



Minnesota Energy Resources Corporation
2685 145th Street West
Rosemount, MN 55068
www.minnesotaenergyresources.com

August 1, 2019

VIA ELECTRONIC FILING

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101

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

Docket No. G011/M-19- ____

Dear Mr. Wolf:

In accordance with Minnesota Rule 7825.2910, subpart 2, please find enclosed Minnesota Energy Resources Corporation's (MERC or Company) request to change demand entitlements for its NNG purchased gas adjustment area. Please note that any updated information will be provided with MERC's November 1, 2019, filing. MERC is also filing Excel and PDF versions of the attachments.

Pursuant to Minnesota Rule 7825.2910, subpart 3, a Notice of Availability has been sent to all intervenors in the Company's previous two rate cases.

Please contact me at (414) 221-2374 if you have any questions regarding the information in this filing. Thank you for your attention to this matter.

Sincerely,

/s/ Mary L. Wolter

Mary L. Wolter
Director – Gas Regulatory Planning & Policy

Enclosures

cc: Service List

ATTACHMENT A

August 1, 2019

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:

Mary Wolter
Minnesota Energy Resources Corporation
2685 145th Street West
Rosemount, MN 55068
(414) 221-2374

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.

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

**Katie Sieben
Dan Lipschultz
Matt Schuerger
Valerie Means
John Tuma**

**Chair
Commissioner
Commissioner
Commissioner
Commissioner**

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

Docket No. G011/M-19-____

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, 2019.

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

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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-19-____

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, 2019.

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:** Affidavit 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 2019-2020 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
2685 145th Street West
Rosemount, MN 55068
(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
KStastny@briggs.com
(612) 977-8656

C. Date of the Filing and Proposed Effective Date

Date of filing: August 1, 2019
Proposed Effective Date: November 1, 2019

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



Mary L. Wolter
Director—Gas Regulatory Planning & Policy
Mary.Wolter@wecenergygroup.com
2685 145th Street West
Rosemount, MN 55068
(414) 221-2374

If additional information is required, please contact Mary Wolter at (414) 221-2374.

DATED: August 1, 2019

Respectfully submitted,
MINNESOTA ENERGY RESOURCES
CORPORATION

By: /s/ Mary L. Wolter
Mary W. Wolter
2685 145th Street West
Rosemount, MN 55068
Telephone: (414) 221-2374

STATE OF MINNESOTA
BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Katie Sieben
Dan Lipschultz
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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-19-____

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, 2019. Included with this filing are the following Attachments:

Attachment 1: Design-Day Demand Summary

Attachment 2: Sales Forecast

Attachment 3: Current and Proposed Entitlement Levels

Attachment 4: Rate Impact of the Proposed Demand Change

Attachment 5: Financial Option Summary

Attachment 6: Winter Plan

Attachment 7: Entitlement History

Attachment 8: Change in Entitlement Levels and Related Demand Costs

Attachment 9: Actual Throughput and Design Day Forecast Estimated Throughput

Attachment 10: Customer Counts

Attachment 11: Hedging Summary

Attachment 12: Forecast Methodology

Through this filing, MERC also addresses compliance with the Commission's May 8, 2018, Order in Docket No. G011/M-15-895, which required MERC to provide a discussion of any capacity substitutions in its annual demand entitlement filings. Finally, MERC provides an analysis and discussion of MERC's performance during the extreme cold weather that occurred between January 29 and February 1, 2019, in accordance with the Department of Commerce, Division of Energy Resources' (the "Department's") requests in Docket No. G999/CI-19-160.

II. Discussion

A. MERC's NNG Design-Day Requirements

Minnesota Rule 7825.2910, subpart 2(b) requires that a filing upon change in demand include the utility's Design-Day demand by customer class and the change in Design-Day demand, if any, necessitating the demand revision. The NNG Design-Day requirement has increased by 3,534 dekatherms (dth) from the November 1, 2018, filing. This represents a 1.3% increase in Design-Day requirement over the 2018-2019 heating season.

**Table 1: MERC Proposed NNG Reserve Margins
For the 2019-2020 Heating Season**

	Reserve Margin 2019-2020 Heating Season	Reserve Margin 2018-2019 Heating Season	Change
NNG Zone EF	13.33%	1.25%	12.08%

For the Demand Entitlement filing effective November 1, 2019, the total Design-Day requirement for MERC NNG is 277,376 dth (Attachment 1). The difference between the total Design-Day requirement and total Design-Day capacity results in a 13.33% 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. The increase in MERC’s 2019-2020 reserve margin is driven by the Northern Natural Gas Rochester expansion, with the second phase of additional capacity being available November 1, 2019. In accordance with the Commission’s May 5, 2017, Order Approving Rochester Project and Granting Rider Recovery with Conditions in Docket No. G011/M-15-895, MERC has included the additional Rochester capacity costs for recovery through the commodity portion of the purchased gas adjustment. As reflected in Attachment 8, MERC has placed the SE Minnesota Expansion volumes associated with the Rochester project in the commodity portion as well. The 2018 SE Minnesota volumes were previously in the demand portion of the purchase gas adjustment (5,439 dth/day) and have been moved from the TFX12 (Max Rate) row in demand to the TFX12 (SE MN Expansion) row in commodity in both Attachment 4.2 where the rate is calculated and Attachment 8 where there is a comparison with the previous filing.

B. Gas Supply

Minnesota Rule 7825.2910, subpart 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, 2019

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

III. Additional Filing Requirements

A. Daily Design-Day Estimate to Actual Comparison

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

B. 2019 Cold Weather Event

In Docket No. E,G999/CI-19-160, the Commission initiated an investigation into utility operational experiences during the severe cold weather event that occurred between January

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

28 and February 1, 2019. As part of that proceeding, the Department requested information regarding whether each utility would have had sufficient capacity to serve its firm customers if weather conditions reached the utility’s planning objective; an updated design-day analysis for the past heating season incorporating actual data and usage from the 2018-2019 heating season; a discussion of unexpected events or usage patterns that were experienced during the extreme cold weather event; and a discussion of any improvements the utility plans to undertake as a result of the cold weather event to ensure firm reliability during a future design-day or near design-day event.

MERC has incorporated the 2018-2019 heating season data into the Design-Day analysis and forecast presented in this filing. As shown in Attachment 1, page 1, MERC-NNG experienced throughput at a near Design-Day level in January 2019. The data from this past winter did not significantly impact the Design-Day forecast, and MERC is confident in its ability to meet the requirements of its firm customers as shown in Attachment 3. The firm customer throughput from last winter is shown in the following table.

<u>Date</u>	<u>Capacity (dth/day)</u>	<u>Firm Customer Load (dth)</u>
1/29/19	277,256	268,848
1/30/19	277,256	263,134
1/31/19	277,256	231,273
2/1/19	277,256	171,736

C. Average Customer Counts

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

D. 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 true-up filings, as well as the 2014 Demand Entitlement filing, also reflected this change. The current MERC-NNG demand entitlement filing includes detailed evidence of the allocation of balancing costs to the commodity portion of the PGA in Attachment 4, page 2 of 2.

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

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

1. Design-Day Deliverability Changes

As shown in Attachment 3, MERC-NNG proposes a net increase of 37,093 dth/day in Design-Day Deliverability. This increase is due to Phase II of the Rochester expansion project and the associated SE Minnesota capacity increases, and is scheduled to go in service on November 1, 2019.

2. Other Demand Entitlement Changes

As shown in Attachment 3, MERC–NNG proposes a 37,093 dth/day increase in April/October and summer deliverability. This increase is, again, the result of Phase II of the Rochester expansion project and the associated SE Minnesota capacity increases.

MERC-NNG contract 112495 has a base and a variable component as outlined in the FERC-approved NNG tariff. The base and variable components are set each year as a result of MERC’s use of contract 112495 during the April – October period, which is driven by customer load. The variable component of this contract decreased by 74 dth/day, with a corresponding increase in the base component. This change does not result in an increase or decrease in demand entitlement levels, and results in an approximately \$1,400 decrease in projected contract costs.

As discussed in MERC’s May 31, 2017, filing in Docket No. G011/M-16-650, effective June 1, 2017, MERC acquired released storage capacity on the NNG system. The release contracts were effective June 1, 2017, and had a total volume of 1,500,000 Dth. Contract 132024 represents 500,000 Dth of the acquired capacity and will continue through May 31, 2022. Contract 132112 for 1,000,000 Dth expired on May 31, 2017 and was re-released to MERC at the same volume and rate beginning June 1, 2018. This contract will expire concurrent to contract 132024 on May 31, 2022. The new contract number is 133736 and is shown in Attachment 4, page 2 and in Attachment 8.

F. Financial Option Units and Premiums

MERC has partially completed its purchases of future contracts and call options for the 2019-2020 winter period. Current financial hedge volumes and costs are shown in Attachments 5 and 11 (page 1 and 3). The call option premium costs additionally flow through the spreadsheet in Attachment 4, pages 1 and 2, and in Attachment 8. No other changes have been made to the MERC-NNG demand entitlements. MERC will provide an update with its

November 1, 2019, filing. 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:

- i. a list of all financial instruments purchased for the upcoming heating season (see Attachment 11);
- ii. the cost premium associated with each contract (see Attachment 5);
- iii. the size (in 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 2019-2020 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 2019-2020 winter is \$2.8090/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 \$2.1616/dth. MERC has purchased call options at an average strike price of \$3.6943/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.

G. PGA Cost Recovery

MERC proposes to begin recovering the costs associated with the change in demand-related costs in its monthly PGA effective November 1, 2019. Rate impacts associated with this change can be found on Attachment 4.

H. 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 its system and upstream entitlement levels. MERC's process requires an evaluation of the system capability before a customer is allowed 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 demand entitlement levels.

I. Rochester Project Compliance

The Commission's May 8, 2018, Order in Docket No. G011/M-15-895 required MERC to (1) provide semiannual updates in Docket No. G011/M-15-895 explaining what, if any, capacity-release-related activity occurred during the previous six months (e.g., when capacity release was offered, amount accepted, prices),³ and (2) provide a detailed discussion of each capacity substitution in its annual demand entitlement filings on a going-forward basis.

The second tranche of additional capacity resulting from the NNG upgrades related to the Rochester Project approved in Docket No. G011/M-15-895 will be available on November 1, 2019. This second phase of additional capacity will result in MERC moving from a reserve

³ MERC provides an update here and will also submit a compliance filing in Docket No. G011/M-15-895.

margin of 1.25% to reserve margin of 13.33%. As a result, MERC is planning to take action as laid out in the Capacity Release Plan filed on August 31, 2017, and approved by the Commission by Order dated May 8, 2018. MERC will submit a compliance filing in accordance with the Commission's May 8, 2018, Order in six months or on approximately February 1, 2020, which will address details regarding released capacity stemming from the second phase of the Rochester NNG upgrades.

With respect to capacity substitutions related to the additional Rochester Project capacity, as discussed in MERC's August 31, 2017, Capacity Release Plan, MERC received Commission approval to expand its service into the communities of Balaton and Esko (Docket Nos. G011/M-16-654 and G011/M-16-655, respectively). The capacity created by the Rochester Project has allowed MERC to absorb this additional firm sales load (estimated peak load of approximately 2,500 dth/day) without paying for additional pipeline investments. Additionally, in Docket No. G011/M-18-460, MERC received Commission approval, by order dated March 29, 2019, to extend service into Pengilly. MERC plans to utilize existing capacity to serve the new customers in the Pengilly project area as well. No additional capacity substitutions have occurred. MERC will provide updates on future capacity substitutions in future Demand Entitlement filings and updates.

IV. Conclusion

MERC respectfully requests that the Commission approve the requested changes to be recovered in the Purchased Gas Adjustment (PGA) beginning November 1, 2019.

DATED: August 1, 2019

Respectfully submitted,

MINNESOTA ENERGY RESOURCES
CORPORATION

By: /s/ Mary L. Wolter

Mary L. Wolter

2685 145th Street West

Rosemount, MN 55068

Telephone: (414) 221-2374

MINNESOTA ENERGY RESOURCES - NNG

DESIGN-DAY DEMAND SUMMARY

NOVEMBER 1, 2019

NNG

Design Day Requirement		277,376
Total Peak Day Entitlement		314,349
2018/19 Firm Peak Day Actual Sendout	1/29/2019	268,848
Firm Annual Throughput - Minnesota		24,568,312
No. of Firm Customers		201,190
Department Load Factor Calculation		25.04%

MINNESOTA ENERGY RESOURCES - NNG

NNG MINNESOTA DESIGN DAY REQUIREMENTS

NOVEMBER 1, 2019

NNG

Pipeline Group	2018/19 Customer Count	Zone Total Customer Count	1/20 Design DDD	Regression Factors		Regression Total	Regression Adjustment	1/20 Requirements Regression Load	Estimated Contract Demand Units	Total *
				Intercept	Slope					

PEAK

NNG	201,190	201,190	99	6,734	2,641	267,600	9,681	277,281	95	277,376
Total	201,190	201,190								277,376

OFF PEAK

NNG	201,190	201,190	55	6,734	2,641	152,006	9,682	161,688	95	161,783
Total	201,190	201,190								161,783

* Adjusted for customer growth

MINNESOTA ENERGY RESOURCES - NNG

**DESIGN-DAY DEMAND PER CUSTOMER - GS
NOVEMBER 1, 2019**

NNG

<u>Heating Season</u>	<u>No. of Firm Customers</u>	<u>Design Day Requirements</u>	<u>MMBtu /Customer /Day</u>
19/20	201,190	277,376	1.38
18/19	198,628	273,842	1.38
17/18	197,991	267,783	1.35
16/17	195,311	262,324	1.34
15/16	192,016	259,076	1.35
14/15	189,078	273,917	1.45
13/14	189,254	258,913	1.37
12/13	187,545	239,325	1.28
11/12	185,890	247,982	1.33
10/11	186,610	234,907	1.26

MINNESOTA ENERGY RESOURCES - NNG

SUMMER/WINTER USAGE - Dth
PROJECTED 12 MONTHS ENDING JUNE 2020
NNG

<u>Class</u>	<u>Summer Apr-Oct</u>	<u>Winter Nov-Mar</u>	<u>Total</u>
GS	6,786,860	17,766,439	24,553,300
SVI	494,515	1,197,653	1,692,167
SVJ	4,941	7,625	12,566
LVI	496,010	616,547	1,112,556
LVJ	713	1,734	2,447
SLV			0
Total	<u>7,783,038</u>	<u>19,589,998</u>	<u>27,373,036</u>

**Attachment 3
 NNG**

MINNESOTA ENERGY RESOURCES - NNG

ENTITLEMENT LEVELS

PROPOSED TO BE EFFECTIVE NOVEMBER 1, 2019

<u>Capacity Type</u>	<i>Summer</i>			<i>April/October</i>			<i>Winter</i>		
	2018/19 MMBtu	Change MMBtu	Proposed MMBtu	2018/19 MMBtu	Change MMBtu	Proposed MMBtu	2018/19 MMBtu	Change MMBtu	Proposed MMBtu
TF-12 Base & Variable	84,709	0	84,709	84,709	0	84,709	84,709	0	84,709
TF5	0	0	0	0	0	0	36,275	0	36,275
TFX - 12	48,236	37,093	85,329	48,236	37,093	85,329	48,236	37,093	85,329
TFX - 5	0	0	0	0	0	0	104,501	0	104,501
TFX- (Apr/Oct) Offpeak*	0	0	0	2,000	0	2,000	0	0	0
Bison	50,000	0	50,000	50,000	0	50,000	50,000	0	50,000
NBPL	50,000	0	50,000	50,000	0	50,000	50,000	0	50,000
Northwest Gas (Windom)	2,500	0	2,500	2,500	0	2,500	2,500	0	2,500
Northwestern Energy (Ortonville)	1,035	0	1,035	1,035	0	1,035	1,035	0	1,035
NNG Zone Delivery Call Option	0	0	0	0	0	0	0	0	0
Total	136,480	37,093	173,573	138,480	37,093	175,573	277,256	37,093	314,349
Heating Season Forecasted Design Day-Adjusted							273,842	3,534	277,376
Non-Heating Season Forecasted Design Day				163,989	(2,206)	161,783			
Heating Season Capacity Surplus/Shortage							3,414	33,559	36,973
Non-Heating Season Capacity Surplus/Shortage				(25,509)	39,299	13,790			
*Not included in Heating Season Total entitlement									
Reserve Margin				-15.56%	24.08%	8.52%	1.25%	12.08%	13.33%

MINNESOTA ENERGY RESOURCES - NNG
RATE IMPACT OF THE PROPOSED DEMAND CHANGE
NOVEMBER 1, 2019

All costs in \$/Dth	Base Cost of Gas G011/MR-17-564 1-Jul-19	Demand Charge Oct 1, 2018	Demand Charge Demand Filing Nov 1, 2018 (as revised 7/2/19)	Most Recent PGA July 1, 2019	Proposed Effective Nov 1, 2019	Result of Proposed Change			
						Change from Last Rate Case	Change from Nov 1, 2018 Demand Filing	Change from Last PGA %	Change from Last PGA \$

1) General Service Residential: Avg. Annual Use:		87		Dth					
Commodity Cost	\$3.6673	\$3.4787	\$3.9141	\$2.9219	\$4.1051	\$0.4378	\$0.1910	40.49%	\$1.1832
Demand Cost	\$0.9363	\$0.9367	\$0.9493	\$0.9493	\$0.9227	(\$0.0136)	(\$0.0266)	-2.80%	(\$0.0266)
Commodity Margin	\$2.4116	\$2.4116	\$2.4116	\$2.4686	\$2.4686	\$0.0570	\$0.0570	0.00%	\$0.0000
Total Cost of Gas	\$7.0152	\$6.8270	\$7.2750	\$6.3398	\$7.4964	\$0.4812	\$0.2214	18.24%	\$1.1566
Avg Annual Cost	\$610.78	\$594.39	\$633.40	\$551.98	\$652.68	\$41.90	\$19.28	18.24%	\$100.70
Effect of proposed commodity change on average annual bills:									\$103.02
Effect of proposed demand change on average annual bills:									(\$2.31)

2) Small C&I Firm, Class 2: Avg. Annual Use:		687		Dth					
Commodity Cost	\$3.6673	\$3.4787	\$3.9141	\$2.9219	\$4.1051	\$0.4378	\$0.1910	40.49%	\$1.1832
Demand Cost	\$0.9363	\$0.9367	\$0.9493	\$0.9493	\$0.9227	(\$0.0136)	(\$0.0266)	-2.80%	(\$0.0266)
Commodity Margin	\$1.6885	\$1.6885	\$1.6885	\$1.6857	\$1.6857	(\$0.0028)	(\$0.0028)	0.00%	\$0.0000
Total Cost of Gas	\$6.2921	\$6.1039	\$6.5519	\$5.5569	\$6.7135	\$0.4214	\$0.1616	20.81%	\$1.1566
Avg Annual Cost	\$4,320.83	\$4,191.59	\$4,499.23	\$3,815.96	\$4,610.22	\$289.39	\$110.99	20.81%	\$794.26
Effect of proposed commodity change on average annual bills:									\$812.51
Effect of proposed demand change on average annual bills:									(\$18.25)

3) Large C&I Firm Class 3: Avg. Annual Use:		17,946		Dth					
Commodity Cost	\$3.6673	\$3.4787	\$3.9141	\$2.9219	\$4.1051	\$0.4378	\$0.1910	40.49%	\$1.1832
Demand Cost	\$0.9363	\$0.9367	\$0.9493	\$0.9493	\$0.0067	(\$0.9296)	(\$0.9426)	-99.29%	(\$0.9426)
Commodity Margin	\$1.6885	\$1.6885	\$1.6885	\$1.2453	\$1.2453	(\$0.4432)	(\$0.4432)	0.00%	\$0.0000
Total Cost of Gas	\$6.2921	\$6.1039	\$6.5519	\$5.1165	\$5.3571	(\$0.9350)	(\$1.1948)	4.70%	\$0.2406
Avg Annual Cost	\$112,920.62	\$109,543.11	\$117,583.10	\$91,822.82	\$96,141.57	(\$16,779.05)	(\$21,441.53)	4.70%	\$4,318.75
Effect of proposed commodity change on average annual bills:									\$21,234.19
Effect of proposed demand change on average annual bills:									(\$16,915.44)

4) Small C&I Interruptible, Class 2: Avg. Annual Use:		3,942		Dth					
Commodity Cost	\$3.6673	\$3.4787	\$3.9141	\$2.9219	\$4.1051	\$0.4378	\$0.1910	40.49%	\$1.1832
Commodity Margin	\$0.9740	\$0.9740	\$0.9740	\$1.0453	\$1.0453	\$0.0713	\$0.0713	0.00%	\$0.0000
Total Cost of Gas	\$4.6413	\$4.4527	\$4.8881	\$3.9672	\$5.1504	\$0.5091	\$0.2623	29.82%	\$1.1832
Avg Annual Cost	\$18,295.41	\$17,551.97	\$19,268.26	\$15,638.19	\$20,302.21	\$2,006.81	\$1,033.95	29.82%	\$4,664.02
Effect of proposed commodity change on average annual bills:									\$4,664.02

5) Large C&I Interruptible, Class 3: Avg. Annual Use:		25,685		Dth					
Commodity Cost	\$3.6673	\$3.4787	\$3.9141	\$2.9219	\$4.1051	\$0.4378	\$0.1910	40.49%	\$1.1832
Commodity Margin	\$0.5329	\$0.5329	\$0.5329	\$0.9453	\$0.9453	\$0.4124	\$0.4124	0.00%	\$0.0000
Total Cost of Gas	\$4.2002	\$4.0116	\$4.4470	\$3.8672	\$5.0504	\$0.8502	\$0.6034	30.60%	\$1.1832
Avg Annual Cost	\$107,881.42	\$103,037.26	\$114,220.44	\$99,328.38	\$129,718.67	\$21,837.24	\$15,498.23	30.60%	\$30,390.29
Effect of proposed commodity change on average annual bills:									\$30,390.29

Note: Average Annual Use based on new class structure found in 2018 MERC Gas Rate Design in Docket GR-17-563
 Note: Rates do not include the ACA adjustment.

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

NOVEMBER 1, 2019
 NNG

IV. NORTHERN NATURAL GAS COMPANY'S RATES -- CURRENT COST OF GAS EFFECTIVE						01-Nov-19
	Tariff-Summer(7 mths)	Tariff-Winter(5 mths)	Wt. Annual	GRI	Total	
TF-12B	112495 \$	5.6830 \$	10.2300	\$7.5776	\$0.0000	\$7.5776
TF-12B Discount	112495 \$	5.6830 \$	10.0320	\$7.4951	\$0.0000	\$7.4951
TF-12V	112495 \$	5.6830 \$	13.8660	\$9.0926	\$0.0000	\$9.0926
TF-5	112495 \$	- \$	15.1530	\$15.1530	\$0.0000	\$15.1530
TFX	112486 \$	5.6830 \$	15.1530	\$9.6288	\$0.0000	\$9.6288
TFX-5	112486 \$	- \$	15.1530	\$15.1530	\$0.0000	\$15.1530
TFX-5 Discount	112486 \$	- \$	10.0320	\$10.0320	\$0.0000	\$10.0320
TFX Rochester	112486 \$	37.1175 \$	37.1175	\$37.1175	\$0.0000	\$37.1175
TFX Rochester II	112486 \$	10.7714 \$	10.7714	\$10.7714	\$0.0000	\$10.7714
TFX - Discount	111866 \$	2.2192 \$	15.1392	\$7.6025	\$0.0000	\$7.6025
TFX - Discount	111866 \$	4.8640 \$	4.8640	\$4.8640	\$0.0000	\$4.8640
TFX - Discount	111866 \$	5.4720 \$	5.4720	\$5.4720	\$0.0000	\$5.4720
TFX-5	127852 \$	- \$	15.1530	\$15.1530	\$0.0000	\$15.1530
Gas Cost						\$2.9695 /Dth

V. ANNUAL SALES -- As approved in Docket No. G011/MR-17-564 264,337,861

VI. MERC-NNG'S CURRENT COST OF GAS EFFECTIVE:								01-Nov-19
A. GS-NNG	Contract # (s)	Monthly Entitlements		Rate \$/Dth	Contract Costs	Contract Costs	Rate/Therm	
		(Dth)	Months					
TF12B (Max Rate) Winter	112495	46,580	5	\$ 10.2300	=	\$2,382,567	\$	0.01006
TF12B (Max Rate) Summer	112495	46,580	7	\$ 5.6830	=	\$1,852,999	\$	0.00782
TF12V (Max Rate)	112495	32,929	12	\$ 9.0926	=	\$3,592,923	\$	0.01517
TF5 (Max Rate)	112495	36,275	5	\$ 15.1530	=	\$2,748,375	\$	0.01160
TF12B (Discount-Winter)	112495	5,200	12	\$ 7.4951	=	\$467,694	\$	0.00197
TFX12 (Max Rate)	112486	10,822	12	\$ 9.6288	=	\$1,250,434	\$	0.00528
TFX Apr (Max Rate)	112486	2,000	1	\$ 5.6830	=	\$11,366	\$	0.00005
TFX Oct (Max Rate)	112486	2,000	1	\$ 5.6830	=	\$11,366	\$	0.00005
TFX5 (Max Rate)	112486	77,688	5	\$ 15.1530	=	\$5,886,031	\$	0.02485
TFX5 (Discount)	112486	1,800	5	\$ 10.0320	=	\$90,288	\$	0.00038
TFX12 (Discount)	111866	1,283	12	\$ 4.8640	=	\$74,886	\$	0.00032
TFX12 (Discount)	111866	8,271	12	\$ 5.4720	=	\$543,107	\$	0.00229
TFX12 (Discount)	111866	11,921	12	\$ 7.6025	=	\$1,087,553	\$	0.00459
TFX5 (Discount)	111866	379	5	\$ 4.8640	=	\$9,217	\$	0.00004
TFX5 (Discount)	111866	2,445	5	\$ 5.4720	=	\$66,895	\$	0.00028
TFX5 (Discount)	111866	22,189	5	\$ 15.1392	=	\$1,679,619	\$	0.00709
Windom		2,500	12	\$ -	=	\$0	\$	-
Northwestern Energy		1,035	12	\$ 8.3382	=	\$103,560	\$	0.00044
Total Demand Cost						\$21,858,881	\$	0.09227
Test year sales as approved in Docket No. G011/GR-17-563								236,895,506
GS-1 Demand Current Cost of Gas/therm								\$ 0.09227
GS-1 Commodity Current Cost of Gas/therm								\$ 0.41051
Total GS-1 Current Cost of Gas/therm								\$ 0.50278

B. GS-NNG, SVI-NNG, LVI-NNG, SJ-NNG, LJ-NNG, SLV-Commodity							
	Contract #	Monthly Entitlement (Dth)	Months	Rate (\$/Dth)	Contract Costs	Contract Costs	Rate (\$/therm)
FDD - Reservation	118657	81,508	12	\$ 1.7140	=	\$1,676,457	\$ 0.00634
FDD - Storage Cycle	118657	939,864	5	\$ 0.3567	=	\$1,676,248	\$ 0.00634
FDD - Reservation	118657	5,550	12	\$ 3.3157	=	\$220,826	\$ 0.00084
FDD - Storage Cycle	118657	64,000	5	\$ 0.6901	=	\$220,832	\$ 0.00084
FDD - Reservation	133736	17,345	12	\$ 1.7140	=	\$356,752	\$ 0.00135
FDD - Storage Cycle	133736	200,000	5	\$ 0.3567	=	\$356,700	\$ 0.00135
FDD - Reservation	132024	8,672	12	\$ 1.7140	=	\$178,366	\$ 0.00067
FDD - Storage Cycle	132024	100,000	5	\$ 0.3567	=	\$178,350	\$ 0.00067
Firm Deferred Delivery Storage Contracts						\$4,864,530	\$ 0.01840

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

	Contract #	Monthly Entitlement (Dth)	Months	Rate (\$/Dth)	Contract Costs	Contract Costs	Rate (\$/therm)
Bison	FT0003	50,000	12	\$ 17.4896	=	\$10,493,750	\$ 0.03970
NBPL	T8673F	50,000	12	\$ 6.3905	=	\$3,834,300	\$ 0.01451
TFX12 (Rochester)	112486	10,500	12	\$ 37.1175	=	\$4,676,805	\$ 0.01769
TFX12 (Rochester II)	112486	34,500	12	\$ 10.7714	=	\$4,459,360	\$ 0.01687
TFX12 (SE MN Expansion)	112486	8,032	12	\$ 9.6288	=	\$928,062	\$ 0.00351
						\$24,392,277	\$ 0.09228

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

	Annual Sales (Dth)	Rate (\$/Dth)	Commodity Cost	Rate Case Sales (therm)	Rate (\$/therm)
CD-1 Commodity	28,433,786	x	\$2.9695	\$78,495,128	264,337,861 \$ 0.29695
SMS-Bal Service	272,160	x	\$2.1800	\$593,309	264,337,861 \$ 0.00224
Physical Forward Start Premium				\$0	264,337,861 \$ -
Call Option Premium				\$168,419	264,337,861 \$ 0.00064

GS-NNG, SVI-NNG, LVI-NNG, SJ-NNG, LJ-NNG, SLV Commodity Current Cost of Gas/therm \$84,121,385 264,337,861 \$ 0.41051

MINNESOTA ENERGY RESOURCES - NNG

**Financial Options
 Heating Season 2019-2020**

Units - Gas Daily Peaker Packages (Physical)

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

Premium - Gas Daily Peaker (Monthly Cost)

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

Units - Futures (Dth)

	<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Term Total</u>
	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	
1	05/02/19	1,688	05/14/19	2,667	05/16/19	2,998	05/07/19	2,700	05/09/19	2,129	367,931
2	06/04/19	1,688	06/13/19	2,401	6/18/19	2,725	06/06/19	2,700	06/11/19	1,863	342,845
3	07/02/19	1,688	01/00/00	-	01/00/00	-	07/09/19	2,400	01/00/00	-	117,069
4	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	-
5	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	-
6	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	-
7	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	-
8	01/00/00	-									-
Total		5,063		5,068		5,723		7,800		3,992	827,845

Units - Call Options (Dth)

	<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Term Total</u>
	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	<u>Contract Date</u>	<u>Daily Volume</u>	
1	43587	3,046	43594	4,801	43592	2,972	43599	5,357	43601	3,726	597,868
2	43620	3046.153846	43627	4801.488834	43237	2701.957541	43629	5059.52381	43634	3725.806452	581158.12
3	07/02/19	3,046	07/11/19	4,535	06/06/19	5,404	01/00/00	-	01/00/00	-	399,483
4	01/00/00	-	01/00/00	-	07/09/19	5,134	01/00/00	-	01/00/00	-	159,145
5	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	-
6	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	01/00/00	-	-
7					01/00/00	-					-
8											-
Total		9,138		14,138		16,212		10,417		7,452	1,737,654

Premium - Call Option (Monthly Cost)

	<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>		<u>Total Premium</u>	
	<u>Option Premium</u>	<u>Premium</u>	<u>Option Premium</u>	<u>Premium</u>	<u>Option Premium</u>	<u>Premium</u>	<u>Option Premium</u>	<u>Premium</u>	<u>Option Premium</u>	<u>Premium</u>		
1	0.095	8,682	0.09	13,396	0.095	8,753	0.093	13,950	0.098	11,319	0.09383297	56,100
2	0.1	9,138	0.1	14,885	0.098	8,209	0.097	13,742	0.1	11,550	0.09898045	57,523
3	\$ 0.1000	\$ 9,138	\$ 0.0970	\$ 13,636	\$ 0.0990	\$ 16,585	\$ -	\$ -	\$ -	\$ -	\$ 0.0985	\$ 39,359
4	\$ -	\$ -	\$ -	\$ -	\$ 0.0970	\$ 15,437	\$ -	\$ -	\$ -	\$ -	\$ 0.0970	\$ 15,437
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	#DIV/0!	\$ -
6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	#DIV/0!	\$ -
7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 0.0983	\$ 26,958	\$ 0.0956	\$ 41,917	\$ 0.0975	\$ 48,983	\$ 0.0949	\$ 27,692	\$ 0.0990	\$ 22,869	\$ 0.0969	\$ 168,419

Units - Collar Floor (put)

No Puts were purchased.

19/20 Winter Portfolio Plan - NNG MERC Hedging Plan

10,000 Contract Size

System	Purchase Month	Contracts		Contracts		Contracts		Contracts		Contracts		Total		Percent of Requirements
		Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	Number Contracts	Contract Volume	
MN Requirements			2,729,521		4,302,043		4,900,437		4,277,234		3,347,223		19,556,458	19,556,458
Daily Average			90,984		138,776		158,079		152,758		107,975		129,513	
	10%	Futures	272,952		430,204		490,044		427,723		334,722		1,955,646	
	20%	Call	545,904		860,409		980,087		855,447		669,445		3,911,292	
	30%	Storage	818,856		1,290,613		1,470,131		1,283,170		1,004,167		5,866,937	
	40%	Index	1,091,808		1,720,817		1,960,175		1,710,894		1,338,889		7,822,583	
Futures														
Contracts														
	May-18	5	50,000	8	80,000	9	90,000	7	70,000	6	60,000	35	350,000	
	Jun-18	5	50,000	7	70,000	8	80,000	7	70,000	6	60,000	33	330,000	
	Jul-18	5	50,000	7	70,000	8	80,000	7	70,000	6	60,000	33	330,000	
	Aug-18	4	40,000	7	70,000	8	80,000	7	70,000	5	50,000	31	310,000	
	Sep-18	4	40,000	7	70,000	8	80,000	7	70,000	5	50,000	31	310,000	
	Oct-18	4	40,000	7	70,000	8	80,000	7	70,000	5	50,000	31	310,000	
	Total	27	270,000	43	430,000	49	490,000	42	420,000	33	330,000	194	1,940,000	9.92%
Call Options														
	May-18	9	90,000	15	150,000	17	170,000	15	150,000	11	110,000	67	670,000	
	Jun-18	9	90,000	15	150,000	17	170,000	14	140,000	11	110,000	66	660,000	
	Jul-18	9	90,000	14	140,000	16	160,000	14	140,000	11	110,000	64	640,000	
	Aug-18	9	90,000	14	140,000	16	160,000	14	140,000	11	110,000	64	640,000	
	Sep-18	9	90,000	14	140,000	16	160,000	14	140,000	11	110,000	64	640,000	
	Oct-18	9	90,000	14	140,000	16	160,000	14	140,000	11	110,000	64	640,000	
	Total	54	540,000	86	860,000	98	980,000	85	850,000	66	660,000	389	3,890,000	19.89%
Collars														
	May-18	0	0	0	0	0	0	0	0	0	0	0	0	
	Jun-18	0	0	0	0	0	0	0	0	0	0	0	0	
	Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	
	Aug-18	0	0	0	0	0	0	0	0	0	0	0	0	
	Sep-18	0	0	0	0	0	0	0	0	0	0	0	0	
	Oct-18	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Index (back financial)														
	Total		810,000		1,290,000		1,470,000		1,270,000		990,000		5,830,000	29.81%
Physical Hedges			0		0		0		0		0		0	
Storage			635,634		1,597,234		1,597,234		1,597,234		635,634		6,062,969	31.00%
Prepaid Obl			0		0		0		0		0		0	0.00%
			53%		67%		63%		67%		49%		61%	60.81%
Term Index		0	0	0	0	0	0	0	0	0	0	0	0	0.00%
		0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Total NNG MN														
Futures													1,940,000	9.92%
Call Options													3,890,000	19.89%
Costing Collar													0	0.00%
Storage													6,062,969	31.00%
Prepaid Obl													0	0.00%
Term Index													0	0.00%
Month/Daily													7,663,489	39.19%
Total													19,556,458	100.00%

MINNESOTA ENERGY RESOURCES

**NNG WINTER PLAN
 NOVEMBER 2019 THROUGH MARCH 2020**

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

INDEX

<u>Contract Number</u>	<u>Date</u>	<u>Receipt Point</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Total</u>
77624	4/23/2019	NNG/GLGT Carlton	15,000	15,000	15,000	15,000	15,000	2,265,000
77626	4/23/2019	NNG/GLGT Grand Rapids	6,064	6,064	6,064	6,064	6,064	915,664
77627	4/23/2019	NNG-NBPL/NNG Ventura	5,000	5,000	5,000	5,000	5,000	755,000
77629	4/23/2019	NNG-NBPL/NNG Ventura		20,000	20,000	20,000		1,800,000
77633	4/23/2019	NNG-Field/Demarc	10,000	10,000	10,000	10,000	10,000	1,510,000
77637	4/23/2019	NNG-Field/Demarc	10,000	10,000	10,000	10,000	10,000	1,510,000
77634	4/23/2019	NNG-Field/Demarc	10,000	10,000	10,000	10,000	10,000	1,510,000
77635	4/23/2019	NNG-Field/Demarc	10,000	10,000	10,000	10,000	10,000	1,510,000
Total Actual Seasonal Index			66,064	86,064	86,064	86,064	66,064	11,775,664

GAS DAILY PACKAGES

Physical Call Option	75217	2/25/2019	NNG Ventura	40,000	40,000	40,000	40,000	40,000
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STORAGE

<u>Injection Month</u>	<u>K#118657 Volume Injected</u>	<u>K#132024 Volume Injected</u>	<u>K#133736 Volume Injected</u>	<u>Total Volume Injected</u>
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	5,019,321	500,000	1,000,000	6,519,321

MINNESOTA ENERGY RESOURCES - NNG

	2015-2016 NNG GS	2016-2017 NNG GS	2017-2018 NNG GS	2018-2019 NNG GS	2019-2020 NNG GS	Proposed Change
Design Day	259,076	262,324	267,783	273,842	277,376	3,534
Customer Requirements moving to Transportation						
Adjusted Design Day						
Design Day Percentages	32.40%	29.71%	30.43%	28.70%	25.04%	-3.66%
Total Design Day Capacity (includes non-recallable capacity)	266,317	266,317	266,317	277,256	314,349	37,093
Less: Windom	2,500	2,500	2,500	2,500	2,500	0
Less: Northwestern Energy	1,035	1,035	1,035	1,035	1,035	0
Total Design Day Capacity NNG Pipeline	262,782	262,782	262,782	273,721	310,814	37,093
Factors for All Winter Capacity	100.00%	100.00%	100.00%	100.00%	100.00%	
<u>Direct Assigned Entitlements in PGA</u>						
TF12B	48,183	48,183	54,419	51,706	51,780	74
TF12V	36,526	36,526	30,290	33,003	32,929	(74)
TF5	36,275	36,275	36,275	36,275	36,275	0
TFX12	32,297	32,297	32,297	48,236	85,329	37,093
TFX(5)	109,501	109,501	109,501	104,501	104,501	0
TFX(5) (12-V)						0
TFX (April Only)	2,000	2,000	2,000	2,000	2,000	0
TFX (October Only)	2,000	2,000	2,000	2,000	2,000	0
Windom	2,500	2,500	2,500	2,500	2,500	0
Northwestern Energy	1,035	1,035	1,035	1,035	1,035	0
NNG Zone Delivery Call Option	0	0	0	0	0	0
Bison *	50,000	50,000	50,000	50,000	50,000	0
NBPL *	50,000	50,000	50,000	50,000	50,000	0
Total Direct Assignments	266,317	266,317	266,317	277,256	314,349	37,093
LP Peak Shaving						0
Total Design Day Capacity	266,317	266,317	266,317	277,256	314,349	37,093
Total Annual Transportation	120,541	120,541	120,541	136,480	173,573	37,093
Total Seasonal Transportation	145,776	145,776	145,776	140,776	140,776	0
Total Percent Seasonal	54.7%	54.7%	54.7%	50.8%	44.8%	-6.0%
Reserve Margin	2.79%	1.52%	-0.55%	1.25%	13.33%	12.1%
Total Design Day Capacity w/ contract demand	266,317	266,317	266,317	277,256	314,349	37,093
Factors	32.40%	29.71%	30.43%	28.70%	25.04%	-3.66%
<u>Other Entitlements not included in Peak Day Deliverability</u>						
TFX Oct	2,000	2,000	2,000	2,000	2,000	0
TFX Apr	2,000	2,000	2,000	2,000	2,000	0
FDD Storage Reservation	100,934	107,871	113,075	113,075	113,075	0
FDD Storage Capacity	1,163,864	1,163,864	1,303,864	1,303,864	1,303,864	0
FDD Maximum Storage Quantity	5,819,321	6,219,321	6,519,321	6,519,321	6,519,321	0
SMS	24,380	24,380	22,680	22,680	22,680	0

MINNESOTA ENERGY RESOURCES - NNG

Change in Costs due to November 1, 2019 Change in Entitlement Levels and Related Demand Costs

Costs Assigned In Demand	Contract	2018/19	2019/20	Entitlement	Months	2019/20	2018/19	2019/20	Total Annual Cost Change
		Entitlements	Entitlements	Change		Rate	Total Annual Cost	Total Annual Cost	
TF12B (Max Rate) Winter	112495	46,506	46,580	74	5	\$10.2300	\$2,378,782	\$2,382,567	\$3,785
TF12B (Max Rate) Summer	112495	46,506	46,580	74	7	\$5.6830	\$1,850,055	\$1,852,999	\$2,944
TF12V (Max Rate)	112495	33,003	32,929	(74)	12	\$9.0926	\$3,600,997	\$3,592,923	(\$8,074)
TF5 (Max Rate)	112495	36,275	36,275	0	5	\$15.1530	\$2,748,375	\$2,748,375	\$0
TF12B (Discount-Winter)	112495	5,200	5,200	0	12	\$7.4951	\$467,694	\$467,694	\$0
TFX12 (Max Rate)	112486	16,261	10,822	(5,439)	12	\$9.6288	\$1,878,887	\$1,250,434	(\$628,453)
TFX Apr (Max Rate)	112486	2,000	2,000	0	1	\$5.6830	\$11,366	\$11,366	\$0
TFX Oct (Max Rate)	112486	2,000	2,000	0	1	\$5.6830	\$11,366	\$11,366	\$0
TFX5 (Max Rate)	112486	77,688	77,688	0	5	\$15.1530	\$5,886,031	\$5,886,031	\$0
TFX5 (Discount)	112486	1,800	1,800	0	5	\$10.0320	\$90,288	\$90,288	\$0
TFX12 (Discount)	111866	1,283	1,283	0	12	\$4.8640	\$74,886	\$74,886	\$0
TFX12 (Discount)	111866	8,271	8,271	0	12	\$5.4720	\$543,107	\$543,107	\$0
TFX12 (Discount)	111866	11,921	11,921	0	12	\$7.6025	\$1,087,553	\$1,087,553	\$0
TFX5 (Discount)	111866	379	379	0	5	\$4.8640	\$9,217	\$9,217	\$0
TFX5 (Discount)	111866	2,445	2,445	0	5	\$5.4720	\$66,895	\$66,895	\$0
TFX5 (Discount)	111866	22,189	22,189	0	5	\$15.1392	\$1,679,619	\$1,679,619	\$0
Windom		2,500	2,500	0	12	\$0.0000	\$0	\$0	\$0
Northwestern Energy		1,035	1,035	0	12	\$8.3382	\$103,560	\$103,560	\$0
Total Demand Cost							\$22,488,679	\$21,858,881	(\$629,798)

Costs Assigned In Commodity	2018/19	2019/20	Entitlement	Months	2019/20	2018/19	Entitlement	Entitlement	
	Entitlements	Entitlement	Change		Rate/Dth	Total Annual Cost	Total Cost	Change	
<u>Upstream</u>									
<u>Surcharges:</u>									
<u>Storage (FDD)</u>									
FDD - Reservation	118657	81,508	81,508	0	12 \$	1,7140	\$1,676,457	\$1,676,457	\$0
FDD - Storage Cycle	118657	939,864	939,864	0	5 \$	0.3567	\$1,676,248	\$1,676,248	\$0
FDD - Reservation	118657	5,550	5,550	0	12 \$	3.3157	\$220,826	\$220,826	\$0
FDD - Storage Cycle	118657	64,000	64,000	0	5 \$	0.6901	\$220,832	\$220,832	\$0
FDD - Reservation	133736	17,345	17,345	0	12 \$	1.7140	\$356,752	\$356,752	\$0
FDD - Storage Cycle	133736	200,000	200,000	0	5 \$	0.3567	\$356,700	\$356,700	\$0
FDD - Reservation	132024	8,672	8,672	0	12 \$	1.7140	\$178,366	\$178,366	\$0
FDD - Storage Cycle	132024	100,000	100,000	0	5 \$	0.3567	\$178,350	\$178,350	\$0
<u>Pipeline</u>									
Bison	FT0003	50,000	50,000	0	12	\$17.4896	\$10,493,750	\$10,493,750	\$0
NBPL	T8673F	50,000	50,000	0	12	\$6.3905	\$3,834,300	\$3,834,300	\$0
TFX12 (Rochester)	112486	10,500	10,500	0	12	\$37.1175	\$4,676,805	\$4,676,805	\$0
TFX12 (Rochester II)	112486	0	34,500	34,500	12	\$10.7714	\$0	\$4,459,360	\$4,459,360
TFX12 (SE MN Expansion)	112486	0	8,032	8,032	12	\$9.6288	\$0	\$928,062	\$928,062
SMS-Bal Service		272,160	272,160	0	1	\$2.1800	\$593,309	\$593,309	\$0
Physical Forward Start Premium							\$128,700	\$0	(\$128,700)
Financial Call Option Premium							\$378,446	\$168,419	(\$210,027)
Total Commodity Costs							\$24,969,839	\$30,018,534	\$5,048,695

MINNESOTA ENERGY RESOURCES - NNG

Daily Total Throughput Data - July 1, 2018 through June 30, 2019
 NNG

Design Day:

Base	6,734
Variable	2,641

Date	13.98% Cloquet Adjusted HDD	29.22% Minneapolis Adjusted HDD	45.15% Rochester Adjusted HDD	11.65% Worthington Adjusted HDD	100.00% Weighted Adjusted HDD	Actual Total Through- Put *	Estimated Firm Through- Put **
7/1/18	4	0	0	0	1	153,400	8,137
7/2/18	0	0	0	0	0	158,144	6,734
7/3/18	0	0	0	0	0	158,076	6,734
7/4/18	0	0	0	0	0	148,516	6,734
7/5/18	2	0	0	0	0	164,949	7,325
7/6/18	0	0	0	0	0	148,088	6,734
7/7/18	0	0	0	0	0	133,834	6,734
7/8/18	0	0	0	0	0	139,828	6,734
7/9/18	0	0	0	0	0	171,141	6,734
7/10/18	0	0	0	0	0	163,202	6,734
7/11/18	0	0	0	0	0	160,018	6,734
7/12/18	0	0	0	0	0	173,884	6,734
7/13/18	0	0	0	0	0	171,112	6,734
7/14/18	0	0	0	0	0	156,175	6,734
7/15/18	0	0	0	0	0	163,632	6,734
7/16/18	1	0	0	0	0	175,846	6,919
7/17/18	4	0	0	0	1	180,515	8,063
7/18/18	0	0	0	0	0	162,721	6,734
7/19/18	0	0	0	0	0	140,340	6,734
7/20/18	0	0	0	0	0	162,793	6,734
7/21/18	0	0	0	0	0	137,855	6,734
7/22/18	3	0	0	0	0	153,671	7,879
7/23/18	0	0	0	0	0	167,603	6,734
7/24/18	0	0	0	0	0	167,423	6,734
7/25/18	0	0	0	0	0	153,685	6,734
7/26/18	11	1	4	4	4	149,506	17,785
7/27/18	3	0	2	3	1	161,048	10,586
7/28/18	0	0	0	1	0	151,485	6,888
7/29/18	0	0	0	0	0	159,328	6,734
7/30/18	0	0	0	0	0	172,497	6,734
7/31/18	0	0	0	0	0	171,944	6,734
8/1/18	7	0	0	6	2	166,210	11,275
8/2/18	8	0	3	0	3	158,142	13,540
8/3/18	3	0	0	0	0	149,225	7,731
8/4/18	0	0	0	0	0	125,345	6,734
8/5/18	0	0	0	0	0	157,562	6,734

Minnesota Energy Resources Corporation
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8/6/18	4	0	0	0	1	159,528	8,100
8/7/18	0	0	2	0	1	155,864	8,642
8/8/18	0	0	0	0	0	161,897	6,734
8/9/18	0	0	0	0	0	172,733	6,734
8/10/18	0	0	0	0	0	171,416	6,734
8/11/18	0	0	0	0	0	141,454	6,734
8/12/18	0	0	0	0	0	149,350	6,734
8/13/18	0	0	0	0	0	169,570	6,734
8/14/18	0	0	0	0	0	168,995	6,734
8/15/18	0	0	0	0	0	163,580	6,734
8/16/18	0	0	0	0	0	159,430	6,734
8/17/18	0	0	0	0	0	140,654	6,734
8/18/18	0	0	0	0	0	131,844	6,734
8/19/18	0	0	0	0	0	126,654	6,734
8/20/18	4	0	0	1	1	117,218	8,285
8/21/18	5	0	6	6	4	120,334	17,095
8/22/18	0	0	1	1	0	124,750	7,484
8/23/18	0	0	0	0	0	120,825	6,734
8/24/18	2	0	0	0	0	119,054	7,288
8/25/18	0	0	0	0	0	117,009	6,734
8/26/18	0	0	0	0	0	120,798	6,734
8/27/18	0	0	0	0	0	149,400	6,734
8/28/18	14	6	5	11	7	153,458	25,724
8/29/18	7	2	6	2	4	165,918	18,538
8/30/18	2	0	0	0	0	149,920	7,325
8/31/18	0	0	0	0	0	145,179	6,734
9/1/18	0	0	0	0	0	147,511	6,734
9/2/18	5	0	0	0	1	151,612	8,506
9/3/18	0	0	0	0	0	157,083	6,734
9/4/18	2	0	0	0	0	170,990	7,325
9/5/18	14	3	6	6	6	150,371	22,965
9/6/18	6	0	3	3	3	151,201	13,602
9/7/18	3	0	5	5	3	141,113	15,167
9/8/18	10	1	7	4	5	131,142	20,763
9/9/18	8	2	7	3	5	133,876	19,682
9/10/18	2	0	0	0	0	145,363	7,325
9/11/18	0	0	0	0	0	136,431	6,734
9/12/18	0	0	0	0	0	155,159	6,734
9/13/18	0	0	0	0	0	150,375	6,734
9/14/18	0	0	0	0	0	178,434	6,734
9/15/18	2	0	0	0	0	163,707	7,325
9/16/18	0	0	0	0	0	156,297	6,734
9/17/18	8	0	0	0	1	170,441	9,651
9/18/18	13	2	1	0	3	158,796	13,787
9/19/18	12	4	1	3	4	156,282	16,313
9/20/18	14	7	1	6	5	140,431	19,795
9/21/18	20	14	19	19	18	152,727	53,732
9/22/18	12	7	9	8	9	146,019	29,926

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9/23/18	17	0	3	0	4	150,723	16,946
9/24/18	9	1	0	7	2	174,982	12,661
9/25/18	23	16	16	19	17	181,293	52,801
9/26/18	17	12	12	12	13	165,266	40,535
9/27/18	20	14	14	13	15	178,862	45,474
9/28/18	27	20	22	23	22	197,581	65,679
9/29/18	27	22	24	24	24	193,654	69,564
9/30/18	20	17	18	19	18	191,010	54,700
10/1/18	21	18	18	20	19	215,849	56,583
10/2/18	17	12	8	9	11	196,543	34,732
10/3/18	25	9	8	9	11	189,233	35,653
10/4/18	26	23	25	28	25	242,916	72,425
10/5/18	26	19	18	23	20	231,208	59,110
10/6/18	26	22	22	27	23	219,061	67,666
10/7/18	24	18	19	22	20	209,262	59,161
10/8/18	21	15	11	20	14	206,163	44,426
10/9/18	27	21	8	27	16	200,225	50,049
10/10/18	34	25	19	35	25	195,059	72,382
10/11/18	38	34	37	38	36	247,580	101,843
10/12/18	35	28	32	32	31	237,664	88,970
10/13/18	28	22	25	27	25	201,892	71,525
10/14/18	35	34	38	41	37	235,642	103,362
10/15/18	33	29	32	35	31	223,628	89,440
10/16/18	33	22	22	24	24	215,920	69,794
10/17/18	34	25	29	24	28	235,980	80,734
10/18/18	16	10	14	9	13	180,389	40,345
10/19/18	25	18	17	18	19	189,195	55,810
10/20/18	37	32	38	35	36	232,712	100,496
10/21/18	28	20	25	20	23	228,967	68,174
10/22/18	25	21	22	22	22	239,265	64,886
10/23/18	32	26	29	26	28	255,662	81,245
10/24/18	25	22	26	22	24	228,311	70,675
10/25/18	23	16	21	20	20	240,190	58,921
10/26/18	22	19	20	20	20	236,052	60,349
10/27/18	23	18	20	18	20	210,005	58,705
10/28/18	24	21	26	24	24	216,710	69,650
10/29/18	27	21	23	20	23	231,441	66,353
10/30/18	26	21	24	24	23	241,995	68,454
10/31/18	32	22	24	26	25	261,678	72,794
11/1/18	32	24	24	21	25	259,503	72,522
11/2/18	35	26	26	25	27	250,503	78,714
11/3/18	32	26	30	29	29	231,641	82,551
11/4/18	32	30	31	31	31	222,338	88,497
11/5/18	30	25	27	31	27	218,263	78,668
11/6/18	36	36	38	45	38	252,510	106,765
11/7/18	45	41	45	44	44	301,805	122,291
11/8/18	50	45	47	48	47	310,964	130,454
11/9/18	57	54	60	61	58	314,251	160,323

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11/10/18	50	47	51	50	49	296,241	137,253
11/11/18	48	46	48	49	48	293,168	132,220
11/12/18	61	56	59	59	59	343,331	161,590
11/13/18	56	51	54	44	52	334,091	144,672
11/14/18	43	36	38	33	38	271,211	106,274
11/15/18	38	32	36	32	35	262,956	97,942
11/16/18	49	42	45	49	45	276,845	125,140
11/17/18	56	52	61	63	58	303,840	158,675
11/18/18	49	50	57	48	53	286,536	146,330
11/19/18	64	49	50	59	53	308,512	146,036
11/20/18	53	46	47	39	47	290,213	129,870
11/21/18	54	44	45	41	45	290,236	126,845
11/22/18	41	34	38	31	37	246,100	103,350
11/23/18	27	26	30	31	29	220,962	82,030
11/24/18	43	39	41	46	41	248,276	116,282
11/25/18	55	49	53	61	53	295,228	146,876
11/26/18	57	52	58	60	57	331,376	155,965
11/27/18	54	49	53	50	51	309,689	142,665
11/28/18	49	46	48	46	47	299,943	131,876
11/29/18	40	38	40	38	40	268,045	111,059
11/30/18	38	39	40	41	39	249,534	110,595
12/1/18	42	40	43	47	43	251,979	119,008
12/2/18	45	41	43	49	44	255,625	122,022
12/3/18	50	43	45	48	45	275,526	126,691
12/4/18	47	43	48	50	47	284,179	130,765
12/5/18	48	45	55	48	50	289,196	139,602
12/6/18	61	56	64	60	61	328,173	167,016
12/7/18	55	49	53	54	52	316,406	144,194
12/8/18	52	48	54	56	52	297,888	143,991
12/9/18	46	46	53	49	50	299,666	138,053
12/10/18	51	49	56	52	53	320,705	146,251
12/11/18	49	47	51	47	49	294,211	136,617
12/12/18	40	41	46	39	43	284,266	119,894
12/13/18	44	39	43	39	42	283,664	116,973
12/14/18	33	37	45	38	40	273,310	112,501
12/15/18	33	35	41	35	37	248,925	104,858
12/16/18	40	33	41	36	38	260,081	107,586
12/17/18	44	36	43	40	41	276,873	113,998
12/18/18	36	29	34	32	32	251,991	92,460
12/19/18	34	29	34	34	33	243,553	92,884
12/20/18	46	40	42	46	43	281,350	119,185
12/21/18	51	43	45	44	45	290,594	126,504
12/22/18	43	39	42	39	41	275,245	114,948
12/23/18	51	49	53	47	51	297,745	141,310
12/24/18	47	46	49	43	47	286,381	131,455
12/25/18	48	41	37	41	40	270,744	113,378
12/26/18	48	39	40	40	41	270,282	114,846
12/27/18	46	40	37	57	41	261,656	115,891

Minnesota Energy Resources Corporation
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12/28/18	69	55	53	75	58	322,582	159,957
12/29/18	62	54	59	65	59	321,861	161,728
12/30/18	46	41	45	43	44	277,534	122,609
12/31/18	67	58	56	69	60	325,221	164,037
1/1/19	71	62	61	71	64	355,996	175,941
1/2/19	59	48	52	53	52	319,871	144,433
1/3/19	38	34	39	40	38	266,750	105,908
1/4/19	35	29	33	34	32	250,493	90,877
1/5/19	45	32	33	33	34	247,984	97,412
1/6/19	43	35	37	38	37	254,275	105,723
1/7/19	39	32	33	34	34	255,268	95,470
1/8/19	63	56	58	57	58	328,658	160,048
1/9/19	64	59	61	60	60	347,021	166,448
1/10/19	56	50	51	49	51	318,560	142,379
1/11/19	47	41	43	42	43	284,272	119,317
1/12/19	41	41	40	45	41	263,909	114,997
1/13/19	40	36	42	40	39	258,072	110,937
1/14/19	49	38	41	42	42	273,382	116,429
1/15/19	62	51	51	59	53	292,619	147,534
1/16/19	66	52	50	57	54	309,610	149,137
1/17/19	68	52	54	53	55	324,526	152,442
1/18/19	77	67	67	76	70	352,251	190,722
1/19/19	78	68	73	78	73	355,126	198,791
1/20/19	72	66	76	77	73	360,210	198,350
1/21/19	64	63	70	64	66	343,064	181,487
1/22/19	57	53	54	61	55	317,462	151,774
1/23/19	56	54	58	60	56	312,169	155,950
1/24/19	80	76	79	81	79	386,669	214,289
1/25/19	85	69	75	70	74	386,851	201,496
1/26/19	83	68	76	67	74	374,718	201,055
1/27/19	82	75	79	69	77	356,533	210,415
1/28/19	75	71	76	83	75	374,200	205,422
1/29/19	104	97	101	101	100	457,369	271,362
1/30/19	97	91	98	87	95	460,432	256,547
1/31/19	84	79	86	74	82	418,104	223,527
2/1/19	64	60	58	53	59	331,114	161,282
2/2/19	52	39	33	36	38	252,666	106,655
2/3/19	47	36	37	61	41	252,543	114,794
2/4/19	67	60	65	77	65	355,190	178,514
2/5/19	64	60	58	71	61	353,481	166,728
2/6/19	54	50	50	71	53	327,786	147,393
2/7/19	72	71	79	89	77	390,426	209,322
2/8/19	80	76	82	76	79	422,899	215,856
2/9/19	70	70	69	66	69	359,416	188,867
2/10/19	57	53	51	57	53	323,142	146,505
2/11/19	53	47	49	50	49	306,749	136,499
2/12/19	54	58	65	69	62	322,722	169,546
2/13/19	51	56	59	55	57	311,217	156,245

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2/14/19	65	63	67	75	67	348,594	182,398
2/15/19	65	62	72	67	67	357,510	184,055
2/16/19	59	57	59	60	58	318,766	161,211
2/17/19	61	55	59	63	59	317,168	161,342
2/18/19	63	59	65	63	63	342,784	172,646
2/19/19	58	58	61	61	59	322,635	163,632
2/20/19	50	52	57	59	54	321,122	150,575
2/21/19	48	54	60	56	56	320,890	154,099
2/22/19	50	48	51	48	50	281,021	137,704
2/23/19	45	48	51	58	50	279,237	139,515
2/24/19	76	70	77	76	75	356,657	204,108
2/25/19	75	70	73	78	73	380,832	199,567
2/26/19	66	65	68	71	67	367,962	184,108
2/27/19	68	64	73	68	69	359,100	188,301
2/28/19	59	56	62	57	59	349,952	163,041
3/1/19	60	56	56	62	57	340,221	158,183
3/2/19	74	69	74	78	73	333,993	200,281
3/3/19	79	78	85	86	82	398,930	224,421
3/4/19	72	70	79	75	75	368,821	204,150
3/5/19	68	60	69	65	66	348,018	181,259
3/6/19	66	56	63	57	60	328,845	166,510
3/7/19	56	53	57	58	56	314,821	153,539
3/8/19	43	42	46	45	44	268,161	123,069
3/9/19	37	39	42	48	41	253,528	115,232
3/10/19	54	50	55	49	53	295,608	145,516
3/11/19	49	46	50	42	48	283,326	132,490
3/12/19	38	38	39	34	38	255,626	106,430
3/13/19	31	29	31	32	31	235,734	87,573
3/14/19	36	35	36	48	37	252,087	104,556
3/15/19	44	43	47	44	45	265,619	125,557
3/16/19	44	39	43	39	41	254,429	116,208
3/17/19	39	35	42	39	39	254,185	109,661
3/18/19	36	33	39	35	36	241,037	102,739
3/19/19	32	28	33	32	31	221,366	89,579
3/20/19	33	28	34	35	32	229,892	91,745
3/21/19	26	28	32	31	30	215,284	85,284
3/22/19	37	28	32	29	31	222,735	88,205
3/23/19	26	23	27	23	25	204,061	73,416
3/24/19	47	27	28	30	31	235,472	87,767
3/25/19	37	30	31	35	32	281,136	91,143
3/26/19	31	27	29	28	28	228,766	81,251
3/27/19	23	18	20	19	19	204,832	58,213
3/28/19	37	27	29	31	30	233,742	85,311
3/29/19	38	30	31	37	32	233,145	91,263
3/30/19	45	40	44	46	43	261,142	121,176
3/31/19	39	36	37	31	36	260,942	102,749
4/1/19	33	30	35	37	33	264,240	95,151
4/2/19	34	28	31	30	30	255,779	87,200

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4/3/19	35	25	24	26	26	234,423	75,306
4/4/19	33	28	30	28	29	263,076	84,448
4/5/19	26	22	22	15	22	229,714	64,784
4/6/19	28	16	10	11	14	202,616	43,626
4/7/19	25	13	16	12	16	215,405	49,448
4/8/19	22	12	15	15	15	211,660	46,789
4/9/19	37	25	22	25	26	238,943	74,206
4/10/19	42	41	43	45	42	278,755	118,219
4/11/19	45	39	39	39	40	293,445	111,906
4/12/19	36	36	41	44	39	281,809	109,739
4/13/19	41	35	37	39	37	270,967	104,438
4/14/19	35	28	34	32	32	249,271	91,772
4/15/19	30	21	22	16	22	226,072	64,258
4/16/19	15	8	10	13	10	199,744	33,946
4/17/19	26	21	22	23	22	226,785	65,775
4/18/19	27	23	26	26	25	232,025	73,142
4/19/19	15	12	18	15	15	200,851	47,343
4/20/19	7	0	4	0	3	156,715	13,904
4/21/19	24	5	0	4	5	175,233	20,681
4/22/19	30	26	19	29	24	229,375	69,280
4/23/19	16	11	15	11	13	218,283	41,999
4/24/19	7	1	7	2	4	206,370	18,373
4/25/19	13	9	14	14	12	192,551	39,326
4/26/19	26	16	20	24	20	201,936	59,833
4/27/19	28	23	36	32	31	206,933	87,538
4/28/19	24	20	25	29	24	198,946	69,843
4/29/19	33	19	18	22	21	221,271	61,502
4/30/19	32	26	27	27	28	242,173	79,425
5/1/19	32	23	24	25	25	237,765	71,727
5/2/19	29	20	23	21	23	224,324	66,928
5/3/19	20	12	18	13	16	190,401	49,274
5/4/19	11	6	12	10	10	163,052	32,048
5/5/19	23	11	11	14	13	166,216	40,641
5/6/19	26	18	14	21	18	188,393	53,649
5/7/19	20	10	16	15	14	175,112	44,987
5/8/19	28	27	30	34	29	207,135	84,132
5/9/19	26	22	27	28	25	204,294	73,935
5/10/19	18	15	17	17	16	172,896	49,943
5/11/19	15	13	20	15	17	176,586	50,369
5/12/19	17	12	18	20	16	185,616	50,130
5/13/19	10	8	12	8	10	179,474	33,661
5/14/19	9	2	10	3	7	171,925	24,493
5/15/19	15	0	0	0	2	170,844	12,383
5/16/19	16	0	0	1	2	176,917	12,937
5/17/19	21	9	16	10	14	164,937	43,594
5/18/19	30	20	12	8	16	185,020	50,258
5/19/19	29	27	28	29	28	197,791	80,065
5/20/19	16	11	16	16	14	174,944	44,448

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5/21/19	14	13	20	22	17	180,847	52,666
5/22/19	19	9	9	16	11	165,968	35,339
5/23/19	15	11	11	12	11	174,858	37,085
5/24/19	18	3	3	4	5	157,083	20,598
5/25/19	15	8	6	10	8	147,969	28,432
5/26/19	7	1	1	0	2	144,829	10,723
5/27/19	25	17	12	14	15	162,699	47,078
5/28/19	11	9	11	12	11	159,503	34,536
5/29/19	3	1	4	9	3	156,552	15,199
5/30/19	13	0	0	0	2	153,773	11,571
5/31/19	5	0	0	0	1	164,921	8,506
6/1/19	12	3	7	8	7	139,924	24,194
6/2/19	11	0	3	0	3	131,335	13,978
6/3/19	11	0	0	0	2	135,863	10,832
6/4/19	3	0	0	0	0	154,587	7,915
6/5/19	16	0	0	0	2	167,706	12,789
6/6/19	1	0	0	0	0	162,555	6,919
6/7/19	5	0	0	0	1	145,438	8,691
6/8/19	0	0	0	0	0	123,688	6,734
6/9/19	9	4	3	7	5	125,139	19,203
6/10/19	11	0	2	0	2	133,259	12,851
6/11/19	8	4	7	7	6	124,180	22,170
6/12/19	16	6	10	12	10	127,058	33,039
6/13/19	5	0	2	0	2	141,037	11,277
6/14/19	5	0	0	0	1	129,782	8,506
6/15/19	11	0	1	0	2	124,614	11,207
6/16/19	12	0	5	0	4	151,076	17,595
6/17/19	8	0	0	0	1	170,279	9,762
6/18/19	9	0	1	3	2	158,521	12,240
6/19/19	3	0	0	0	0	148,600	7,915
6/20/19	3	0	2	0	1	132,385	10,539
6/21/19	9	0	5	1	3	128,159	15,650
6/22/19	8	0	0	0	1	114,613	9,503
6/23/19	9	0	0	4	2	137,224	11,183
6/24/19	3	0	2	0	1	145,120	10,354
6/25/19	0	0	0	0	0	146,448	6,734
6/26/19	0	0	0	0	0	151,542	6,734
6/27/19	1	0	0	0	0	147,691	7,103
6/28/19	0	0	0	0	0	145,318	6,734
6/29/19	0	0	0	0	0	138,029	6,734
6/30/19	0	0	0	0	0	143,417	6,734
Totals	10,672	8,939	9,707	9,827	9,632	82,744,333	27,895,005

* Volumes include interruptible and transportation volumes

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

MINNESOTA ENERGY RESOURCES - NNG

Customer Counts by PGAC Class - July 1, 2018 through June 30, 2019

Tariff Rate Class	Rate Designation	Jul-18 Average Customers	Aug-18 Average Customers	Sep-18 Average Customers	Oct-18 Average Customers	Nov-18 Average Customers	Dec-18 Average Customers	Jan-19 Average Customers	Feb-19 Average Customers	Mar-19 Average Customers	Apr-19 Average Customers	May-19 Average Customers	Jun-19 Average Customers	Annual Average Customers
GS- Residential	MERC000001	172,694	172,762	172,921	173,195	173,814	172,550	177,209	174,486	174,348	174,449	175,296	174,922	174,054
GS-C&I <1,500 therms/yr (Small)	MERC000005	7,319	7,310	7,329	7,301	7,284	7,296	7,514	7,235	6,648	6,647	6,692	6,679	7,104
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	9,128	9,091	9,151	9,119	9,190	9,119	9,490	9,338	9,933	9,951	9,947	9,949	9,450
GS-C&I >1,500 therms/yr (Large) Emmons, IA	MERC000014	2	2	2	2	2	2	2	2	2	2	2	2	2
Small Volume Interruptible (SVI)	MERC000015	259	258	255	246	270	271	269	262	259	260	257	258	260
Small Volume Interruptible w/Joint (SVJ)	MERC000019	2	2	2	2	3	3	2	2	2	2	3	3	2
Large Volume Interruptible (LVI)	MERC000022	58	59	60	58	70	58	67	62	59	62	63	61	61
Large Volume Interruptible w/Joint (LVJ)	MERC000026	8	-1	9	9	-5	-62	0	0	0	0	0	1	-3
	MERC000101	9,398	9,379	9,349	9,333	9,377	9,122	9,674	9,380	9,368	9,395	9,384	9,386	9,379
	MERC000102	584	577	575	571	579	567	581	578	548	555	559	549	569
	MERC000103	586	583	583	590	607	574	606	590	618	623	617	621	600
	MERC000104	32	34	22	35	40	30	34	32	32	31	32	33	32
	MERC000106	14	14	25	16	14	13	13	13	13	12	12	12	14
Total		200,072	200,057	200,258	200,461	201,232	199,530	205,449	201,970	201,818	201,977	202,854	202,465	201,512

MINNESOTA ENERGY RESOURCES - NNG
 Projected Fixed Cost - November 2019 through March 2020

Futures Contracts WACOG

10,000 Dth/contract											Dec-19											Jan-20																
Deal Number	Purchase Date	Trade Number	Number Contracts	Physical Volume	Strike Price	Strike Cost	LDS Settle*	LDS Settle Cost	Over/(Under) Market	Premium Per Unit	Premium Cost	Total Cost	Deal Number	Purchase Date	Trade Number	Number Contracts	Physical Volume	Strike Price	Strike Cost	LDS Settle*	LDS Settle Cost	Over/(Under) Market	Premium Per Unit	Premium Cost	Total Cost	Deal Number	Purchase Date	Trade Number	Number Contracts	Physical Volume	Strike Price	Strike Cost	LDS Settle*	LDS Settle Cost	Over/(Under) Market	Premium Per Unit	Premium Cost	Total Cost
1	06/02/19	77877	6	60,000	\$ 2,740	\$ 164,820	\$ 2,510	\$ 150,600	\$ 14,220	\$ -	\$ 164,820		1	05/14/19	78110	10	100,000	\$ 2,950	\$ 295,900	\$ 2,680	\$ 268,500	\$ 27,400	\$ -	\$ 295,900		1	05/18/19	78173	11	110,000	\$ 3,020	\$ 333,190	\$ 2,790	\$ 307,010	\$ 26,180	\$ -	\$ 333,190	
2	06/04/19	78835	6	60,000	\$ 2,540	\$ 152,400	\$ 2,510	\$ 150,600	\$ 1,800	\$ -	\$ 152,400		2	06/13/19	78844	9	90,000	\$ 2,630	\$ 236,770	\$ 2,680	\$ 241,650	\$ (2,880)	\$ -	\$ 236,770		2	05/18/19	78910	10	100,000	\$ 2,720	\$ 277,200	\$ 2,790	\$ 279,100	\$ (1,900)	\$ -	\$ 277,200	
3	07/02/19	78220	6	60,000	\$ 2,370	\$ 142,380	\$ 2,510	\$ 150,600	\$ (8,220)	\$ -	\$ 142,380		3			4		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		3			4		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
4					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		4			5		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		4			5		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
5					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		5			6		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		5			6		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
6					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		6			7		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		6			7		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
7					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		7			8		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		7			8		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
8					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		8			9		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		8			9		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
9					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		9			10		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		9			10		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
10					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		10			11		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		10			11		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
11					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		11			12		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		11			12		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
12					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		12			13		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		12			13		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
13					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		13			14		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		13			14		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
14					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		14			15		\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		14			15		\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
15					\$ -	\$ -	\$ 2,510	\$ -	\$ -	\$ -	\$ -		15					\$ -	\$ -	\$ 2,680	\$ -	\$ -	\$ -	\$ -	\$ -		15					\$ -	\$ -	\$ 2,790	\$ -	\$ -	\$ -	\$ -
Total			18	180,000	\$ 459,600	\$ 2,553	\$ 2,510	\$ 451,800	\$ 7,800	\$ -	\$ 459,600		Total			19	190,000	\$ 534,670	\$ 2,814	\$ 534,670	\$ 24,520	\$ -	\$ 534,670		Total	Total		21	210,000	\$ 610,390	\$ 2,906	\$ 586,110	\$ 24,280	\$ -	\$ 610,390			
Other-Cons	27	84.38%	15	151,875	\$ 2,553	\$ 387,788	\$ 2,510	\$ 381,206	\$ 6,581	\$ -	\$ 387,788		Other-Cons	43	82.69%	16	157,115	\$ 2,814	\$ 442,131	\$ 2,680	\$ 421,855	\$ 20,276	\$ -	\$ 442,131		Other-Cons	49	84.48%	18	177,414	\$ 2,906	\$ 515,674	\$ 2,790	\$ 495,162	\$ 20,512	\$ -	\$ 515,674	
Other-Cons	5	15.63%	3	28,125	\$ 2,553	\$ 71,813	\$ 2,510	\$ 70,584	\$ 1,219	\$ -	\$ 71,813		Other-Cons	9	17.31%	3	32,855	\$ 2,814	\$ 92,539	\$ 2,680	\$ 88,295	\$ 4,244	\$ -	\$ 92,539		Other-Cons	9	15.52%	3	32,586	\$ 2,906	\$ 94,716	\$ 2,790	\$ 90,948	\$ 3,768	\$ -	\$ 94,716	
Total	32	100.0%	18	180,000	\$ 2,553	\$ 459,600	\$ 2,510	\$ 451,800	\$ 7,800	\$ -	\$ 459,600		Total	52	100.0%	19	190,000	\$ 2,814	\$ 534,670	\$ 2,680	\$ 510,150	\$ 24,520	\$ -	\$ 534,670		Total	58	100.0%	21	210,000	\$ 2,906	\$ 610,390	\$ 2,790	\$ 586,110	\$ 24,280	\$ -	\$ 610,390	

*Prices from 7/15/19 NYMEX market

MINNESOTA ENERGY RESOURCES - NNG

Projected Storage Cost - November 2019 through March 2020

Month/ Year	K#118657 NNG Storage (Dth)	LS Power K#132024 NNG Storage (Dth)	LS Power K#133736 NNG Storage (Dth)	Total NNG Storage (Dth)	Projected NNG WACOG	K#118657 NNG Storage Cost	K#132024 NNG Storage Cost	K#133736 NNG Storage Cost	Total NNG Storage Cost	ANR Storage GLGT/VGT (Dth)	ANR Storage GLGT/VGT WACOG	ANR Storage GLGT/VGT Cost
Nov-19	489,384	48,750	97,500	635,634	\$ 2.5729	\$ 1,259,154	\$ 125,431	\$ 250,861	\$ 1,635,446	96,000	\$ 2.8102	\$ 269,779
Dec-19	1,229,734	122,500	245,000	1,597,234	\$ 2.5729	\$ 3,164,028	\$ 315,185	\$ 630,370	\$ 4,109,582	189,100	\$ 2.8102	\$ 531,408
Jan-20	1,229,734	122,500	245,000	1,597,234	\$ 2.5729	\$ 3,164,028	\$ 315,185	\$ 630,370	\$ 4,109,582	189,100	\$ 2.8102	\$ 531,408
Feb-20	1,229,734	122,500	245,000	1,597,234	\$ 2.5729	\$ 3,164,028	\$ 315,185	\$ 630,370	\$ 4,109,582	196,000	\$ 2.8102	\$ 550,799
Mar-20	489,384	48,750	97,500	635,634	\$ 2.5729	\$ 1,259,154	\$ 125,431	\$ 250,861	\$ 1,635,446	85,900	\$ 2.8102	\$ 241,396
Total	4,667,969	465,000	930,000	6,062,969		\$ 12,010,391	\$ 1,196,416	\$ 2,392,832	\$ 15,599,639	756,100		\$ 2,124,790

Month/ Year	NNG Storage Volume (Dth)	NNG Index Price	NNG Index Cost	Month/ Year	ANR Storage Volume (Dth)	Emerson Index Price	Emerson Market Cost
Nov-19	635,634	\$ 2.4275	\$ 1,543,001	Nov-19	96,000	\$ 2.3975	\$ 230,160
Dec-19	1,597,234	\$ 3.2905	\$ 5,255,697	Dec-19	189,100	\$ 2.8330	\$ 535,720
Jan-20	1,597,234	\$ 3.5985	\$ 5,747,645	Jan-20	189,100	\$ 2.9710	\$ 561,816
Feb-20	1,597,234	\$ 3.5490	\$ 5,668,582	Feb-20	196,000	\$ 2.9440	\$ 577,024
Mar-20	635,634	\$ 2.6135	\$ 1,661,229	Mar-20	85,900	\$ 2.7260	\$ 234,163
Total	6,062,969		\$ 19,876,155	Total	756,100		\$ 2,138,884
Storage Savings (Cost):			\$ 4,276,516				\$ 14,093

*Indexes and projected WACOG based on 7/15/19 market prices

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**Attachment 12: Forecast Methodology for MERC Demand Entitlement
 Effective November 1, 2019**

1. Peak-day

a. Purpose

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

b. Background

MERC customers are served by four 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 nine demand areas:

	Pipeline	PGA	Weather Station(s)
1	Centra	MERC Consolidated	International Falls
2	Great Lakes Gas Transmission (GLGT)	MERC Consolidated	Bemidji
3	GLGT	MERC Consolidated	Cloquet
4	Viking Gas Transmission (VGT)	MERC Consolidated	Fargo
5	NNG	MERC NNG	Cloquet
6	NNG	MERC NNG	Minneapolis
7	NNG	MERC NNG	Ortonville

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. MERC now submits only two demand entitlement petitions (NNG and Consolidated) for each heating season.

	Pipeline	PGA	Weather Station(s)
8	NNG	MERC NNG	Rochester
9	NNG	MERC NNG	Worthington

2. Analytical Approach

a. Summary

1. Obtain daily weather data for each weather station.
2. Obtain daily total throughput volumes by pipeline and by weather station.
3. Obtain daily large volume transportation, interruptible, and joint interruptible volumes by pipeline and by weather station (Data A).
4. Obtain daily small volume interruptible volumes by pipeline and by weather station (Data B).
5. Calculate daily “firm” volumes by subtracting both Data A and Data B from total throughput volumes.
6. Perform quality control on volumetric data (e.g., identify missing or bad reads, and, to the extent possible, fix missing or bad reads).
7. Perform firm peak day regressions. In response to comments from the Minnesota Department of Commerce, 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. Process

The Peak Day Process consisted of:

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

- i. The **Data Preparation** consisted of:
- Identify the coldest Adjusted Heating Degree Day (AHDD) since January 1996 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).
 - 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) since January 1996. Many weather stations experienced historically cold weather in the January/February 1996 time period; without inclusion of that additional data from January/February 1996, AHDD65 were materially lower and not reflective of MERC’s capacity needs. The coldest AHDD65 data since 1996 is included in the table below, along with the AHDD65 conditions on the day prior (“AHDD65-1”).

<u>Station</u>	<u>Date</u>	<u>Avg. Temp</u>	<u>Avg. Wind</u>	<u>HDD65</u>	<u>AHDD65</u>	<u>AHDD65-1</u>
Bemidji	1/29/2019	-32	14	97	110	84
Cloquet	1/29/2019	-24	16	89	103	74
Fargo	1/18/1996	-16	34	81	109	85
International Falls	2/2/1996	-34	8	99	107	107
Minneapolis	1/29/2019	-20	17	85	100	71
Rochester	1/29/2019	-20	21	85	104	76
Worthington	1/29/2019	-20	21	85	103	81
Ortonville	1/29/2019	-23	14	88	101	77

This data by weather station was then compared to the AHDD65 data used in the previous demand entitlement filing:

<u>Station</u>	<u>Date</u>	<u>Avg. Temp</u>	<u>Avg. Wind</u>	<u>HDD65</u>	<u>AHDD65</u>	<u>AHDD65-1</u>
Bemidji	2/1/1996	-34	8	99	107	94
Cloquet	2/2/1996	-31	7	96	103	100
Fargo	1/18/1996	-16	34	81	109	85
International Falls	2/2/1996	-34	8	99	107	107
Minneapolis	2/2/1996	-25	8	90	97	92
Rochester	2/2/1996	-27	10	92	101	94
Worthington	1/18/1996	-8	32	73	96	74
Ortonville	1/14/2009	-21	11	86	96	86

While the January, 2019 cold weather outbreak was significant, it was not considered to be as severe as the weather conditions experienced in 1996. With the exception of Worthington, the 1996 weather conditions overall were colder when considering both the current day and the prior day weather conditions. Following is the data by weather station that was ultimately used in MERC’s current analysis:

<u>Station</u>	<u>Date</u>	<u>Avg. Temp</u>	<u>Avg. Wind</u>	<u>HDD65</u>	<u>AHDD65</u>	<u>AHDD65-1</u>
Bemidji	2/1/1996	-34	8	99	107	94
Cloquet	2/2/1996	-31	7	96	103	100
Fargo	1/18/1996	-16	34	81	109	85
International Falls	2/2/1996	-34	8	99	107	107
Minneapolis	2/2/1996	-25	8	90	97	92
Rochester	2/2/1996	-27	10	92	101	94
Worthington	1/29/2019	-20	21	85	103	81
Ortonville	1/14/2009	-21	11	86	96	86

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

- For each of the pipelines and weather stations:
 1. Gather the net daily metered volumes and weather station data including AHDD65.²
 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.
 4. In response to comments from the Department, the regression methodology incorporates a process to mitigate the impact of autocorrelation. See section below on autocorrelation.

² Temperature and weather data were obtained from DTN (formerly Schneider Electric) via DataMaxx then converted to HDD65 and AHDD65 in an Excel spreadsheet by MERC – Gas Supply. Temperature and wind data is the 24-hour average based on the 9am to 9am gas day.

5. In response to comments from the Department, provide an explanation whenever we choose to use a regression model that does not have an intercept.
6. Summarize the Baseload and Use/AHDD65 and Use/Prior Day AHDD65 from each regression.
7. Calculate a point estimate from each regression based on the baseload value plus the Use/AHDD65 coefficient times the coldest AHDD65 since January 1996 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**

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 volumes 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

GLGT Paper Mills =

- Blandon mapped to Bemidji
- Sappi and USG mapped to Cloquet

VGT Lamb Weston mapped to Fargo

NNG Taconites / Direct Connects =

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

NNG OSEU (End Users) =

- ARKEMA INC. mapped to Rochester
- MAYO Clinic 1 Fairmount mapped to Worthington
- MAYO Clinic 2 (Franklin Htg) mapped to Rochester
- MAYO Clinic 3 (St Mary's) mapped to Rochester
- ARCHER DANIELS MIDLAND, CO. mapped to Minneapolis
- ASSOCIATED MILK PRODUCTS, INC. mapped to Rochester
- Hawkins Inc. mapped to Minneapolis
- CORRECTIONAL CTR mapped to Minneapolis
- DAIRY FARMERS OF AMERICA mapped to Rochester
- Dick's Sanitation mapped to Minneapolis
- KEMPS LLC mapped to Rochester
- KERRY BIO-SCIENCE mapped to Rochester
- LAKESIDE mapped to Rochester
- MILK SPECIALTIES mapped to Worthington
- LAND OF LAKES mapped to Rochester
- PRO-CORN mapped to Rochester
- SWIFT mapped to Worthington
- SENECA FOODS-ROCHESTER mapped to Rochester
- ENGINEERED POLYMERS mapped to Cloquet

- SANDSTONE FEDERAL CORRECTIONAL INSTITUTE mapped to Cloquet
- Agra Resources(Exol) mapped to Rochester
- Halcon Corporation mapped to Rochester
- REG ALBERT LEA, LLC mapped to Rochester
- Zinpro North Branch mapped to Minneapolis

B. Daily Firm Capacity

VGT

- DETROIT LAKES MIDDLE SCHOOL
- ROSSMAN SCHOOL

GLGT

- NORTHLAND APTS

NNG

- 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 no-intercept models if it chooses to use one again in the future.

In a regression analysis, using time series data, autocorrelation of the errors is a problem. Autocorrelation of the errors, which themselves are unobserved, can generally be detected because it produces autocorrelation in the observable residuals. (Errors are also known as "error terms" in econometrics.) Autocorrelation violates the ordinary least squares (OLS) assumption that the error terms are uncorrelated. While it does not bias the OLS coefficient estimates, the standard errors tend to be underestimated (and the t-scores overestimated) when the autocorrelations of the errors at low lags are positive. The traditional test for the presence of first-order autocorrelation is the Durbin-Watson statistic or, if the explanatory variables include a lagged dependent variable, Durbin's h statistic. To correct for

this use, we used the Yule-Walker estimation method within the SAS software package to employ an AR(1) regression which then showed that the Durbin–Watson statistics are all either close to 2 or above.

5. Design-Day Model

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

6. Verification of Regression Analysis Results

Order Point 10 of the Commission’s April 28, 2016, Order in Docket No. G011/M-15-722 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.

7. Albert Lea Telemetry Data

Order Point 11 of the Commission’s April 28, 2016 Order in Docket Nos. G011/M-15-722, G011/M-15-723, and G011/M-15-724, required:

If the Commission approves MERC's general rate case proposal to consolidate its MERC-NNG and MERC-Albert Lea PGA areas into one PGA area, direct MERC to work with the Department in developing an appropriate Design Day regression analysis methodology for its subsequent demand entitlement petitions until MERC has three years daily interruptible data available for all its interruptible customers for the consolidated 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 one year 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.

ATTACHMENT D

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-19-_____

CERTIFICATE OF SERVICE

I, Kristin M. Stastny, hereby certify that on the 1st day of August, 2019, 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 www.edockets.state.mn.us. Said documents were also served via U.S. mail and electronic service as designated on the attached service list.

Dated this 1st day of August, 2019.

/s/ Kristin M. Stastny
Kristin M. Stastny

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Tamie A.	Aberle	tamie.aberle@mdu.com	Great Plains Natural Gas Co.	400 North Fourth Street Bismarck, ND 585014092	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Michael	Ahern	ahern.michael@dorsey.com	Dorsey & Whitney, LLP	50 S 6th St Ste 1500 Minneapolis, MN 554021498	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Kristine	Anderson	kanderson@greatermngas.com	Greater Minnesota Gas, Inc.	202 S. Main Street Le Sueur, MN 56058	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Christopher	Anderson	canderson@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022191	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Mara	Ascheman	mara.k.ascheman@xcelenergy.com	Xcel Energy	414 Nicollet Mall Fl 5 Minneapolis, MN 55401	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Gail	Baranko	gail.baranko@xcelenergy.com	Xcel Energy	414 Nicollet Mall 7th Floor Minneapolis, MN 55401	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Elizabeth	Brama	ebrama@briggs.com	Briggs and Morgan	2200 IDS Center 80 South 8th Street Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Robert S.	Carney, Jr.			4232 Colfax Ave. S. Minneapolis, MN 55409	Paper Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
John	Coffman	john@johncoffman.net	AARP	871 Tuxedo Blvd. St. Louis, MO 63119-2044	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1800 St. Paul, MN 55101	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Riley	Conlin	riley.conlin@stoel.com	Steel Rives LLP	33 S. 6th Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
George	Crocker	gwillc@nawo.org	North American Water Office	PO Box 174 Lake Elmo, MN 55042	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Ian	Dobson	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Rebecca	Eilers	rebecca.d.eilers@xcelenergy.com	Xcel Energy	414 Nicollet Mall - 401 7th Floor Minneapolis, MN 55401	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Darcy	Fabrizius	Darcy.fabrizius@constellation.com	Constellation Energy	N21 W23340 Ridgeview Pkwy Waukesha, WI 53188	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280 Saint Paul, MN 551012198	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Daryll	Fuentes	dfuentes@usg.com	USG Corporation	550 W Adams St Chicago, IL 60661	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Edward	Garvey	garveyed@aol.com	Residence	32 Lawton St Saint Paul, MN 55102	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Edward	Garvey	edward.garvey@AESLconsulting.com	AESL Consulting	32 Lawton St Saint Paul, MN 55102-2617	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Todd J.	Guerrero	todd.guerrero@kutakrock.com	Kutak Rock LLP	Suite 1750 220 South Sixth Street Minneapolis, MN 554021425	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Robert	Harding	robert.harding@state.mn.us	Public Utilities Commission	Suite 350 121 7th Place East St. Paul, MN 55101	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Kimberly	Hellwig	kimberly.hellwig@stoel.com	Stoel Rives LLP	33 South Sixth Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Annete	Henkel	mui@mutilityinvestors.org	Minnesota Utility Investors	413 Wacouta Street #230 St.Paul, MN 55101	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Michael	Hoppe	il23@mtn.org	Local Union 23, I.B.E.W.	932 Payne Avenue St. Paul, MN 55130	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Gregory	Jenner	greg.jenner@stoel.com	Stoel Rives LLP	33 South Sixth Street Ste 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Linda	Jensen	linda.s.jensen@ag.state.mn.us	Office of the Attorney General-DOC	1800 BRM Tower 445 Minnesota Street St. Paul, MN 551012134	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Richard	Johnson	Rick.Johnson@lawmoss.com	Moss & Barnett	150 S. 5th Street Suite 1200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Sarah	Johnson Phillips	sarah.phillips@stoel.com	Stoel Rives LLP	33 South Sixth Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Michael	Krikava	mkrikava@briggs.com	Briggs And Morgan, P.A.	2200 IDS Center 80 S 8th St Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Nicolle	Kupser	nkupser@greatermngas.com	Greater Minnesota Gas, Inc.	202 South Main Street P.O. Box 68 Le Sueur, MN 56058	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Peder	Larson	plarson@larkinhoffman.com	Larkin Hoffman Daly & Lindgren, Ltd.	8300 Norman Center Drive Suite 1000 Bloomington, MN 55437	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Eric	Lipman	eric.lipman@state.mn.us	Office of Administrative Hearings	PO Box 64620 St. Paul, MN 551640620	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Peter	Madsen	peter.madsen@ag.state.mn.us	Office of the Attorney General-DOC	Bremer Tower, Suite 1800 445 Minnesota Street St. Paul, Minnesota 551017741	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Pam	Marshall	pam@energycents.org	Energy CENTS Coalition	823 7th St E St. Paul, MN 55106	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Mary	Martinka	mary.a.martinka@xcelenergy.com	Xcel Energy Inc	414 Nicollet Mall 7th Floor Minneapolis, MN 55401	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Brian	Meloy	brian.meloy@stinson.com	STINSON LLP	50 S 6th St Ste 2600 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Joseph	Meyer	joseph.meyer@ag.state.mn.us	Office of the Attorney General-RUD	Bremer Tower, Suite 1400 445 Minnesota Street St Paul, MN 55101-2131	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
David	Niles	david.niles@avantenergy.com	Minnesota Municipal Power Agency	220 South Sixth Street Suite 1300 Minneapolis, Minnesota 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Samantha	Norris	samanthanorris@alliantenergy.com	Interstate Power and Light Company	200 1st Street SE PO Box 351 Cedar Rapids, IA 524060351	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Greg	Palmer	gpalmer@greatermngas.com	Greater Minnesota Gas, Inc.	PO Box 68 202 South Main Street Le Sueur, MN 56058	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Catherine	Phillips	catherine.phillips@we-energies.com	We Energies	231 West Michigan St Milwaukee, WI 53203	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Lauren	Pockl	lpockl@briggs.com	Briggs and Morgan, PA	80 South 8th Street #2200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Richard	Savelkoul	rsavelkoul@martinsquires.com	Martin & Squires, P.A.	332 Minnesota Street Ste W2750 St. Paul, MN 55101	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Adam	Schurle	adam.schurle@stoel.com	Stoel Rives LLP	33 South Sixth Street, Suite 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix And Associates	7400 Lyndale Ave S Ste 190 Richfield, MN 55423	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Colleen	Sipiorski	Colleen.Sipiorski@wecenergygroup.com	Minnesota Energy Resources Corporation	700 North Adams St Green Bay, WI 54307	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Kristin	Stastny	kstastny@briggs.com	Briggs and Morgan, P.A.	2200 IDS Center 80 South 8th Street Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
James M	Strommen	jstrommen@kennedy-graven.com	Kennedy & Graven, Chartered	200 S 6th St Ste 470 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Lynnette	Sweet	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Lisa	Veith	lisa.veith@ci.stpaul.mn.us	City of St. Paul	400 City Hall and Courthouse 15 West Kellogg Blvd. St. Paul, MN 55102	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Casey	Whelan	cwhelan@kinectenergy.com	Kinect Energy Group	605 Highway 169 N Ste 1200 Plymouth, MN 55441	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement
Mary	Wolter	mary.wolter@wecenergygroup.com	Minnesota Energy Resources Corporation (HOLDING)	231 West Michigan St Milwaukee, WI 53203	Electronic Service	No	GEN_SL_Minnesota Energy Resources Corporation (HOLDING)_2019 Demand Entitlement