX (October Only)	2000	2000	2,000	2,000	2,000	0
Windom	2,500	2,500	2,500	2,500	2,500	0
Northwestern Energy	910	910	1,035	1,035	1,035	0
NNG Zone Delivery Call Option	20,000	0	0	0	0	Ő
Bison *	50,000	50.000	50.000	50.000	50,000	Ō
NBPL *	50,000	50,000	50,000	50,000	50,000	Ō
Total Direct Assignments	256,385	266,385	252,127	252,127	266,317	14,190
_P Peak Shaving	0					0
Total Design Day Capacity	256,385	266,385	252,127	252,127	266,317	14,190
Total Annual Transportation	111,786	111,786	111,148	111,148	120,541	9,393
Total Seasonal Transportation	144,599	154,599	140,979	140,979	145,776	4,797
Total Percent Seasonal	56.4%	58.0%	55.9%	55.9%	54.7%	-1.2%
Reserve Margin	4.27%	2.06%	2.80%	1.34%	-0.19%	-1.5%
Total Design Day Capacity w/ contract demand	256,385	266,385	252,127	252,127	266,317	14,190
Factors	28.43%	28.07%	32.40%	29.71%	30.43%	0.71%
Other Entitlements not included in Peak Day Deliverability	0.000	0.005	0.005	0.000		-
TFX Oct	2,000	2,000	2,000	2,000	2,000	0
TFX Apr FDD Storage Reservation	2,000	2,000	2,000	2,000	2,000 112 075	0 11 275
FDD Storage Reservation	97,463 1,123,864	94,863 1,093,864	94,863 1,093,864	101,800 1,093,864	113,075 1,303,864	11,275 130,000
FDD Maximum Storage Quantity	5,619,321	5,469,321	5,469,321	5,869,321	6,519,321	650,000
SMS	22,680	22,680	22,680	272,160	272,160	050,000

\$20,999,916

\$20,702,954

(\$296,962)

Attachment 8

MINNESOTA ENERGY RESOURCES - NNG Change in Costs due to November 1, 2017 Change in Entitlement Levels and Related Demand Costs **Costs Assigned In Demand** 2016/17 2017/18 Entitlement 2017/18 2016/17 2017/18 Total Annual Cost Contract Entitlements Entitlements Change Months Rate Total Annual Cost Total Annual Cost Change \$480,452 9,393 TF12B (Max Rate) Winter 112495 39,826 49,219 5 \$10,2300 \$2,037,100 \$2,517,552 TF12B (Max Rate) Summer 112495 39,826 49,219 9,393 7 \$5.6830 \$1,584,318 \$1,957,981 \$373,663 TF12V (Max Rate) 112495 30,290 30,290 12 \$9.0926 \$3,304,978 \$3,304,978 \$0 0 TF5 (Max Rate) 112495 32,278 36,275 3,997 \$15.1530 \$2,445,543 \$2,748,375 \$302,833 5 TF12B (Discount-Winter) 112495 5,200 5,200 12 \$7.4951 \$467,694 \$467,694 0 \$0 112486 \$9.6288 \$1,250,434 \$0 TFX12 (Max Rate) 10,822 10,822 0 12 \$1,250,434 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 \$5.6830 \$11,366 \$11,366 \$0 1 \$60,612 TFX5 (Max Rate) 112486 81,888 82,688 800 5 \$15.1530 \$6,204,244 \$6,264,856 TFX5 (Discount) 112486 1,800 1,800 0 5 \$10.0320 \$90,288 \$90,288 \$0 TFX12 (Discount) 111866 12 \$4.8640 \$74,886 \$74,886 \$0 1.283 1.283 0 \$0 TFX12 (Discount) 111866 8.271 8.271 0 12 \$5.4720 \$543,107 \$543,107 \$0 \$0 \$0 TFX12 (Discount) 111866 11,921 11,921 0 12 \$7.6025 \$1.087.553 \$1.087.553 5 TEX5 (Discount) 111866 379 379 0 \$4.8640 \$9.217 \$9.217 \$0 \$0 2,445 \$66.895 TFX5 (Discount) 111866 2.445 0 5 \$5.4720 \$66 895 TFX5 (Discount) 22,189 22,189 \$15.1392 111866 0 5 \$1,679,619 \$1,679,619 \$0 Windom 2 500 0 12 \$0.0000 118657 2 500 \$0 \$0 \$103,560 \$103,560 Northwestern Energy 0 1,035 1,035 12 \$8.3382 \$0 \$1,217,560 \$20,972,169 \$22,189,728 **Total Demand Cost** Costs Assigned In Commodity 2016/17 2017/18 Entitlement 2017/18 2016/17 Entitlement Entitlement Months Entitlements Entitlement Rate/Dth **Total Annual Cost** Change Change Total Cost Upstream Surcharges: Storage (FDD) 118657 80,989 \$1,665,782 87,058 6.069 12 \$ 1.7140 \$1,790,633 \$124,851 FDD - Reservation 118657 70,000 \$ \$ \$1,790,392 FDD - Storage Cycle 933,864 1,003,864 5 0.3567 \$1 665 547 \$124,845 14,743 \$249,716 FDD - Reservation 132024 2,602 17,345 12 1.7140 \$356,748 \$107,032 170,000 FDD - Storage Cycle 132024 30,000 200.000 5 \$ 0.3567 \$249.690 \$356,700 \$107,010 FDD - Reservation 132112 11,274 8,672 (2,602) 12 \$ 1.7140 \$178,366 \$178,374 \$8 FDD - Storage Cycle 132112 130,000 100,000 (30,000)5 \$ 0.3567 \$178,350 \$178,350 \$0 Pipeline FT0003 50,000 50,000 0 12 \$17.4896 \$10,493,750 \$10,493,750 \$0 Bison NBPI 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 \$175,451 \$53,820 (\$121,631) Producer Demand Payments/Option Premium (\$639,077) \$1,352,456 \$713,379

Total Commodity Costs

Attachment 8.1

			MINNES	OTA EN	ERGY RES	OURCES	- NNG				
		Cha	inge in Costs due to No	vember 1, 201	7 Change in Entitle	ment Levels and	Related Dema	nd Costs			
Costs Assigned In Demand		2016/17	2016/17	2017/18	Net Entitlement		2017/18	2016/17	2016/17	2017/18	Net Annual Cost
	Contract		Albert Lea Entitlements		Change	Months	Rate	Total Annual Cost		Total Annual Cost	Change
TF12B (Max Rate) Winter	112495	39,826	3,157	49,219	6,236	5			\$161,481	\$2,517,552	\$318,971
TF12B (Max Rate) Summer	112495	39,826		49,219	0	7		• • • • • • •	\$373,663	\$1,957,981	\$0
TF12V (Max Rate)	112495	30,290	6,236	30,290	(6,236)	12			\$432,342	\$3,304,978	(\$432,342)
TF5 (Max Rate)	112495	32,278	3,997	36,275	0	5			\$302,833	\$2,748,375	\$0
TF12B (Discount-Winter)	112495	5,200		5,200	0	12				\$467,694	\$0
TFX12 (Max Rate)	112486	10,822		10,822	0	12				\$1,250,434	\$0
TFX Apr (Max Rate)	112486	2,000		2,000	0	1	+			\$11,366	\$0
TFX Oct (Max Rate)	112486	2,000		2,000	0	1	φ0.00			\$11,366	\$0
TFX5 (Max Rate)	112486	81,888	800	82,688	0	5			\$60,612	\$6,264,856	\$0
TFX5 (Discount)	112486	1,800		1,800	0	5				\$90,288	\$0
TFX12 (Discount)	111866	1,283		1,283	0	12				\$74,886	\$0
TFX12 (Discount)	111866	8,271		8,271	0	12				\$543,107	\$0
TFX12 (Discount)	111866	11,921		11,921	0	12				\$1,087,553	\$0
TFX5 (Discount)	111866	379		379	0	5		0 \$9,217		\$9,217	\$0
TFX5 (Discount)	111866	2,445		2,445	0	5		20 \$66,895		\$66,895	\$0
TFX5 (Discount)	111866	22,189		22,189	0	5	\$15.13	2 \$1,679,619		\$1,679,619	\$0
Windom	118657	2,500		2,500	0	12				\$0	\$0
Northwestern Energy		1,035		1,035	0	12	\$8.33	\$103,560		\$103,560	\$0
Total Demand Cost								\$20,972,169	\$1,330,930	\$22,189,728	(\$113,370)
Costs Assigned In Commodity		2016/17	2016/17	2017/18	Net Entitlement		2017/18	2016/17	2016/17	Entitlement	Entitlement
Costs Assigned In Commodity		2016/17 Entitlements	2016/17 Albert Lea Entitlements	2017/18 Entitlement	Net Entitlement	Months	2017/18 Rate/Dth	2016/17 Total Annual Cost	2016/17 Albert Lea Cost	Entitlement Total Cost	Entitlement
Costs Assigned In Commodity Upstream Surcharges:		2016/17 Entitlements	2016/17 Albert Lea Entitlements		Net Entitlement Change	Months	2017/18 Rate/Dth	2016/17 Total Annual Cost		Entitlement Total Cost	Entitlement Change
<u>Upstream</u> Surcharges:						Months					
Upstream Surcharges: Storage (FDD)		Entitlements	Albert Lea Entitlements	Entitlement	Change		Rate/Dth	Total Annual Cost	Albert Lea Cost	Total Cost	Change
Upstream Surcharges: Storage (FDD) FDD - Reservation	118657 118657	Entitlements 80,989	Albert Lea Entitlements 6,071	Entitlement 87,058	Change (2)	12	Rate/Dth \$ 1.714	Total Annual Cost	Albert Lea Cost \$124,868	Total Cost \$1,790,633	Change (\$17)
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle	118657	Entitlements 80,989 933,864	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864	Change (2) 0	12 5	Rate/Dth \$ 1.714 \$ 0.356	Total Annual Cost 0 \$1,665,782 7 \$1,665,547	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392	Change (\$17) (\$0)
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation	118657 132024	Entitlements 80,989 933,864 2,602	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345	Change (2) 0 14,743	12 5 12	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748	Change (\$17) (\$0) \$107,032
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Storage Cycle	118657 132024 132024	Entitlements 80,989 933,864 2,602 30,000	Albert Lea Entitlements 6,071 70,000	87,058 1,003,864 17,345 200,000	Change (2) 0 14,743 170,000	12 5 12 5	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 7 \$249,670	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,700	Change (\$17) (\$0) \$107,032 \$107,010
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation	118657 132024	Entitlements 80,989 933,864 2,602	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345	Change (2) 0 14,743	12 5 12 5	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 7 \$249,690 0 \$178,366	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748	Change (\$17) (\$0) \$107,032
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle FDD - Reservation	118657 132024 132024 132112	Entitlements 80,989 933,864 2,602 30,000 11,274	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345 200,000 8,672	(2) 0 14,743 170,000 (2,602)	12 5 12 5 12	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 7 \$249,690 0 \$178,366	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,740 \$178,374	Change (\$17) (\$0) \$107,032 \$107,010 \$8
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle	118657 132024 132024 132112	Entitlements 80,989 933,864 2,602 30,000 11,274	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345 200,000 8,672	(2) 0 14,743 170,000 (2,602)	12 5 12 5 12	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 7 \$249,716 0 \$178,366 7 \$178,350	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,740 \$178,374	Change (\$17) (\$0) \$107,032 \$107,010 \$8
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle Pipeline	118657 132024 132024 132112 132112	Entitlements 80,989 933,864 2,602 30,000 11,274 130,000	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345 200,000 8,672 100,000	(2) (3) (4,743 (170,000 (2,602) (30,000)	12 5 12 5 12 5	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 7 \$178,356 7 \$178,350 96 \$10,493,750	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,700 \$178,374 \$178,350	Change (\$17) (\$0) \$107,032 \$107,010 \$8 \$0
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle Pipeline Bison	118657 132024 132024 132112 132112 FT0003	Entitlements 80,989 933,864 2,602 30,000 11,274 130,000 50,000	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345 200,000 8,672 100,000 50,000	Change (2) 0 14,743 170,000 (2,602) (30,000) 0	12 5 12 5 12 5 12	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.7148 \$ 6.99	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 0 \$178,366 7 \$178,366 7 \$178,350 96 \$10,493,750 88 \$4,197,500	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,700 \$178,374 \$178,350 \$10,493,750 \$4,197,500	Change (\$17) (\$0) \$107,032 \$107,010 \$8 \$0 \$0
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle Pipeline Bison NBPL	118657 132024 132024 132112 132112 FT0003	Entitlements 80,989 933,864 2,602 30,000 11,274 130,000 50,000 50,000	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345 200,000 8,672 100,000 50,000 50,000	(2) (3) (14,743 (170,000) (2,602) (30,000) (30,0	12 5 12 5 12 5 12 5 12 5	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.7148 \$ 6.99	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 0 \$178,366 7 \$1178,366 7 \$1178,350 96 \$10,493,750 88 \$4,197,500	Albert Lea Cost \$124,868 \$124,845	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,700 \$178,374 \$178,350 \$10,493,750 \$4,197,500	Change (\$17) (\$0) \$107,032 \$107,010 \$8 \$0 \$0 \$0 \$0 \$0
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle Pipeline Bison NBPL SMS-Bal Service	118657 132024 132024 132112 132112 132112 FT0003 T8673F	Entitlements 80,989 933,864 2,602 30,000 11,274 130,000 50,000 50,000	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345 200,000 8,672 100,000 50,000 50,000	(2) (3) (14,743 (170,000) (2,602) (30,000) (30,0	12 5 12 5 12 5 12 5 12 5	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.7148 \$ 6.99	Total Annual Cost 0 \$1,665,782 7 \$1,665,747 0 \$249,716 7 \$249,630 0 \$178,366 7 \$178,366 8 \$10,493,750 88 \$4,197,500 90 \$593,309	Albert Lea Cost \$124,868 \$124,845 \$124,845 \$44,472	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,700 \$178,374 \$178,350 \$10,493,750 \$4,197,500 \$593,309 \$53,820	Change (\$17) (\$0) \$107,032 \$107,010 \$8 \$0 \$0 \$0 \$0 \$0 \$0 \$0
Upstream Surcharges: Storage (FDD) FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle FDD - Reservation FDD - Storage Cycle Pipeline Bison NBPL SMS-Bal Service Physical Forward Start Premium	118657 132024 132024 132112 132112 132112 FT0003 T8673F	Entitlements 80,989 933,864 2,602 30,000 11,274 130,000 50,000 50,000	Albert Lea Entitlements 6,071 70,000	Entitlement 87,058 1,003,864 17,345 200,000 8,672 100,000 50,000 50,000	(2) (3) (14,743 (170,000) (2,602) (30,000) (30,0	12 5 12 5 12 5 12 5 12 5	Rate/Dth \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.714 \$ 0.356 \$ 1.7148 \$ 6.99	Total Annual Cost 0 \$1,665,782 7 \$1,665,547 0 \$249,716 7 \$178,366 7 \$178,350 8 \$4,197,500 90 \$593,309 \$175,451	Albert Lea Cost \$124,868 \$124,845 \$44,472 \$52,654	Total Cost \$1,790,633 \$1,790,392 \$356,748 \$356,700 \$178,374 \$178,350 \$10,493,750 \$4,197,500 \$593,309 \$53,820	Change (\$17) (\$0) \$107,032 \$107,010 \$8 \$0 \$0 \$0 (\$44,472) (\$174,285)

Attachment 9

MINNESOTA ENERGY RESOURCES - NNG

Daily Total Throughput Data - July 1, 2016 through June 30, 2017 NNG

Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG Attachment 9

	Daily 10	ai moughpt	NN		Jugii Julie	50, 2017	
						Design Day: Base Variable	17,443 2,139
	13.98%	29.22%	45.15%	11.65%	100.00%	Actual	Estimated
	Cloquet Adjusted	Minneapolis Adjusted	Adjusted	Worthington Adjusted	Adjusted	Total Through-	Firm Through-
Date	HDD	HDD	HDD	HDD	HDD	Put *	Put **
7/1/16 7/2/16	5 3	0 0	3 2	1 1	2 1	138,989 119,267	21,634 20,040
7/3/16	0	0	0	0	0	118,351	17,443
7/4/16	0	0	0	0	0	124,073	17,443
7/5/16	0	0	0	0	0	155,167	17,443
7/6/16 7/7/16	0 1	0 0	0 0	0 0	0 0	150,273 151,894	17,443 17,593
7/8/16	2	0	0	0	0	145,046	17,921
7/9/16	0	0	0	0	0	125,662	17,443
7/10/16	2	0	0	0	0	114,313	17,921
7/11/16 7/12/16	0 0	0 0	0 0	0 0	0 0	121,087	17,443 17,443
7/13/16	0	0	0	0	0	133,973 120,877	17,443
7/14/16	5	0	0	2	1	117,143	19,272
7/15/16	4	0	1	0	1	137,475	19,002
7/16/16 7/17/16	0 0	0 0	0 0	0 0	0 0	115,536 120,474	17,443 17,443
7/18/16	0	0	0	0	0	164,474	17,443
7/19/16	0	0	0	0	0	149,523	17,443
7/20/16	0	0	0	0	0	159,411	17,443
7/21/16 7/22/16	0 0	0 0	0 0	0 0	0 0	169,741 159,383	17,443 17,443
7/23/16	0	0	0	0	0	137,119	17,443
7/24/16	0	0	0	0	0	128,533	17,443
7/25/16	0	0	0	0	0	159,618	17,443
7/26/16 7/27/16	0 5	0 0	0 0	0 0	0 1	157,013 152,327	17,443 18,848
7/28/16	6	0	0	0	1	147,173	19,327
7/29/16	6	0	0	2	1	144,825	19,546
7/30/16 7/31/16	0 0	0 0	0 0	0 0	0 0	133,540	17,443 17,443
8/1/16	0	0	0	0	0	124,401 152,800	17,443
8/2/16	0	0	0	0	0	165,672	17,443
8/3/16	0	0	0	0	0	152,176	17,443
8/4/16 8/5/16	0 1	0 0	0 0	0 0	0 0	138,146 122,449	17,443 17,772
8/6/16	2	0	0	0	0	118,320	17,921
8/7/16	3	0	0	0	0	107,876	18,191
8/8/16	0 0	0 0	0	0 0	0 0	128,201	17,443
8/9/16 8/10/16	2	0	0 0	0	0	136,909 136,607	17,443 17,921
8/11/16	0	0	0	0	0	137,271	17,443
8/12/16	0	0	0	0	0	119,752	17,443
8/13/16 8/14/16	0 0	0 0	0 0	0 0	0 0	109,044 96,958	17,443 17,443
8/15/16	0	0	0	0	0	115,444	17,443
8/16/16	0	0	0	0	0	121,417	17,443
8/17/16	0	0	0	0	0	116,285	17,443
8/18/16 8/19/16	0 0	0 0	0 0	0 0	0 0	108,754 103,462	17,443 17,443
8/20/16	8	3	6	7	5	90,642	28,829
8/21/16	4	0	3	0	2	102,420	21,789
8/22/16 8/23/16	0 0	0 0	0 0	0 0	0 0	114,711 124,458	17,443 17,443
8/24/16	0	0	0	0	0	134,269	17,443
8/25/16	7	0	0	5	1	137,157	20,558
8/26/16	2	0	1	2	1	118,876	18,898
8/27/16 8/28/16	5 0	0 0	1 0	0 0	1 0	104,042 124,833	19,301 17,443
8/29/16	0	0	0	0	0	158,567	17,443
8/30/16	4	0	0	0	1	147,238	18,549
8/31/16	3	0	0	0	0	135,047	18,220
9/1/16 9/2/16	6 3	0 0	3 3	1 0	2 2	120,978 113,860	22,059 20,978
9/3/16	1	0	0	0	0	107,434	17,593
9/4/16	0	0	0	0	0	97,344	17,443
9/5/16 9/6/16	0 0	0 0	0 0	0 0	0 0	101,559 138,653	17,443 17,443
9/7/16	2	0	0	0	0	127,110	17,921
9/8/16	2	0	0	0	0	125,226	18,071
9/9/16 9/10/16	4	0	3	5	3	101,279	23,165
9/10/16 9/11/16	8 0	1 0	6 0	3 0	4 0	97,358 94,085	26,132 17,443
9/12/16	5	0	0	6	1	112,136	20,453
9/13/16	17 11	9	8	17	10	112,697	39,578 27.078

111,904

27,978

9/14/16

11

4

3

6

5

9/15/16	3	0	0	3	1	95,472	19,167	
9/16/16	4	0	0	2	1	95,632	18,943	
9/17/16	12	2	5	1	5	94,526	27,371	
9/18/16	2	0	0	0	0	90,576	17,921	
9/19/16	7	0	0	0	1	119,108	19,387	Μ
9/20/16	5	Ő	0 0	0	1	113,338	18,848	IV
9/21/16	4	0	0	0	1	109,618	18,759	
9/22/16	9	0	0	0	1	113,478	20,134	
9/23/16	7	0	1	0	1	108,287	20,479	
9/24/16	6	0	0	0	1	94,908	19,357	
9/25/16	9	8	8	13	9	96,494	35,894	
9/26/16	15	9	10	13	11	123,792	40,304	
9/27/16	19	11	10	10	12	127,224	42,467	
9/28/16	11	12	10	16	11	123,921	41,860	
9/29/16	10	6	7	12	8	128,198	34,206	
							,	
9/30/16	12	4	3	5	5	121,543	27,400	
10/1/16	11	3	6	6	6	129,385	29,474	
10/2/16	9	1	4	1	3	129,498	24,687	
10/3/16	10	0	1	0	2	131,294	21,376	
							-	
10/4/16	2	0	0	10	1	125,955	20,314	
10/5/16	17	10	9	13	11	151,183	40,010	
10/6/16	20	15	15	24	17	145,758	53,002	
10/7/16	28	25	25	26	26	157,338	72,251	
10/8/16	29	22	20	24	22	154,969	64,674	
10/9/16	21	17	15	14	16	143,895	52,046	
10/10/16	2	1	4	7	3	140,791	23,714	
10/11/16	17	8	6	19	10	145,564	37,946	
10/12/16	29	24	30	31	28	175,486	77,755	
10/13/16	23	21	23	21	22	174,460	65,008	
10/14/16	13	11	14	9	13	149,216	44,350	
10/15/16	16	8	7	11	9	140,215	36,976	
							-	
10/16/16	15	6	3	4	6	134,911	29,806	
10/17/16	16	4	5	10	7	167,367	31,687	
10/18/16	13	9	10	13	10	178,397	39,681	
10/19/16	30	19	17	26	21	203,088	61,524	
							-	
10/20/16	26	21	26	26	25	210,708	70,286	
10/21/16	27	20	23	18	22	175,613	64,631	
10/22/16	17	12	12	10	12	153,898	43,842	
10/23/16	28	21	21	23	22	160,729	64,789	
10/24/16	24	19	20	22	20	175,000	60,966	
10/25/16	26	20	24	18	22	179,338	64,991	
10/26/16	28	22	24	22	24	192,371	68,224	
10/27/16	23	20	25	14	22	185,294	64,220	
10/28/16	16	4	8	5	8	149,938	33,489	
10/29/16	23	17	17	23	18	160,032	56,716	
10/30/16	27	22	24	25	24	173,131	68,966	
10/31/16	21	13	14	18	15	169,962	50,281	
11/1/16	24	14	11	16	14	183,410	47,300	
11/2/16	21	13	15	16	16	190,222	50,870	
11/3/16	20	12	16	11	15	198,342	48,489	
11/4/16	16	10	12	8	12	168,867	42,107	
11/5/16	13	6	10	6	9	151,412	36,569	
11/6/16	7	7	13	9	10	147,862	38,986	
11/7/16	17	12	17	19	16	166,101	50,845	
11/8/16	24	19	23	24	22	180,011	63,821	
	16	15				176,530		
11/9/16			18	17	17		53,084	
11/10/16	21	13	17	16	16	171,771	52,096	
11/11/16	30	25	29	29	28	196,137	77,117	
11/12/16	22	20	24	24	22	182,285	65,317	
11/13/16	14	15	17	19	16	164,931	51,955	
11/14/16	23	24	27	23	25	183,955	70,772	
11/15/16	25	21	22	20	22	174,735	64,237	
11/16/16	24	15	18	15	18	164,123	55,257	
11/17/16	26	15	12	30	17	167,660	53,652	
	43	34	29	51				
11/18/16					35	219,713	91,638	
11/19/16	50	42	46	50	46	239,663	115,052	
11/20/16	43	41	42	42	42	251,845	107,157	
11/21/16	42	35	37	38	37	232,672	97,134	
11/22/16	37	34	35	35	35	234,728	92,742	
11/23/16	35	33	34	35	34	218,519	89,826	
11/24/16	33	32	32	37	32	217,703	86,838	
11/25/16	34	35	35	28	34	225,346	89,999	
	32	29	31					
11/26/16				30	30	208,686	82,302	
11/27/16	33	27	29	29	29	200,666	79,357	
11/28/16	27	23	28	35	27	203,478	75,846	
11/29/16	31	31	34	38	33	219,158	88,566	
	34	31	34	39	34		89,260	
11/30/16						218,927		
12/1/16	39	34	36	37	36	233,555	93,706	
12/2/16	40	37	39	40	38	242,710	99,700	
12/3/16	39	37	38	38	38	226,037	98,073	
	36	34		32				
12/4/16			39		37	227,289	95,636	
12/5/16	37	39	42	45	40	229,031	103,978	
12/6/16	53	53	59	64	57	274,909	138,639	
12/7/16	53	55	60	66	58	288,743	141,655	
12/8/16	54	52	59	64	57	310,657	139,263	
12/9/16	63	58	61	60	60	335,218	146,032	
12/10/16	62	57	59	58	59	301,660	143,080	
12/11/16	59	59	58	65	59	301,565	143,855	
12/12/16	70	71	74	66	71	336,250	170,059	_

Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG Attachment 9

12/14/16 73 70 75 70 73 33.4860 172.706 12/14/16 60 72 69 71 375.680 165.704 12/14/16 64 62 61 68 63 330.773 165.304 12/14/16 64 62 61 68 52 227.247 137.640 12/24/16 61 48 63 57 65 227.447 137.640 12/24/16 61 38 41 40 40 24.584 137.662 12/24/16 65 24 47 44 42 24.568 109.284 12/24/16 65 34 39 41 25.777 106.012 12/24/16 57 54 56 56 224.669 109.284 12/24/16 57 44 47 44 48 256.001 116.660 12/24/16 52 45 53 50 50 267.234 112.757 12/24/16 54 44 47 44 48									
124/5/6 80 79 82.89 165.704 124/5/6 64 62 61 68 63 333.773 151.199 124/71/6 64 62 61 68 84 304.09 756.30 M 124/71/6 64 63 33.779 157.193.409 M 107.284 107.884 107.884 107.884 107.884 107.284 107.884 107.874 <	12/13/16	73	70	75	70	73	334 866	172 708	
12/26/16 64 62 61 68 63 337.77 91.99 12/71/16 82 80 85 82 327.217 81.99 91.909 12/21/16 61 63 57 56 222.416 137.662 12/21/16 42 39 45 45 42 242.681 109.282 12/21/16 42 39 44 43 42 24.02.05 109.281 12/221/16 45 34 34 42 24.02.05 109.281 12/221/16 40 41 43 42 24.40.05 107.388 12/221/16 40 41 43 42 24.40.05 107.388 12/221/16 57 54 50 45 27.778 107.388 127.378 12/221/16 52 53 50 50 250.203 112.375 127.41 130.674 149.971 117.478 127.478 112.778 127.478 112.778 127.478 112.778 114.677 114.677 144.677 147.657 1									
12/17/16 62 61 68 63 33.779 151.99 M 12/18/16 78 75 68 85 82 372.217 193.409 12/18/16 75 18 81 40 40 245.681 103.222 12/21/16 41 38 41 40 42 240.081 103.224 12/21/16 40 39 44 43 42 240.081 103.224 12/23/16 40 41 43 42 240.081 109.244 12/23/16 53 44 41 43 42 240.081 109.244 12/23/16 53 44 47 44 46 250.101 101.041 12/20/16 53 44 47 47 46 250.010 12.277 12/20/16 54 44 47 44 46 47 12.47.57 12/20/16 54 55 57 78	12/14/16	80	77	80	78	79	382,958	185,704	
12/17/16 62 61 68 63 33.779 151.99 M 12/18/16 78 75 68 85 82 372.217 193.409 12/18/16 75 18 81 40 40 245.681 103.222 12/21/16 41 38 41 40 42 240.081 103.224 12/21/16 40 39 44 43 42 240.081 103.224 12/23/16 40 41 43 42 240.081 109.244 12/23/16 53 44 41 43 42 240.081 109.244 12/23/16 53 44 47 44 46 250.101 101.041 12/20/16 53 44 47 47 46 250.010 12.277 12/20/16 54 44 47 44 46 47 12.47.57 12/20/16 54 55 57 78	12/15/16	70	69	72	69	71	373.684	168.313	
12/19/16 80 85 89 84 80.000 195.300 M 12/19/16 51 48 63 57 56 222.11/8 137.662 12/20/16 41 38 41 40 40 245.841 108.282 12/21/16 42 39 45 45 42 242.603 107.238 12/21/16 45 34 34 41 38 221.062 89 59.255 12/21/16 57 46 66 45 49 274.643 122.316 12/21/16 57 46 67 44 46 287.237 122.806 12/21/16 57 46 67 49 274.643 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.336 122.335 122.336 122.336 122.346 122.346 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
121916 75 68 65 52 92,217 193,409 122916 41 38 41 40 40 242,668 105,224 122216 40 39 45 42 242,668 105,224 122216 40 39 44 43 42 242,685 106,224 122216 40 41 43 49 42 246,69 107,288 122676 57 46 66 88 56 222,408 107,288 122676 57 46 53 40 41 257,77 105,722 122676 53 44 47 44 46 286,203 112,777 122676 52 53 50 50 22,727 103,174 170,077 122676 52 53 50 50 24,734 112,775 122676 53 45 53 56 56 156,95 116,9							339,779	151,199	
12/19/16 78 75 88 85 82 372.217 193.400 12/29/16 41 38 41 40 40 245.681 103.7662 12/21/16 41 38 41 43 42 242.685 106.224 12/22/16 40 39 44 43 42 242.685 106.224 12/22/16 40 41 43 49 42 242.665 107.398 12/22/16 57 45 50 44 49 42 24.665 107.398 12/22/16 57 45 50 44 47 44 46 256.001 116.600 12/22/16 53 44 47 44 46 256.001 116.600 12/21/16 54 44 47 44 46 267.001 116.600 12/21/17 41 41 43 47.724 112.778 112.778 12/21/16 52 46 73 37.143 144.075 12/21/17 41 44 46 265.001 116.600 12/21/17 41 45 46 36 27.457 147.474 14/17 <td>12/17/16</td> <td>82</td> <td>80</td> <td>85</td> <td>89</td> <td>84</td> <td>360,409</td> <td>196,309</td> <td>Μ</td>	12/17/16	82	80	85	89	84	360,409	196,309	Μ
11219/16 51 48 63 67 66 222,146 103,222 12221716 42 39 45 46 42 242,068 108,224 12221716 40 39 44 43 42 242,068 107,238 1222716 57 54 56 56 26,403 136,215 1222716 57 46 50 45 49 224,668 136,215 1222816 53 44 51 47 49 227,337 122,084 1223916 53 44 51 47 49 227,337 122,084 1230916 53 44 51 47 49 227,337 122,084 1230916 53 44 51 47 49 227,337 122,084 1230916 54 44 53 53 50 50 22,337,341 199,391 17117 41 43 41 53 43 24,7341 199,391 17117 77 75 <	12/18/16	78	75	88	85	82	372 217	103 400	
11220/16 41 38 41 40 424, 341 103,282 12221/6 40 39 44 43 42 242,060 107,238 12221/6 40 39 44 43 42 242,660 107,338 12221/6 40 41 43 49 42 224,661 107,338 12226/16 57 54 66 68 66 224,403 136,215 12226/16 53 44 51 47 49 227,367 152,600 12201/16 54 44 47 44 64 224,403 136,531 170,445 1201/16 52 45 53 60 50 226,778 124,475 12121/16 52 45 53 60 50 224,788 124,475 12121/16 52 77 77 73 33,173 156,777 12121/17 78 66 67 224,58									
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12221716 57 46 50 46 49 227,430 122,836 12281716 53 44 61 47 49 267,237 122,034 12281716 53 44 47 44 46 285,010 116,869 12281716 52 45 53 50 50 282,238 124,475 11/17 41 43 41 53 43 247,341 109,331 11/17 74 43 41 53 43 247,341 109,331 11/17 75 75 76 78 78 361,374 134,957 11/17 75 66 67 70 337,243 179,975 11/117 76 68 69 66 282,827 139,946 11/12/17 76 68 64 66 288,662 136,629 11/12/17 78 68 64 61 282,067 127,401									
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123/1/6 52 45 53 50 50 262.238 124.475 11/17 49 41 45 447.341 109.91 13/37 67 71 338.83 170.447 14/17 85 75 78 78 79 337.143 174.497 11/617 78 71 76 66 73 377.143 174.977 11/617 78 77 66 74 69 72 347.734 170.677 11/617 78 76 66 73 377.143 174.497 11/1017 76 66 67 63 56 283.71 137.462 11/1117 78 65 64 69 66 320.488 175.627 11/1117 72 63 44 51 286.62 136.629 11/16/17 52 48 56 48 56 285.26 11/16/17 74 4	12/30/16	54	44	47	44	46	259.010	116.690	
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11/10/17 61 54 54 63 56 288,371 137,462 11/11/17 78 63 64 69 66 320,488 157,627 11/13/17 76 66 65 63 67 327,130 159,946 11/14/17 59 54 58 48 56 288,652 156229 11/16/17 52 48 56 41 41 4224,697 95,528 11/16/17 34 32 41 42 40 242,459 95,528 11/19/17 34 32 31 33 33 211,290 87,457 12/2/17 31 30 35 36 33 209,273 85,103 1/2/17 33 33 36 36 32 227,675 99,845 1/2/17 33 33 36 36 32 227,125 121,865 1/2/17 48 46 49 <td< td=""><td>1/9/17</td><td>53</td><td>46</td><td>47</td><td>52</td><td>48</td><td>274.677</td><td>120.758</td><td></td></td<>	1/9/17	53	46	47	52	48	274.677	120.758	
11/11/7 72 63 64 69 66 320.485 157.6277 11/13/17 76 66 65 63 67 70 333.973 166.777 11/13/17 76 66 65 63 67 327.130 159.946 11/15/17 52 54 58 48 56 228.622 136.229 11/15/17 34 32 41 41 221.591 102.422 11/16/17 34 32 41 34 37 224.359 95.526 11/19/17 32 31 34 33 32 211.290 67.457 12/2/17 31 30 34 34 32 206.444 86.175 1/2/17 31 30 35 36 35 223.841 91.388 1/2/17 31 30 34 34 242.826 195.755 1/2/2/17 31 34 44 46 260.048 116.799 1/2/2/17 45 52 52 49									
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1/13/17 76 66 65 63 67 327,130 159,649 1/14/17 59 54 58 48 56 286,652 136,629 1/15/17 52 48 56 41 51 282,652 136,629 1/17/17 39 37 41 42 40 242,447 102,422 1/18/17 34 32 41 34 37 224,359 95,526 1/19/17 21 31 30 34 34 32 206,444 86,175 1/20/17 31 30 34 34 32 227,675 99,845 1/22/17 31 30 34 43 29 227,675 99,845 1/26/17 43 41 43 49 43 243,826 199,570 1/26/17 43 46 49 56 49 276,572 121,885 1/26/17 47 45 53 66 64 261,331 16,979 1/26/17 43 46 </td <td>1/12/17</td> <td>78</td> <td></td> <td>60</td> <td></td> <td></td> <td></td> <td></td> <td></td>	1/12/17	78		60					
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/3/17	60	53	60	58	58	305,202	140,765	
2/5/17 57 46 50 48 49 $279,677$ $123,002$ $2/6/17$ 51 41 41 39 42 $257,489$ $107,740$ $2/7/17$ 65 59 54 65 58 $302,300$ $142,231$ $2/8/17$ 71 64 67 62 66 $328,498$ $158,804$ $2/9/17$ 63 56 61 57 59 $300,081$ $144,612$ $2/10/17$ 38 32 40 28 36 $229,113$ $93,689$ $2/11/17$ 40 31 32 34 33 $217,001$ $88,421$ $2/12/17$ 40 35 42 34 38 $232,26$ $99,772$ $2/13/17$ 33 28 37 32 33 $226,315$ $88,639$ $2/14/17$ 48 39 42 39 42 $243,849$ $106,260$ $2/15/17$ 49 40 42 37 41 $251,141$ $106,944$ $2/16/17$ 37 32 36 22 33 $222,754$ $88,733$ $2/17/17$ 27 20 24 19 23 $182,839$ $65,712$ $2/19/17$ 27 27 22 25 $195,159$ $71,642$ $2/20/17$ 27 24 27 22 25 $195,159$ $71,642$ $2/22/17$ 33 23 23 23 24 $199,557$ $68,979$ $2/22/17$		51	11				260 236		
2/6/17 51 41 41 39 42 $257,489$ $107,740$ $2/7/17$ 65 59 54 65 58 $302,300$ $142,231$ $2/8/17$ 71 64 67 62 66 $328,498$ $158,804$ $2/9/17$ 63 56 61 57 59 $300,081$ $144,612$ $2/10/17$ 38 32 40 28 36 $229,113$ $93,689$ $2/11/17$ 40 31 32 34 33 $217,001$ $88,421$ $2/12/17$ 40 35 42 34 38 $229,215$ $88,639$ $2/14/17$ 48 39 42 39 42 $243,849$ $106,260$ $2/15/17$ 49 40 42 37 41 $251,141$ $106,094$ $2/16/17$ 37 32 36 22 33 $226,515$ $88,733$ $2/16/17$ 27 20 24 19 23 $182,839$ $65,712$ $2/18/17$ 27 20 24 19 23 $182,839$ $65,712$ $2/19/17$ 27 17 21 16 20 $171,856$ $59,895$ $2/20/17$ 27 14 27 22 25 $195,157$ $71,642$ $2/21/17$ 23 23 23 23 24 $199,557$ $68,979$ $2/23/17$ 46 39 39 49 41 $248,770$ $105,017$ <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>									
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/5/17	57	46	50	48	49	279,677	123,002	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/6/17	51	41	41	39	42	257,489	107.740	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/7/17		59	54	65	58	302,300	142,231	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/8/17	71	64	67	62	66	328,498	158,804	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/9/17	63	56	61	57		300 081	144 612	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/10/17	38	32	40	28	36	229,113	93,689	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/11/17	40	31	32	34	33	217.001	88.421	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/13/17	33	28	37	32	33	226,315	88,639	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/14/17	48	39	42	39	42	243 849	106.260	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/15/17				37	41	251,141	106,094	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/16/17	37	32	36	22	33	222,754	88,733	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		24	18				18/ /13		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/18/17	27	20	24	19	23	182,839	65,712	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/19/17	27	17	21	16	20	171.856	59.895	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/20/17								
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2/21/17	24	19	22	16	21	184,610	61,712	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/24/17	57	53	56	58	55	285,199	135,813	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2/26/17	55	37	49	42	45	258,707	114,600	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
3/1/17 49 43 50 43 47 270,425 118,374 3/2/17 66 47 53 48 53 304,960 130,133 3/3/17 53 46 52 45 50 272,707 123,552 3/4/17 39 35 41 34 38 227,605 98,692 3/5/17 25 15 25 14 21 191,123 61,641 3/6/17 33 21 22 21 23 192,953 67,049 3/7/17 52 38 35 35 38 235,468 99,448 3/8/17 58 42 41 39 43 265,340 110,030 3/9/17 64 54 52 58 55 296,833 134,533 3/10/17 66 57 57 59 58 334,351 142,083									
3/2/17 66 47 53 48 53 304,960 130,133 3/3/17 53 46 52 45 50 272,707 123,552 3/4/17 39 35 41 34 38 227,605 98,692 3/5/17 25 15 25 14 21 191,123 61,641 3/6/17 33 21 22 21 23 192,953 67,049 3/7/17 52 38 35 35 38 235,468 99,448 3/8/17 58 42 41 39 43 266,340 110,030 3/9/17 64 54 52 58 55 296,833 134,533 3/10/17 66 57 57 59 58 334,351 142,083	2/28/17						236,467	95,174	
3/2/17 66 47 53 48 53 304,960 130,133 3/3/17 53 46 52 45 50 272,707 123,552 3/4/17 39 35 41 34 38 227,605 98,692 3/5/17 25 15 25 14 21 191,123 61,641 3/6/17 33 21 22 21 23 192,953 67,049 3/7/17 52 38 35 35 38 235,468 99,448 3/8/17 58 42 41 39 43 266,340 110,030 3/9/17 64 54 52 58 55 296,833 134,533 3/10/17 66 57 57 59 58 334,351 142,083	3/1/17	49	43	50	43	47	270,425	118,374	
3/3/175346524550272,707123,5523/4/173935413438227,60598,6923/5/172515251421191,12361,6413/6/173321222123192,95367,0493/7/175238353538235,46899,4483/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083									
3/4/173935413438227,60598,6923/5/172515251421191,12361,6413/6/173321222123192,95367,0493/7/175238353538235,46899,4483/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083									
3/4/173935413438227,60598,6923/5/172515251421191,12361,6413/6/173321222123192,95367,0493/7/175238353538235,46899,4483/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083	3/3/17	53	46	52	45	50	272,707	123,552	
3/5/172515251421191,12361,6413/6/173321222123192,95367,0493/7/175238353538235,46899,4483/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083									
3/6/173321222123192,95367,0493/7/175238353538235,46899,4483/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083									
3/7/175238353538235,46899,4483/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083	3/5/17				14	21	191,123	61,641	
3/7/175238353538235,46899,4483/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083	3/6/17	33	21	22	21	23	192.953	67.049	
3/8/175842413943265,340110,0303/9/176454525855296,833134,5333/10/176657575958334,351142,083									
3/9/17 64 54 52 58 55 296,833 134,533 3/10/17 66 57 57 59 58 334,351 142,083									
3/9/17 64 54 52 58 55 296,833 134,533 3/10/17 66 57 57 59 58 334,351 142,083	3/8/17	58	42	41	39	43	265,340	110,030	
3/10/17 66 57 57 59 58 334,351 142,083									
	3/10/17	66	57	57	59	58	334,351	142,083	
	3/11/17	58	54	53	55	54		132,907	
							, •	. ,	

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Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG Attachment 9

3/12/17	55	52	51	58	53	295,291	130,229	
3/13/17	57	51	57	63	56	317,540	137,169	
3/14/17	52	47	56	56	53	306,564	130,657	
							-	
3/15/17	41	45	51	52	48	275,983	119,700	
3/16/17	36	37	44	34	40	230,838	102,599	Ν
3/17/17	38	33	35	36	35	227,775		
							92,331	
3/18/17	37	31	36	30	34	231,427	90,172	
3/19/17	30	23	27	16	25	201,700	70,727	
3/20/17	33	26	24	29	27	218,433	74,221	
3/21/17	49	39	41	41	42	269,330	106,770	
3/22/17	41	37	41	38	40	233,366	102,211	
						,		
3/23/17	33	30	32	29	31	225,923	84,206	
3/24/17	32	27	31	32	30	213,289	81,984	
						,		
3/25/17	35	28	33	32	32	217,906	85,580	
3/26/17	32	26	29	29	29	227,909	78,820	
3/27/17	27	18	27					
				25	24	238,211	69,283	
3/28/17	19	12	18	18	17	202,283	53,203	
3/29/17	34	23	29	28	28	212,228	76,322	
3/30/17	31	28	32	31	30	224,663	82,011	
3/31/17	23	20	24	24	23	215,256	66,471	
4/1/17	21	12	17	16	16	176,176	51,398	
4/2/17	21	15	21	17	19	189,568	57,473	
4/3/17	22	19	22	21	21	201,340	62,466	
4/4/17	22	15	18	20	18	189,286	55,722	
4/5/17	27	21	26	27	25	213,172	70,720	
4/6/17	30	22	28	26	26	202,723	73,601	
4/7/17	19	16	18	14	17	180,241	54,456	
4/8/17	15	5	6	3	7	157,204	32,017	
							-	
4/9/17	19	7	8	17	10	160,268	39,467	
4/10/17	34	29	28	36	30	226,894	81,551	
	28	23				226,771		
4/11/17			26	21	25		70,296	
4/12/17	17	16	17	18	17	197,384	53,394	
4/13/17	19	16	17	18	17	178,338	53,600	
4/14/17	16	8	11	7	10	158,406	39,894	
4/15/17	13	6	10	12	9	151,602	37,247	
		11	12					
4/16/17	25			13	13	164,762	46,252	
4/17/17	31	13	13	14	16	190,517	50,842	
4/18/17	29	11	13	13	15	192,190	48,757	
							-	
4/19/17	30	22	22	25	23	216,157	67,170	
4/20/17	32	23	29	27	27	208,955	75,846	
							-	
4/21/17	18	14	17	19	16	182,615	52,048	
4/22/17	17	6	12	10	11	156,442	40,723	
4/23/17	35	6	8	6	11	161,998	40,381	
4/24/17	28	2	5	16	9	151,105	35,787	
4/25/17	24	20	10	33	18	183,696	55,160	
4/26/17	39	31	31		33			
				38		215,391	87,488	
4/27/17	42	33	37	34	36	252,464	94,488	
4/28/17	30	22	27	28	26	210,704	73,007	
4/29/17	24	19	24	26	23	187,498	66,769	
4/30/17	28	26	30	37	29	209,696	79,901	
5/1/17	33	30	30	32	31	241,418	83,205	
5/2/17	18	12	21	14	17	210,879	54,563	
5/3/17	11	11	14	17	13	194,248	45,574	
							-	
5/4/17	17	7	10	11	10	173,639	39,724	
5/5/17	14	5	7	7	7	155,534	32,800	
5/6/17	25	7	12	6	12	157,963	42,147	
5/7/17	22	9	12	0	11	157,401	41,383	
5/8/17	20	5	7	0	7	168,829	32,773	
5/9/17	10	3	3	7	5	159,263	27,203	
5/10/17	14	8	11	14	11	164,609	40,916	
5/11/17	17	9	13	13	12	168,511	43,419	
5/12/17	11	0	1	0	2	155,737	21,215	
5/13/17	12	0	0	0	2	137,320	21,091	
5/14/17	18	0		0	2			
			0			143,267	22,766	
5/15/17	16	0	0	0	2	142,168	22,198	
5/16/17	15	0	0	0	2	139,069	22,048	
5/17/17	16	6	6	9	8	137,063	34,176	
5/18/17	23	17	21	20	20	158,477	60,022	
	22	17						
5/19/17			24	26	22	166,236	64,013	
5/20/17	27	20	23	27	23	164,141	66,879	
5/21/17	22	19	24	20	22	175,587	63,656	
5/22/17	16	8	8	10	9	159,277	37,249	
5/23/17	16	13	18	18	16	163,269	51,669	
5/24/17	18	10	13	14	13	156,335	44,925	
5/25/17	12	1	5	3	4	146,454	26,864	
5/26/17	8	0	3	4	3	153,256	23,484	
5/27/17	3	1	4	6	3	132,197	24,211	
5/28/17	9	1	5	5	5	133,295	27,146	
	16	7	11	12				
5/29/17					10	144,950	39,709	
5/30/17	18	11	13	13	13	155,479	44,990	
5/31/17	14	3	4	6	5	149,145	28,653	
6/1/17	4	0	0	0	1	140,085	18,520	
6/2/17	2	0	0	0	0	148,479	17,921	
6/3/17	0	0	0	0	0	144,740	17,443	
6/4/17	1	0	0	0	0	139,494	17,593	
6/5/17	11	0	0	0	2	141,945	20,732	
6/6/17	6	0	0	0	1	136,644	19,297	
6/7/17	0	0	0	0	0	142,843	17,443	
6/8/17	2	0	0	0	0	151,905	17,921	

Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG Attachment 9

6/9/17 3 0 0 0 0 $6/10/17$ 0 0 0 0 0 $6/10/17$ 0 0 0 0 0 $6/11/17$ 4 0 0 0 0 $6/12/17$ 0 0 0 0 0 $6/13/17$ 11 0 0 0 1 $6/14/17$ 8 0 0 0 0 $6/16/17$ 0 0 0 0 0 $6/17/17$ 0 0 0 0 0 $6/18/17$ 5 0 2 3 2 $6/20/17$ 8 0 1 0 2 $6/21/17$ 1 0 1 0 0 $6/22/17$ 1 0 1 0 0 $6/22/17$ 1 0 1 0 0 0 $6/26/17$ 8 2 </th <th></th> <th></th>		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$) 141,382 18,250	
6/12/17 0 0 0 0 0 $6/13/17$ 11 0 0 0 1 $6/13/17$ 11 0 0 0 1 $6/14/17$ 8 0 0 0 1 $6/15/17$ 1 0 0 0 0 $6/16/17$ 0 0 0 0 0 $6/16/17$ 0 0 0 0 0 $6/18/17$ 5 0 2 3 2 $6/19/17$ 11 0 2 0 2 $6/20/17$ 8 0 1 0 0 $6/21/17$ 1 0 1 0 0 $6/21/17$ 7 1 6 11 5 $6/24/17$ 9 6 10 9 9 $6/25/17$ 14 6 10 8 9 $6/26/17$ 8 2 8 7 6 $6/28/17$ 8 0 0) 123,115 17,443	
6/13/17 11 0 0 0 1 $6/13/17$ 11 0 0 0 1 $6/15/17$ 1 0 0 0 1 $6/15/17$ 1 0 0 0 0 $6/16/17$ 0 0 0 0 0 $6/16/17$ 0 0 0 0 0 $6/17/17$ 0 0 2 3 2 $6/19/17$ 11 0 2 0 2 $6/20/17$ 8 0 1 0 2 $6/21/17$ 3 0 0 0 0 $6/21/17$ 7 1 6 11 5 $6/24/17$ 9 6 10 9 9 $6/25/17$ 14 6 10 8 9 $6/26/17$ 8 2 8 7 6 $6/28/17$ 8 0 0 0 1 $6/29/17$ 5 0 0	136,630 18,520	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$) 155,388 17,443	
6/15/17 1 0 0 0 0 $6/15/17$ 1 0 0 0 0 0 $6/16/17$ 0 0 0 0 0 0 $6/17/17$ 0 0 0 0 0 0 $6/18/17$ 5 0 2 3 2 $6/19/17$ 11 0 2 0 2 $6/20/17$ 8 0 1 0 2 $6/21/17$ 3 0 0 0 0 $6/22/17$ 1 0 1 0 0 $6/23/17$ 7 1 6 11 5 $6/26/17$ 8 2 8 7 6 $6/26/17$ 8 2 8 7 6 $6/28/17$ 8 0 0 0 0 $6/28/17$ 8 0 0 1 1 $6/29/17$ 5 0 0 1 1 $6/30/17$ 2	145,683 20,613	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	156,104 19,925	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$) 155,694 17,593	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$) 152,134 17,443	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$) 125,647 17,443	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	2 130,630 21,248	
	2 137,406 22,284	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2 149,785 20,868	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$) 136,017 18,220	
6/24/17 9 6 10 9 9 6/25/17 14 6 10 8 9 6/26/17 8 2 8 7 6 6/26/17 8 2 8 7 6 6/27/17 2 0 0 0 0 6/28/17 8 0 0 0 1 6/29/17 5 0 0 0 1 6/30/17 2 0 0 2 0	0 142,105 18,075	
6/25/17 14 6 10 8 9 6/26/17 8 2 8 7 6 6/27/17 2 0 0 0 0 6/28/17 8 0 0 0 1 6/29/17 5 0 0 0 1 6/30/17 2 0 0 2 0	5 139,479 28,300	
6/26/17 8 2 8 7 6 6/27/17 2 0 0 0 0 6/28/17 8 0 0 0 1 6/29/17 5 0 0 0 1 6/30/17 2 0 0 2 0	9 137,320 35,654	
6/27/17200006/28/17800016/29/17500016/30/1720020	9 136,451 36,620	
6/28/17 8 0 0 0 1 6/29/17 5 0 0 0 1 6/30/17 2 0 0 2 0	6 150,841 30,228	
6/29/17 5 0 0 0 1 6/30/17 2 0 0 2 0) 136,929 17,921	
6/30/17 2 0 0 2 0	138,237 19,686	
	135,881 18,848	
Tetele 0.000 7.407 7.040 7.045 7) 131,639 18,290	
Totals 8,980 7,127 7,918 7,915 7,	7,835 69,179,284 23,126,133	

* Volumes include interruptible and transportation volumes

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

Minnesota Energy Resources Corporation 2017-2018 Demand Entilement MERC-NNG

> Attachment 10 NNG

MINNESOTA ENERGY RESOURCES - NNG

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

Tariff		Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Annual
Rate	Rate	Average												
Class	Designation	Customers												
GS- Residential	MERC000001	169,238	169,904	170,514	169,770	170,562	170,112	171,193	170,326	170,589	170,973	171,673	172,370	170,602
GS-C&I <1,500 therms/yr (Small)	MERC000005	6,268	6,809	6,576	6,550	6,611	6,611	6,643	6,596	6,608	6,569	6,569	6,674	6,590
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	9,694	10,294	10,067	9,905	9,946	9,916	10,072	9,953	10,009	10,003	10,042	10,019	9,993
GS-C&I >1,500 therms/yr (Large) Emmons, IA	MERC000014	3	3	3	4	3	3	3	3	2	2	2	2	3
Small Volume Interruptible (SVI)	MERC000015	271	412	249	352	296	305	295	260	329	285	282	289	302
Small Volume Interruptible w/Joint (SVJ)	MERC000019	2	6	3	5	6	2	5	3	3	3	3	3	4
Large Volume Interruptible (LVI)	MERC000022	42	88	39	74	62	66	62	53	68	59	57	58	61
Large Volume Interruptible w/Joint (LVJ)	MERC000026	2	0	0	1	1	1	1	1	1	1	2	2	1
Total		185,521	187,517	187,452	186,662	187,488	187,017	188,275	187,196	187,610	187,896	188,631	189,418	187,557

Futures Contracts WACOG

MINNESOTA ENERGY RESOURCES - NNG Projected Fixed Cost - November 2017 through March 2018

Futures	10,000	0 Dth/contra	act			30						31							31															rces Corporation	
Deal	Purchase	se Trade	Number	Physical	Strike	Strike	Nov-		Over/(Under)	Premium Pre	ium Total	Deal	Purchase	Trade	Number	Physical		Dec-17 Strike	LDS LC	DS Settle C	Over/(Under)	Premium Prer	nium Total	Deal	Purchase	Trade N	Number	Physical	Strike	Jan-18 Strike			BALL ROAD	Previd Fritikement	Total
Number		Number	Contracts	Volume	Price	Cost	Settle*	Cost	Over/(Under) Market	Per Unit C	st Cost	Number	Date		Contracts	Volume	Price	Cost 5	Settle*	Cost		Per Unit Cr	ost Cost	Number	Date	Number C	Contracts	Volume	Price	Cost	Settle*	Cost	Market	PerUMERCENNIG	Cost
1 2 3 4 5 6 7 8 9 10 11 12 13	05/15/17 06/07/17 07/11/17 08/01/17 09/05/17 10/03/17	7 50816 7 52115 7 53035 7 54467	7 5 5 5 5 5	50,000 50,000 50,000 50,000	\$ 3.1410 \$ 3.1320 \$ 2.9000 \$ 3.0500 \$ 2.8970	\$ 244,510 \$ 157,050 \$ 156,600 \$ 145,000 \$ 152,500 \$ 144,850 \$ -	\$ 2.8540 \$ 2.8540 \$ 2.8540 \$ 2.8540 \$ 2.8540 \$ 2.8540	\$ 142,700 \$ 142,700 \$ 142,700 \$ 142,700	\$ 13,900 \$ 2,300 \$ 9,800 \$ 2,150	****	- \$ 157,050 - \$ 156,600 - \$ 145,000 - \$ 152,500 - \$ 144,850	1 3 4 5 6 7 8 9 10 11 12 13	05/25/17 06/21/17 07/21/17 08/24/17 09/19/17 10/17/17	50414 51426 52599 53972 55041 56048	10 10 7 7 7 7	100,000 70,000 70,000 70,000	\$3.1630 \$ \$3.2220 \$ \$3.1910 \$	233,590 \$ 221,340 \$	3.0650 \$ 3.0650 \$ 3.0650 \$ 3.0650 \$ 3.0650 \$ 3.0650 \$ 3.0650 \$	306,500 \$ 214,550 \$ 214,550 \$ 214,550 \$ 214,550 \$	\$ 8,820 \$ 19,040 \$ 6,790		- \$ 316,300 - \$ 225,540 - \$ 223,370	3 4 5	05/22/17 06/19/17 07/18/17 08/21/17 09/14/17 10/18/17	51295 52342 53755 54871	11 11 9 8 8	90,000 80,000	\$3.2370 \$3.4030 \$3.2790 \$3.3510 \$	\$ 295,110	N888NN N888NN N888NN	\$ 351,340 \$ 319,400 \$ 287,460 \$ 255,520		\$ \$ \$ - \$ - \$ -	\$ 406,010 \$ 356,070 \$ 340,300 \$ 295,110 \$ 268,080 \$ 256,080
14 15 Total			32	320,000		\$1,000,510		\$ 913,280	\$ 87,230	s		14 15 // Total			48	480,000		1,570,340			\$ 99,140	s		14 15	Total		57	570,000		\$ 1,921,650			\$ 101,070		\$ 1,921,650
						\$ 3.1266		\$ 2.8540	\$ 0.2726	Ś	- \$ 3.1266						ŝ	3.2715	s	3.0650	\$ 0.2065	ŝ	- \$ 3.2715					,	s	\$ 3.3713	:	\$ 3.1940	\$ 0.1773	\$ -	\$ 3.3713
NNG Other-Cor	26 ins 6	81.25% 18.75%	26 6						\$ 70,874 \$ 16,356				40 8	83.33% 16.67%	40 8			1,308,617 \$ 261,723 \$			\$ 82,617 \$ 16,523					82.46% 17.54%	47 10			\$ 1,584,518 \$ 337,132				s - s - s - s -	
Total	32	100.0%	32	320,000	\$ 3.1266	\$1,000,510	\$ 2.8540	\$ 913,280	\$ 87,230	s - s	- """	Total	48	100.0%	48	480,000	\$ 3.2715 \$	1,570,340 \$	3.0650 #		\$ 99,140	s - s	- =	Total	57	100.0%	57	570,000	\$3.3713 \$	\$ 1,921,650	****	ททธธธททท	\$ 101,070	s - s -	\$ 1,921,650
Deal							Feb											Mar-18						1						Total					
Number				Physical Volume		Strike	LDS	LDS Settle	Over/(Under) Market	Premium Pre Per Unit C	ium Total st Cost	Deal	Purchase Date	Trade	Number Contracts	Financial Volume	Strike	Strike	LDS LD	DS Settle C	Over/(Under) Market	Premium Prer	nium Total	Deal	Purchase			Physical Volume	Strike	Total Strike Cost	LDS Settle	LDS Settle	Over/(Under) Market	Premium Premiun Per Unit Cost	
Number 1 2 3 4 5 6 7 7 8 9 10 11 12 13 14 15		Number 49891 50852 52186 53248 53248 54612	Number Contracts 10 9 8 7 7 7	Volume 100,000 100,000 90,000 70,000 70,000 -	Price \$ 3.5490 \$ 3.3440 \$ 3.3040 \$ 3.1580 \$ 3.1580 \$ 3.2560 \$ 3.2560	Cost \$ 354,900 \$ 297,360 \$ 252,640 \$ 252,640 \$ 227,920 \$	LDS Settle* \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030	LDS Settle Cost \$ 320,300 \$ 320,300 \$ 288,270 \$ 256,240 \$ 224,210	Market \$ 34,600 \$ 14,100 \$ 9,090 \$ (3,600) \$ 8,540 \$ 3,710 \$	Premium Prec C \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	st Cost - \$ 354,900 - \$ 334,400 - \$ 297,360 - \$ 252,640 - \$ 232,750 - \$ 227,920 - \$	Number 1 2 3 4 5	Purchase Date 05/19/17 06/14/17 07/17/17 07/17/17 08/10/17 09/12/17 10/12/17	Trade Number 50037 51117 52310 52311 53394 54768 55962	Number Contracts 9 7 3 3 6 6 6 6 6	Volume 90,000 1 70,000 1 30,000 1 60,000 1 60,000 1 60,000 1 -	Strike Price \$3.5110 \$ \$3.1960 \$ \$3.2720 \$ \$3.2730 \$ \$3.1960 \$ \$3.1960 \$ \$3.1900 \$ \$3.302 \$ \$ \$	Strike Strike 205,990 \$ 315,990 \$ 223,720 \$ 98,160 \$ 191,760 \$ 191,760 \$ 191,810 \$ 191,600 \$ - \$	LDS LD Settle* LC 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$	Cost 284,760 \$ 221,480 \$ 94,920 \$ 94,920 \$ 189,840 \$ 189,840 \$ 189,840 \$	Market \$ 31,230 \$ 2,240 \$ 3,240 \$ 3,270 \$ 1,920 \$ 9,970 \$ 1,560	Per Unit Ci S S S S S S S S S S	- \$ 315,990 - \$ 223,720 - \$ 98,160 - \$ 98,190 - \$ 191,760	Number 1 2 3 4 5 6	Purchase Date	% C	2011racts 47 43 34 32 33 33 6 0	Volume 470,000 430,000 340,000 320,000 330,000 330,000 60,000	Price \$3.5566 \$ \$3.2268 \$ \$3.2881 \$ \$3.2687 \$ \$3.268 \$ \$	Cost \$ 1,671,610 \$ 1,387,540 \$ 1,117,960 \$ 1,014,310 \$ 1,078,680 \$ 1,050,000 \$ 1,050,000 \$ 191,400	Settle ####### ####### ###### ###### ###### \$	Cost ######### ######### ######### ########	Market \$ 208,930 \$ 45,220 \$ 58,120 \$ 58,120 \$ 18,440 \$ 51,860 \$ 23,180 \$ 1,560 \$	Per Unit Cost \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	Cost \$ 1,671,610 \$ 1,387,540 \$ 1,017,960 \$ 1,014,310 \$ 1,078,680 \$ 1,058,000 \$ 191,400 \$
Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Total	r Date 05/17/17 06/08/17 07/12/17 08/07/17 09/07/17 10/05/17	Number 49891 50852 52186 53248 53248 54612	Contracts 10	Volume 100,000 100,000 90,000 80,000 70,000 70,000	Price \$ 3.5490 \$ 3.3440 \$ 3.3040 \$ 3.1580 \$ 3.1580 \$ 3.2560 \$ 3.2560	Cost \$ 354,900 \$ 334,400 \$ 297,360 \$ 252,640 \$ 232,750 \$ 227,920 \$	LDS Settle* \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030 \$ 3.2030	LDS Settle Cost \$ 320,300 \$ 288,270 \$ 256,240 \$ 224,210 \$ 224,210 \$ 2 \$ -	Market \$ 34,600 \$ 14,100 \$ 9,090 \$ (3,600) \$ 8,540 \$ 3,710 \$	Per Unit C \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	st Cost - \$ 354,900 - \$ 334,400 - \$ 297,360 - \$ 252,640 - \$ 222,750 - \$ 222,750 - \$ - - \$ - - \$ -	Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Date 05/19/17 06/14/17 07/17/17 07/17/17 08/10/17 09/12/17	Number 50037 51117 52310 52311 53394 54768	Number Contracts 9 7 3 3 6 6 6 6 6	Volume 90,000 5 70,000 5 30,000 5 60,000 5 60,000 5	Strike Price Strike \$3.5110 \$ \$3.1960 \$ \$3.2720 \$ \$3.2730 \$ \$3.1960 \$ \$3.1960 \$ \$3.1960 \$ \$3.1960 \$ \$3.1900 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Strike Strike Cost 5 315,990 \$ 223,720 \$ 98,160 \$ 98,190 \$ 191,760 \$ 191,400 \$	3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$ 3.1640 \$	Cost 284,760 \$ 221,480 \$ 94,920 \$ 189,840 \$ 180,840 \$ 180,84	Market \$ 31,230 \$ 2,240 \$ 3,240 \$ 3,270 \$ 1,920 \$ 9,970 \$ 1,560	Per Unit CA S S S S S S S S S S S S S S S S S S S	set Cost - \$ 315,990 - \$ 98,160 - \$ 98,160 - \$ 98,191 - \$ 191,760 - \$ 199,810 - \$ 199,810 - \$ 191,400 - \$ -	Number 1 2 3 4 5 6 7 8 9 10 11 12 8 9 10 11 12 13 14 15 14 15 15 10 10 10 10 10 10 10 10 10 10	Purchase Date	% C	2011racts 47 43 34 32 33 33 6 0	Volume 470,000 430,000 340,000 320,000 330,000 330,000 60,000	Price \$3.5566 \$ \$3.2268 \$ \$3.2881 \$ \$3.2887 \$ \$3.2687 \$ \$3.31697 \$ \$3.2687 \$ \$3.31818 \$ \$3.1900 \$ \$ - \$	Cost \$ 1,671,610 \$ 1,387,540 \$ 1,117,960 \$ 1,014,310 \$ 1,078,680 \$ 1,050,000 \$ 191,400	Settle ####### ####### ####### ####### ######	Cost ######### ######### ######### ########	Market \$ 208,930 \$ 45,220 \$ 58,120 \$ 58,120 \$ 51,860 \$ 51,860 \$ 23,180 \$ 1,560 \$ - \$ 407,310	Per Unit Cost \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	Cost \$ 1,671,610 \$ 1,387,540 \$ 1,117,960 \$ 1,014,310 \$ 1,078,680 \$ 1,050,000 \$ 191,400
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	r Date 05/17/17 06/08/17 07/12/17 08/07/17 09/07/17 10/05/17 10/05/17	Number 49891 50852 52186 53248 53248 54612	Contracts 10 10 9 8 7 7 7	Volume 100,000 90,000 80,000 70,000 70,000 510,000 420,000	Price \$ 3.5490 \$ 3.3440 \$ 3.3400 \$ 3.3400 \$ 3.3400 \$ 3.3400 \$ 3.32560 \$ 3.2560 \$ 3.3333	Cost \$ 354,900 \$ 297,860 \$ 252,640 \$ 232,750 \$ 227,920 \$ 227,920 \$ 227,920 \$ 232,750 \$ 227,920 \$ 3,3333 \$ 1,399,975	LDS Settle* \$ 3.2030 \$ 3.2030	LDS Settle Cost \$ 320,300 \$ 288,270 \$ 256,240 \$ 224,210 \$ 24,210 \$ 2 \$ 3,2030 \$ 28,270 \$ 2,224,210 \$ 2,224,210\$ \$ 2,224,210\$ \$ 2,224,21	Market \$ 34,600 \$ 14,100 \$ 9,090 \$ 9,090 \$ (3,600) \$ 8,540 \$ 3,710 \$ - \$ - \$ \$ - \$ \$ 66,440	Per Unit C \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	st Cost - \$ 354,900 - \$ 334,400 - \$ 297,360 - \$ 222,750 - \$ - - \$ - - \$ - - \$ -	Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 7 Total	Date 05/19/17 06/14/17 07/17/17 07/17/17 08/10/17 10/12/17 10/12/17	Number 50037 51117 52310 52311 53394 54768	Contracts 9 7 3 3 6 6 6 6	Volume 90,000 1 30,000 1 30,000 1 60,000 1 60,000 1 60,000 1 400,000 3 330,000 1	Strike Price \$3.5110 \$ \$3.1960 \$ \$3.2720 \$ \$3.2720 \$ \$3.3960 \$ \$3.3302 \$ \$3.3900 \$ \$3.31900 \$ \$3.31900 \$ \$3.2730 \$	Strike <u>Cost</u> <u>\$</u> 315,990 \$ 223,720 \$ 98,160 \$ 98,160 \$ 191,760 \$ 199,810 \$ 199,810 \$ 199,810 \$ 199,400 \$ 191,400 \$ 1,319,030 3.2976 \$ 1,088,200 \$	settle* 3.1640 \$ 3.1640 \$ 3.1640\$	Cost 284,760 \$ 221,480 \$ 94,920 \$ 189,840 \$ 189,840 \$ 189,840 \$ 3,1640 \$ 40,000 \$ 189,840 \$ 180,840 \$ 180,840\$	Market \$ 31,230 \$ 3,240 \$ 3,240 \$ 3,240 \$ 1,920 \$ 1,920 \$ 9,970 \$ 1,560 \$ 1	Per Unit CA S S S S S S S S S S S S S S S S S S S	- ########	Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Total NNG	Date	% C	2011racts 47 43 34 32 33 33 6 0 0 228	Volume 470,000 430,000 340,000 330,000 330,000 60,000 *********************************	Price \$3.5566 \$ \$3.2268 \$ \$3.268 \$ \$3.2881 \$ \$3.1697 \$ \$3.2881 \$ \$3.2687 \$ \$3.3687 \$ \$3.3687 \$ \$3.3687 \$ \$3.2687 \$ \$ \$3.2687 \$ \$ \$3.2687 \$ \$ \$3.2687 \$ \$ \$ \$3.2687 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Cost \$ 1,671,610 \$ 1,137,540 \$ 1,117,960 \$ 1,014,310 \$ 1,078,680 \$ 1,050,000 \$ 191,400 \$ - \$ 7,511,500	Settle ####### ####### ####### ####### \$ *#######	Cost ######### ######### \$ 995,870 ######### \$ 159,840 \$ \$ 	Market \$ 208,930 \$ 45,220 \$ 58,120 \$ 58,120 \$ 51,860 \$ 51,860 \$ 1,560 \$ 1,560 \$ 0,1766 \$ 335,852	Per Unit Cost \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -	Cost \$ 1,671,610 \$ 1,387,540 \$ 1,117,560 \$ 1,017,380 \$ 1,050,000 \$ 191,400 \$ 3,2545 \$ 6,193,693

*Prices from 10/18/17 NYMEX market

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MINNESOTA ENERGY RESOURCES - NNG

Projected Storage Cost - November 2017 through March 2018

						Project	ed Storage Co	st - November 2	017 through M	arch 2018			Minnesota Energy Resources Corporation
Month/ Year	K#118657 NNG Storage (Dth)	LS Power K#132024 NNG Storage (Dth)	LS Power K#132112 NNG Storage (Dth)	Total NNG Storage (Dth)	Projected NNG WACOG	K#118657 NNG Storage Cost	K#132024 NNG Storage Cost	K#132112 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	2017-2018 Demand Entilement MERC-NNG
Nov-17 Dec-17 Jan-18 Feb-18 Mar-18 Total	489,384 1,229,734 1,229,734 1,229,734 489,384 4,667,969	48,750 122,500 122,500 122,500 48,750 465,000	245,000 245,000 245,000 97,500	635,634 1,597,234 1,597,234 1,597,234 635,634 6,062,969	\$ 2.6781 \$ 2.6781 \$ 2.6781 \$ 2.6781 \$ 2.6781	 \$ 3,293,398 \$ 3,293,398 \$ 3,293,398 \$ 1,310,638 	\$ 328,072\$ 328,072\$ 328,072	\$ 656,144 \$ 656,144 \$ 656,144 \$ 261,119					
Month/ Year Nov-17 Dec-17 Jan-18 Feb-18 Mar-18	NNG Storage Volume (Dth) 635,634 1,597,234 1,597,234 635,634	\$ 2.8170 \$ 3.0785 \$ 3.4065 \$ 3.3700	\$ 4,917,084		Month/ Year Nov-17 Dec-17 Jan-18 Feb-18 Mar-18	AECO Storage Volume (Dth)	Total AECO Market WACOG	Total AECO Market Cost \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ -					

Nov-17	635,634	\$ 2.8170	\$ 1,790,580	Nov-17	0	
Dec-17	1,597,234	\$ 3.0785	\$ 4,917,084	Dec-17	0	
Jan-18	1,597,234	\$ 3.4065	\$ 5,440,976	Jan-18	0	
Feb-18	1,597,234	\$ 3.3700	\$ 5,382,677	Feb-18	0	
Mar-18	635,634	\$ 3.0290	\$ 1,925,335	Mar-18	0	
Total	6,062,969	\$ 3.2091	\$ 19,456,653	Total	0	
			\$ 3,219,180			

Max NNG-MERC Storage (Storage plan withdrawals through Apr 18) 6,062,969 Max AECO Storage (Storage plan withdrawals through Apr 18) -

6,519,321 947,820 \$

06/30/17Storage Balance - NNG-MERC 06/30/17 Storage Balance - AECO

19.36% 1,173,536 0.00% 0

1,261,867

0

	1	LS Power	LS Power		Projected	Projected	Projected		Projected	Projected	Projected
	K#118657	K#132024	K#132112	Total	K#118657	K#132024	K#132112	WACOG	NNG	NNG	Storage
Month/	NNG	NNG	NNG	NNG	NNG	NNG	NNG	NNG	Indexes	Index	(Savings)/
Year	Storage (Dth)	Storage (Dth)	Storage (Dth)	Storage (Dth)	WACOG	WACOG	WACOG	Cost	Price	Cost	Cost
Nov-17	489,384	48,750	97,500	635,634	\$ 2.6781	\$ 2.6781	\$ 2.6781	\$ 1,702,316	\$ 2.8170	\$ 1,790,580	\$ (88,265)
Dec-17	1,229,734	122,500	245,000	1,597,234	\$ 2.6781	\$ 2.6781	\$ 2.6781	\$ 4,277,614	\$ 3.0785	\$ 4,917,084	\$ (639,470)
Jan-18	1,229,734	122,500	245,000	1,597,234	\$ 2.6781	\$ 2.6781	\$ 2.6781	\$ 4,277,614	\$ 3.4065	\$ 5,440,976	\$ (1,163,363)
Feb-18	1,229,734	122,500	245,000	1,597,234	\$ 2.6781	\$ 2.6781	\$ 2.6781	\$ 4,277,614	\$ 3.3700	\$ 5,382,677	\$ (1,105,064)
Mar-18	489,384	48,750	97,500	635,634	\$ 2.6781	\$ 2.6781	\$ 2.6781	\$ 1,702,316	\$ 3.0290	\$ 1,925,335	\$ (223,019)
Total	4,667,969	465,000	930,000	6,062,969	\$ 2.8092	\$ 2.8092	\$ 2.8092	\$ 16,237,473	\$ 3.1285	\$19,456,653	\$ (3,219,180)

*Indexes and projected WACOG based on 7/14/16 market prices

MINNESOTA ENERGY RESOURCES - NNG

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Call/Put Options 10,000 Dth/contract

																																								Minnes	sota Energy	y Resources C	orporation
Deal Number		Trade I Number C		Physical St Volume Pr	ike S ice C	rike C ost F	ption Price	Option Cost	Nov-17 Pent Settle*	Pent Settle Cost	Over/(Under) Market	Premium Per Unit	Premium Cost	Total Cost	Deal Number	Purchase Date	Trade Nu Number Cor	umber Ph ntracts Vo	olume	Strike Price	Strike Cost	Option Price	-17 Option Cost	Pent Settle*	Pent Settle Cost	Over/(Under) Market	Premium Per Unit		Total Cost	Deal Number	Purchase T Date Nu	rade Numb Imber Contra	er Physical cts Volume	Strike Price	Strike Cost	Option Price	Jan-18 Option Cost	Pent Settle*	Pent Settle O Cost	ver/(Under) Prem Market Per L	ium Pren Jnit Co	nium Mi ost C	Cost
1 2 3 4 5 6 7 8	05/15/17 06/07/17 07/11/17 08/01/17 09/05/17 10/03/17	50815 52114 53040 54466	12 12 11 10 9	120,000 \$ 3 120,000 \$ 3 110,000 \$ 3 100,000 \$ 3 100,000 \$ 3 90,000 \$ 2	2500 \$ 3 2500 \$ 3 1000 \$ 3 2000 \$ 3	57,500 \$ 2 10,000 \$ 2 20,000 \$ 2	2.8540 \$ 2.8540 \$ 2.8540 \$ 2.8540 \$	342,480 313,940 285,400 285,400	\$ 2.8540 \$ 2.8540 \$ 2.8540 \$ 2.8540	\$ 285,400	\$ - \$ - \$ -	\$ 0.3060 \$ 0.2260 \$ 0.1790 \$ 0.1000 \$ 0.0850 \$ 0.0970	\$ 27,120 \$ 19,690 \$ 10,000 \$ 8,500	\$ 369,600 \$ 333,630 \$ 295,400 \$ 293,900	2 3 4 5	06/14/17 07/17/17 08/10/17 09/12/17	52309 53393 54767	17 1 17 1 17 1 17 1 16 1	70,000 \$ 70,000 \$ 70,000 \$ 70,000 \$ 60,000 \$ 40,000 \$	3.2500 \$ 3.2500 \$ 3.5500 \$	552,500 552,500 603,500 571,200	\$ 3.0650 \$ 3.0650	\$ 521,050 \$ 521,050 \$ 521,050	\$ 3.0650 \$ \$ 3.0650 \$ \$ 3.0650 \$ \$ 3.0650 \$	521,050 521,050 521,050 490,400	\$ - \$ - \$ -	\$ 0.2760 \$ 0.2610 \$ 0.2740 \$ 0.1000 \$ 0.0980 \$ 0.0910	\$ 44,370 \$ 46,580 \$ 17,000	\$ 565,420 \$ 567,630 \$ 538,050 \$ 506,080	2 3 4 5	05/18/17 4/ 06/08/17 5/ 07/12/17 5/ 08/07/17 5/ 09/07/17 5/ 10/05/17 5/	2185 19 3247 19 4611 18	200,000 190,000 190,000 180,000	0 \$ 4.0000 0 \$ 3.7500 0 \$ 3.5000 0 \$ 3.9500 0 \$ 4.0000 0 \$ 3.7500	\$ 750,000 \$ 665,000 \$ 750,500 \$ 720,000	0 \$ 3.1940 0 \$ 3.1940 0 \$ 3.1940 0 \$ 3.1940 0 \$ 3.1940	\$ 638,800 \$ 606,860 \$ 606,860 \$ 574,920	\$ 3.1940 \$ 3.1940 \$ 3.1940 \$ 3.1940	\$ 606 860 \$	- \$0.25 - \$0.27 - \$0.09 - \$0.09	790 \$ 51 560 \$ 5 720 \$ 5 950 \$ 14 970 \$ 1 940 \$ 14	1,200 \$ 1,680 \$ 8,050 \$ 7,460 \$	729,330 690,000 658,540 624,910 592,380 591,840
9 10 11 12 13 14 15 Total			64	640,000	\$ 2,0 \$	58,500 3.2164	s	1,826,560		\$ 1,826,560 \$ 2,8540			\$ 110,760 \$ 0.0538	\$1,937,320 \$ 3.0271	9 10 11 12 13 14 15 Total			98 9	80,000	s	3,379,200 3.4482		\$ 3,003,700 \$ 3.0650	9	3,003,700			\$ 183,290 \$ 0.0542	\$ 3,186,990 \$ 3,2520	9 10 11 12 13 14 15 Total	Total	115	1,150,000	5	\$ 4,400,500 \$ 3.8265		\$ 3,673,100 \$ 3,1940		\$ 3,673,100 \$ \$ 3.1940 \$		\$ 21: \$ 0.	3,900 \$ 3 .0486 \$	3,887,000 3.3800
NNG Other-Cons			53 11	530,000 \$ 3. 110,000 \$ 3.	2164 \$ 1.7	04.695 \$ 3	2.8540 \$	1.512.620	\$ 2.8540 \$ 2.8540	\$ 1.512.620	s -	\$ 0.1731	\$ 91.723		NNG Other-Cons	81 17	32.65% 17.35%	81 8 17 1	\$10,000 \$	3.4482 \$	2,793,012	\$ 3.0650 \$	\$ 2,482,650 \$ 521,050	\$ 3.0650 \$	2,482,650	s -		\$ 151,495 \$ 31,795	2,634,145	NNG Other-Cons		.61% 95	950,000	\$ 3.8265	\$ 3,635,196 \$ 765 304	\$ 3.1940	\$ 3.034.300	\$ 3.1940 \$ 3.1940			860 \$ 17	6,700 \$ 3	8,211,000 676,000
Total	64	100.0%	64	640,000 \$ 3.							s -		\$ 110,760		Total	98	100.0%						\$ 3,003,700			s -		\$ 183,290		Total		0.0% 115			\$ 4,400,500						860 \$ 21:		3,887,000
								F	Feb-18	a . a										0. 7	0.1	Mar	-18								a . I			0.0	0.2	L e s	Total						
Deal Number	Date	Number C	Contracts	Physical St Volume Pr	ike Si ice C	rike C ost F	ption Price	Option Cost	Settle*	Pent Settle Cost	Market	Premium Per Unit	Cost	Total Cost	Number	Purchase Date	Number Co	ntracts Vo	olume	Strike Price	Strike Cost	Option Price	Option Cost	Pent Settle*	Cost	Over/(Under) Market	Premium Per Unit	Cost	Total Cost	Deal Number	Date	% Contra	er Physical cts Volume	Price	Strike Cost	Option Price	Option Cost	Settle*	Cost	ver/(Under) Prem Market Per U	Jnit Co	nium I ost C	lotal Cost
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*Prices from 10/24/16 NYMEX market

Attachment 12: Forecast Methodology for MERC Demand Entitlement Effective November 1, 2017

- 1. <u>Peak-day</u>
 - a. <u>Purpose</u>

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 pipelines¹

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

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	International Falls
		Consolidated	
2	Great Lakes Gas	MERC	Bemidji
	Transmission (GLGT	Consolidated	
3	GLGT	MERC	Cloquet
		Consolidated	

¹ MERC acquired Interstate Power & Light Company's Minnesota natural gas operations and customers in 2015. The Commission's Order Approving Sale Subject to Conditions in Docket No. G-001,011/PA-14-107 required MERC to maintain the transitioned customers on a separate PGA (MERC – NNG – Albert Lea). Pursuant to the Commission's Order in Docket No. G011/GR-15-736, the NNG and NNG – Albert Lea PGAs were consolidated effective July 1, 2017, and MERC is submitting two demand entitlement petitions (NNG and Consolidated) for the 2017-2018 heating season.

4	Viking Gas	MERC	Fargo
	Transmission (VGT)	Consolidated	
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).
- Obtain daily small volume interruptible volumes by pipeline and by weather station (Data B).
- Calculate daily "firm" volumes by subtracting both Data A and Data B from total throughput volumes.
- Perform quality control on volumetric data (e.g., identify missing or bad reads, and, to the extent possible, fix missing or bad reads).
- Perform firm peak day regressions. In response to comments from the Minnesota Department of Commerce, Division of Energy Resources (Department):
 - a. Incorporate a methodology to mitigate the impact of autocorrelation.
 - b. Provide a reasonable explanation whenever a regression model is selected that does not have an intercept.

- 8. Add back Daily Firm Capacity (DFC) customer selections.
 - 3. <u>Process</u>

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) for the time period January 1996-December 2016 for each weather station. Note, this is a change in practice from prior analysis that used a rolling 20-year period. The change was included because many weather stations experienced historically cold weather in the January/February 1996 time period and without inclusion of that additional data from January/February 1996, AHDD were materially lower and not reflective of MERC's capacity needs.
- 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).

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 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 for the time period January 1996-December 2016. This is a change from prior analysis that used a rolling 20-year period. The change was included because many weather stations experienced historically cold weather in the January/February 1996 time period and without inclusion of that additional data from January/February 1996, AHDD65 were materially lower and not reflective of MERC's capacity needs. The results are provided in the following table:

		<u>Avg.</u>	<u>Avg.</u>		
Station	Date	Temp	Wind	<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:

- Gather the net daily metered volumes and weather station data including AHDD65.²
- 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 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.
- In response to comments from the Department, the regression methodology incorporates a process to mitigate the impact of autocorrelation. See section below on autocorrelation.
- In response to comments from the Department, provide an explanation whenever we choose to use a regression model that does not have an intercept.
- Summarize the Baseload and Use/AHDD65 and Use/Prior Day AHDD65 from each regression.
- 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 since January 1996.

iii. Volume Risk Adjustments

² Temperature and weather data were obtained from DTN (formerly 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.

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 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 Regulatory Affairs 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 the Company's Gas Supply department, 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

<u>GLGT</u> Paper Mills = Blandon mapped to Bemidji, and Sappi and USG mapped to Cloquet

- <u>VGT</u> Lamb Weston mapped to Fargo
- NNG Taconites / Direct Connects =
 - CCI EMPIRE IND DEL PT 2 TILDEN mapped to Cloquet
 - CCI NORTHSHORE mapped to Cloquet

Minnesota Energy Resources Corporation-NNG August-<u>November</u>1, 2017 Demand Entitlement Filing Attachment 12

- 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

<u>NNG</u> 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

<u>VGT</u>

- DETROIT LAKES MIDDLE SCHOOL
- ROSSMAN SCHOOL

<u>GLGT</u>

- AMERIPRIDE
- NORTHLAND APTS

<u>NNG</u>

• HENDRICKS HOSPITAL

BRAND FX BODY 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 nointercept 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

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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-15-722 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 the 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.

ATTACHMENT D

Docket No. G011/M-17-588_____

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

CERTIFICATE OF SERVICE

I, Kristin M. Stastny, hereby certify that on the 1st day of <u>November</u>August, 2017, on behalf of Minnesota Energy Resources Corporation (MERC) I electronically filed a true and correct copy of MERC's Petition for Approval of a Change in Demand Entitlement on <u>www.edockets.state.mn.us</u>. Said documents were also served via U.S. mail and electronic service as designated on the attached service list.

Dated this 1st day of <u>NovemberAugust</u>, 2017.

<u>/s/ Kristin M. Stastny</u> Kristin M. Stastny

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