



Marcia A. Podratz  
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August 13, 2014

**VIA ELECTRONIC FILING**

Dr. Burl W. Haar  
MN Public Utilities Commission  
121 7<sup>th</sup> Place East, Suite 350  
St. Paul, MN 55101-2147

RE: In the Matter of Minnesota Power's Petition for Approval of  
Light Emitting Diode Rates for Street and Highway Lighting Service  
Docket No. E015/M-14-\_\_\_\_\_

Dear Dr. Haar,

Minnesota Power hereby electronically submits this Petition to the Minnesota Public Utilities Commission to seek for Approval of Light Emitting Diode Rates for Street Highway Lighting Service.

Please contact me at the number above if you have any questions regarding this filing.

Yours truly,

Marcia A. Podratz

Attachment  
c: Service List

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

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In the Matter of Minnesota Power's  
Petition for Approval of  
Light Emitting Diode Rates  
for Street and Highway Lighting Service

Docket No. E015/M-14-\_\_\_\_\_

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**SUMMARY**

Minnesota Power (Company) submits this Petition to the Minnesota Public Utilities Commission (Commission) to seek the Commission's approval of its proposed Light Emitting Diode (LED) rates for its existing Street and Highway Lighting Service. The proposed new service options address Minnesota Power's street lighting customers' desire to utilize more efficient technology for street lights as an alternative to the Company's existing street lighting service.

## I. INTRODUCTION

Minnesota Power's existing Street and Highway Lighting service offerings for governmental subdivisions include Mercury Vapor (MV), Sodium Vapor (SV) and Metal Halide (MH) lamp types in multiple luminaire designs. However, Mercury Vapor Lamps are closed to new installations for Street and Highway Lighting Service.

In addition to the various types of lamps available, there are several ownership and maintenance options:

- Option 1: Company owns, installs, and maintains;
- Option 2 (closed to new installations): Customer owns mast arm and fixture and Company owns everything else, Company performs maintenance on bulb and photo eyes at its cost, and all other maintenance is at customer's expense;
- Option 3 (closed to new installations): Customer owns pole, mast arm, fixture and light and has a point of disconnect, and the Company maintains at customer's expense; and
- Option 4: Customer owns, installs, and maintains everything and buys only the energy from Minnesota Power.

Customers have begun to show interest in Light Emitting Diode (LED) street lighting, and the Company does not currently have an unmetered LED street lighting rate option. In this filing the Company addresses this issue and proposes new LED street lighting rates.

## II. PROCEDURAL MATTERS

### A. General Filing Information

Pursuant to Minn. Stat. § 216B.16, subd. 1 and Minn. Rule 7829.1300, Minnesota Power provides the following required general filing information.

#### 1. Summary of Filing (Minn. Rule 7829.1300, subp.1)

A one-paragraph summary accompanies this Petition.

**2. Service on Other Parties (Minn. Rule 7829.1300, subp.2)**

Pursuant to Minn. Stat. § 216.17, subd. 3 and Minn. Rules 7829.1300, subp. 2, Minnesota Power eFiles the Petition on the Department of Commerce – Division of Energy Resources and the Office of the Attorney General – Antitrust and Utilities Division. A summary of the filing prepared in accordance with Minn. Rules 7829.1300, subp. 1 is being served on Minnesota Power’s general service list.

**3. Name, Address and Telephone Number of Utility (Minn. Rule 7829.1300, subp. 4(A))**

Minnesota Power  
30 West Superior Street  
Duluth, MN 55802  
(218) 722-2641

**4. Name, Address and Telephone Number of Utility Attorney (Minn. Rule 7829.1300, subp. 4(B)).**

Christopher D. Anderson  
Associate General Counsel  
Minnesota Power  
30 West Superior Street  
Duluth, MN 55802  
(218) 723-3961  
canderson@allete.com

**5. Date of Filing and Date Proposed Rate Takes Effect (Minn. Rule 7829.1300, subp. 4(C))**

This Petition is being filed on August 13, 2014. Minn. Rule 7825.3200 requires that utilities serve notice to the Commission at least 90 days prior to the proposed effective date of modified rates. Minnesota Power is not proposing to implement the LED street lighting rate prior to Commission approval.

**6. Statute Controlling Schedule for Processing the Filing (Minn. Rule 7829.1300, subp. 4(D))**

This Petition is made pursuant to Minn. Stat. § 216B.16. Minn. Rule 7825.3200 requires that utilities serve notice to the Commission at least 90 days prior to the proposed effective date of modified rates. Furthermore, Minnesota Power’s proposed LED street lighting rate falls within the definition of a “Miscellaneous Tariff Filing” under Minn. Rules 7829.0100, subp. 11 and 7829.1400 subp. 1 and 4, permitting comments in response to a miscellaneous filing to be filed within 30 days, and reply comments to be filed no later than 10 days thereafter.

**7. Utility Employee Responsible for Filing (Minn. Rule 7829.1300, subp. 4(E))**

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**8. Impact on Rates and Services (Minn. Rule 7829.1300, subp. 4(F))**

The proposed LED street lighting rate will have no effect on Minnesota Power’s overall revenue requirements. The LED street lighting rate is intended as an alternative to existing rate options and is designed to reflect higher LED investment costs, very low maintenance cost, and much lower energy consumption compared to existing MV lamps, SV lamps, and MH lamps. The additional information required under Minn. Rule 7829.1300, subp. 4(F) is included throughout this Petition.

**9. Service List (Minn. Rule 7829.0700)**

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### **III. MINNESOTA POWER'S PROPOSAL**

Minnesota Power has been contacted by several cities within its service territory that have expressed a strong interest in new street lighting technologies. The LED option for Street and Highway Lighting Service is designed to respond to these customer requests. In this filing, the Company will discuss its recent street lighting pilot project, the proposed rate design and tariff sheet revisions, and the conversion process.

#### **A. Street Lighting Pilot Project**

Minnesota Power selected the City of International Falls (City) as a site for its LED street lighting pilot project. In 2012 when Minnesota Power conducted a pole attachment audit, it identified that the street lighting system in International Falls no longer complied with the Company's standards. The City-owned lighting circuits and associated equipment were located in the electric supply area or supply zone of the Company's poles. This zone can be maintained only by a worker who is qualified by the National Electrical Safety Code (NESC) and Occupational Safety and Health Administration (OSHA).

To help resolve the situation, the Company offered an option that would benefit both the City and Minnesota Power: to purchase the lights and all associated circuits that were located in the supply zone at a nominal price and, in exchange, the Company would test new LED street lighting fixtures in the City. The Company began the City of International Falls LED pilot program in July 2012, and installations were completed in March 2013. The Company installed 150 LED replacement street lighting fixtures at no cost to the customer to test lights from a number of manufacturers and to gather usage data. The pilot program lasted for twelve months. Usage data were measured for six months, the time for which the manufacturer loaned the metering technology to the Company, and then calculated based on fixture wattage and burning hours after that.

The Company tested equipment from several manufacturers and evaluated the LED lights based on technical categories. After the tests and the post-installation evaluations were

completed, General Electric (GE) fixtures were selected based on the greatest light intensity, the least light intensity change, and the ease of installation and maintenance by line workers.

## **B. Description of Proposed LED Street Lighting Rate and Tariff Sheet Modifications**

### **a. Proposed LED Street Lighting Rate**

The LED street lighting rate is proposed to be offered under Option 1 of the Company's existing Street and Highway Lighting Service.<sup>1</sup> In this option, the upfront fixture and installation costs are paid by the Company. The Company owns, installs, operates, and maintains all components of the street light facilities.

The LED street lighting rate is derived following the same basic methodology used to develop the Company's existing street lighting rates.<sup>2</sup> In the Company's 2009 rate case, the lighting cost-of-service ("lighting COS") study was used as a guideline in determining the proposed rates for each size and type of lamp/fixture, along with overall lighting class revenue requirements from the Company's class cost-of-service study in the rate case and customer billing impacts. Some minor changes to the prior methodology were made in the LED lighting COS. A summary of the analysis is provided as Attachment A, pages 1 and 2. On page 2, the Company limited the calculation of the pole cost to the 30-foot pole instead of also including the larger pole sizes that were in the rate case lighting COS. The 30-foot pole generally carries street lights under Option 1. In addition, to avoid double counting of pole investment cost, the Company also deleted the annualization of the pole cost<sup>3</sup> from the prior methodology, because the pole cost allocated to lighting is reported with the lighting fixture investment costs (page 1, line 11), and the total fixture investment cost is subsequently annualized after (page 1, line 20). These changes did not substantially modify the structure of the lighting COS. The LED lighting COS analysis incorporates the annual revenue requirements associated with purchasing, installing and maintaining equipment, along with the cost of providing electricity. The customer

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<sup>1</sup> Minnesota Power Rate Book, Volume 1, Section V, Pages No. 46-46.2, Revision 10, Street and Highway Lighting Service.

<sup>2</sup> *In the Matter of the Application of Minnesota Power for Authority to Increase Rates for Electric Utility Service in Minnesota.* Docket No. E015/GR-09-1151, Volume IV, Rate Design Workpaper RD-4.

<sup>3</sup> *In the Matter of the Application of Minnesota Power for Authority to Increase Rates for Electric Utility Service in Minnesota.* Docket No. E015/GR-09-1151, Volume IV, Rate Design Workpaper, RD 4-5.

pays a monthly rate for each Company-owned street light plus all applicable adjustments. Minnesota Power proposes Company-owned monthly charges for two sizes of LED fixtures: 54 watts (LED 54W) and 118 watts (LED 118W). These are intended to be alternatives to existing street lights as follows:

- The LED 54W will replace the SV 100W and 150W street lights, and
- The LED 118W will replace the SV 200W and 250W street lights.

The proposed monthly rates calculated in the lighting COS are \$12.88 for LED 54W and \$17.04 for LED 118W.

Attachment A, page 3 of 3 is a summary table that provides a side-by-side comparison of the standard SV street light and the comparable LED street light specifications and rates. The proposed LED rates are slightly below the existing SV light rates. The higher investment cost for LED lights is offset by lower energy and maintenance costs.

#### **b. Tariff Sheet Modifications**

The Company proposes to modify the Street and Highway Lighting Service tariff sheet to include the LED rates. The modifications establish the monthly rates and the LED energy usage. The modified tariff sheet is provided as Attachment B (redline version) and as Attachment C (clean version). The proposed modifications are summarized in two categories: tariff sheet cleanup and LED rate driven.

##### Tariff Sheet Cleanup

- Under **TERRITORY**, the sentence “Rate Code 85 customers are limited to the corporate city limits of International Falls, Minnesota” is deleted. Minnesota Power requested and was granted approval of this language change in the 2009 retail rate case<sup>4</sup> but failed to delete the sentence in this section of the tariff sheet in the rate case compliance filing.
- Under **RATE**, Sodium Vapor Lamps, 23,000 Lumens, “230W” is changed to “250W” to correct a typographical error.

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<sup>4</sup> *In the Matter of the Application of Minnesota Power for the Authority to Increase Rates for Electric Utility Service in Minnesota*, Docket E015/Gr-09-1151, Marcia A. Podratz Direct, page 64, lines 3-12.



- Under **ADJUSTMENTS**, number 4, the word “add” is changed to “added” to correct a typographical error.

#### LED Rate Driven

- Under **RATE**, two CIS (Customer Information System) Codes and associated rates are added for LED street lighting. They are CIS Code W for 4,000 Lumens LED 54W and CIS Code Y for 8,800 Lumens LED 118W.
- Under **ENERGY TABLE**, CIS Codes W and Y and their respective monthly kWh usage per fixture type are added to the table.
- Under **SERVICE CONDITIONS**, service condition number 7 is added to provide language for conversion and removal fees for customers wishing to replace SV lamps.
- In several places in the tariff sheet, the word lamp is deleted and replaced by “fixture(s)” to refer to all street light fixtures.

### **C. LED Street Light Conversions**

Customers who want to install LED street lights currently can do so under the Company’s existing street light Option 4, where the customer owns and maintains all equipment. Under Option 4, customers are billed an existing energy-only rate of 5.882¢<sup>5</sup> per kWh. The Company does not plan to modify this rate at this time.

Customer demand for LED street lights is steadily increasing, and there are several benefits of LED street lighting. Minnesota Power believes that the light quality has improved, the energy usage is more efficient, the components are durable and long-lasting, the maintenance cost is low, and the cost of the fixtures is decreasing. Although Minnesota Power now proposes to offer this new technology to its customers under Option 1, the Company anticipates that it could face significant stranded costs associated with mass conversion especially of newer SV street lamps where substantial un-depreciated costs remain. Minnesota Power prefers to proceed with conversions based on group re-lamping schedules. However, the Company will carefully examine the request of each customer wishing to replace its street lamps with LED street lights

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<sup>5</sup> Minnesota Power Rate Book Volume I, Section V, page No. 46, Revision 10. See Attachment B, Energy Charge per kWh.

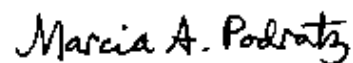
and will schedule those requests on a case-by-case basis. If group re-lamping is not justified for an area based on factors such as the age or condition of fixtures, Customers with newer lamps who want to convert to LED lights will be required to pay for the remaining un-depreciated facility cost. For customers currently taking service under Option 2, where the customer owns the mast arm and the fixture, a removal fee of \$100 will be assessed if the Company removes the light and the mast arm, and a removal fee of \$50 will be assessed if the Company removes the light and leaves the mast arm up to be reused for a different fixture. For Customers under Option 3, where the Customer also owns the pole and the light, the Company will bill actual costs for removal of light and mast arm.

#### IV. CONCLUSION

Minnesota Power has been sharing the information gathered through its LED pilot project with cities and assisting them in evaluating potential lighting technology upgrades. Minnesota Power requests that the Commission approve the proposed modification of the Street and Highway Lighting Service to include an LED rate that will allow the customers to enjoy the advantages of lower energy consumption, better quality of light and less maintenance provided by LED street lighting.

Date August 13, 2014

Respectfully submitted,



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Line No.			GE-LED	GE-LED
1	Fixture Type		GE-LED	GE-LED
2	Watt		54	118
3	Average Monthly kWh per Fixture		19.13	42.67
4	Number of Fixtures		1	1
5	<b>Investment</b>			
6	Fixture		\$239.00	\$326.00
7	Photo Eye		\$14.20	\$14.20
8	Mast Arm		\$85.00	\$85.00
9	Subtotal		\$338.20	\$425.20
10	Sales Tax	6.875%	\$23.25	\$29.23
11	Allocated Pole Investment Cost		\$9.38	\$9.38
12	Labor Light Installation	3.5 hours	\$310.42	\$310.42
13	Total Fixture Price		\$681.25	\$774.23
14	Material Handling Expense	5.60%	\$38.15	\$43.36
15	Conductor (150' of #6 Dplx)	150	\$0.290	\$43.50
16	Subtotal		\$762.90	\$861.08
17	A&G Expense	4.50%	\$34.33	\$38.75
18	<b>Total Investment</b>	<b>Option 1</b>	<b>\$797.23</b>	<b>\$899.83</b>
19	<b>Annual Costs</b>			
20	Fixed Charges	12.93%	\$103.08	\$116.35
21	Photo Eye Replacement - Materials		\$0.71	\$0.71
22	Driver Replacement - Materials 2/		\$0.71	\$0.74
23	Photo Eye Replacement - Labor		\$13.90	\$13.90
24	Driver Replacement - Labor 2/		\$1.39	\$1.39
25	Billing & Collections		\$0.18	\$0.18
26	Subtotal - Option 1		\$119.97	\$133.27
27	A&G Expense	4.50%	\$5.40	\$6.00
28	<b>Annual Costs</b>		\$125.37	\$139.27
29	<b>Monthly Costs</b>		\$10.45	\$11.61
30	Energy Rate (\$/kWh)	1/ \$0.1271641	\$2.43	\$5.43
31	<b>Monthly Revenue Requirement</b>		\$12.88	\$17.04

1/ In the Matter of Application of Minnesota Power for Authority to Increase Electric Service Rates in Minnesota Docket No. E-015/GR-09-1151, Workpaper Vol IV, Lighting Cost of Service, Street and Highway Lighting Service (80,83,84) RD-4-4, Energy Rev @ (\$/kWh)

2/ The manufacturer (GE) predicts that there will be 10% driver failure during the 20 years life span of the fixture

Minnesota Power  
 LED Lighting Cost of Service  
 Distribution Poles

Line No.		Rates	Number of Hours	Distribution Poles 30Ft
1				
2	<b>Investment Costs</b>			
3	Pole Cost			\$142.09
4	Sales Tax	6.875%		\$9.77
5	Local Tax	1.00%		\$1.42
6	Total Pole Price			\$151.86
7	Material Handling Expense	5.60%		\$8.50
8	Labor Install Street Light Pole	\$65.69	4	\$262.76
9	Subtotal			\$423.12
10	A&G Expense	4.50%		\$19.04
11	Subtotal			\$442.16
12	Vehicle Expense	\$23.00	4	\$92.00
13	Total Investment			\$534.16
14	Investment Cost Allocated to Street Lighting	1.76%		\$9.38
	2256/128486=1.76% (Total Street Lighting Only-Poles/Total MP Owned Dist Poles)			
15	<b>Cust. Accts Revenue Req'mts per COS</b>			\$3,441
16	Total Number of Fixtures			19,309
17	Avg. Cust. Accts Rev Req'mts per Fixture			\$0.18
18	<b>Driver/Photo Eye Replacement Cost</b>			
19	Truck Cost			\$69.00
20	Labor costs w/ overheads			\$197.07
21	A&G costs	4.50%		\$11.97
22	Total cost for Driver/Photo Eye replacement			\$278.04
23	Expected life for Driver, Fixture, Photo Eye			20
24	<b>Driver Material Cost</b>		<b>54W</b>	<b>118W</b>
25	Driver Cost		\$142.00	\$147.92

Minnesota Power  
 LED Lighting Cost of Service  
 Street Light Rates Comparison per Lamp/Fixture  
 Standard Sodium Vapor Lamp vs. LED Fixture  
 Option 1

<b>Designation</b>	<b>Standard SV</b>		<b>LED Street Light</b>
CIS Code	I	X	W
Wattage Size	100W	150W	54W
Lumens	8,500	14,000	4,000
Annual Usage per Fixture	504	756	230
Monthly Billed kWh	42	63	19
Monthly Charge per Lighting COS Analysis	\$13.62	\$15.73	\$12.88
CIS Code	F	G	Y
Wattage Size	200W	250W	118W
Lumens	20,500	20,500	8,800
Annual Usage per Fixture	1,140	1,224	512
Monthly Billed kWh	95	102	43
Monthly Charge per Lighting COS Analysis	\$18.32	\$19.77	\$17.04

MINNESOTA POWER  
ELECTRIC RATE BOOK - VOLUME I

SECTION  V   
REVISION  12+

STREET AND HIGHWAY LIGHTING SERVICE

RATE CODES

Highway Lighting Service	80
Overhead Street Lighting Service	83
Ornamental Street Lighting Service	84

TERRITORY

Applicable in all territories served at retail by the Company. ~~Rate Code 85 customers are limited to the corporate city limits of International Falls, Minnesota.~~  
Highway Lighting Service is subject to individual review for each point of delivery.

APPLICATION

To any governmental subdivision taking all of its street or highway lighting requirements for service within the Company's service territory under the Company's standard contract for such service, subject to any applicable Riders. Highway Lighting Service is limited to the State of Minnesota, Department of Highways exclusively for public highway lighting.

RATE

Lamp Type & Size Sub rate code	CIS Code	Rate Per <del>Lamp-Fixture</del> Per Month			
		Option 1 _ _ A	Option 2 _ _ B	Option 3 _ _ C	Option 4 _ _ D
			(Option 2 Closed to New Installation)	Option 3 Closed to New Installation)	
Mercury Vapor Lamps (Closed to New Installations)					
7,000 Lumens (175 watts)	K	15.94	8.33	8.06	
10,000 Lumens (250 watts)	L			10.18	
20,000 Lumens (400 watts)	M	21.33	14.23	13.76	
55,000 Lumens (1,000 watts)	O			25.22	
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	I	13.62	6.83	6.48	
14,000 Lumens (150 watts)	X	15.73	8.59	8.33	
14,000 Lumens (150 watts)	A			8.33	
20,500 Lumens (200 watts)	F	18.32	10.08	9.95	
23,000 Lumens (230 watts)	G	19.77	11.05	10.75	
45,000 Lumens (400 watts)	Z	24.22	14.95	14.09	
Metal Halide Lamps					
28,800 Lumens (400 watts)	S		13.11		
Light Emitting Diode (LED)					
4,000 Lumens (54 watts)	W	12.88			
8,800 Lumens (118 watts)	Y	17.04			
Energy Charge -- Per kWh		Included	Included	Included	5.882¢
Plus any applicable adjustments					

Filing Date ~~December 20, 2013~~ August 13, 2014      MPUC Docket No. ~~E015/M-13-1166~~  
Effective Date August 1, 2014      Order Date July 2, 2014

Approved by: Marcia A. Podratz  
**Marcia A. Podratz**  
Director - Rates

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**STREET AND HIGHWAY LIGHTING SERVICE**

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**ADJUSTMENTS**

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy Adjustment.

The monthly fuel and purchased energy adjustment per ~~lamp~~-~~fixture~~ shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per ~~lamp~~-~~fixture~~ shown in the Energy Table below for the respective ~~lamps~~~~fixtures~~.

2. There shall be add to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Arrowhead Regional Emission Abatement (AREA).

3. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.

4. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.

5. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.

6. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.

7. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

8. Bills for service to parties other than the City of Duluth within the corporate limits of the City of Duluth shall include an upward adjustment as specified in the Rider for City of Duluth Franchise Fee.

**PAYMENT**

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

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Filing Date ~~December 20, 2013~~ August 13, 2014 MPUC Docket No. E015/M-13-1166  
Effective Date August 1, 2014 Order Date July 2, 2014

Approved by: Marcia A. Podratz  
**Marcia A. Podratz**  
Director - Rates

MINNESOTA POWER  
ELECTRIC RATE BOOK - VOLUME I

SECTION  V   
REVISION  12+

**STREET AND HIGHWAY LIGHTING SERVICE**

**BURNING SCHEDULE**

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

**ENERGY TABLE**

**Lamp Fixture**

CIS Code	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burning Hours	4,200	462	379	367	302	264	233	252	294	336	401	435	475
<b>Monthly kWh usage per lamp fixture by type</b>													
A	468	52	42	41	34	29	26	28	33	37	45	48	53
C	1,356	149	122	119	98	85	75	81	95	109	130	140	153
F	1,140	125	103	100	82	72	63	68	80	91	109	118	129
G	1,224	135	110	107	88	77	68	73	86	98	117	127	138
I	504	56	46	44	36	32	28	30	35	40	48	52	57
K	888	98	80	78	64	56	49	53	62	71	85	92	100
L	1,224	135	110	107	88	77	68	73	86	98	117	127	138
M	1,932	213	174	169	139	121	107	116	135	155	184	200	219
O	4,620	508	417	404	332	290	256	277	323	370	441	479	523
S	1,932	213	174	169	139	121	107	116	135	155	184	200	219
V	2052	226	185	179	147	129	114	123	144	164	196	213	232
W	230	24	22	19	17	15	14	13	15	18	22	24	27
X	756	83	68	66	54	48	42	45	53	60	72	78	87
Y	512	54	49	43	38	33	30	28	34	40	49	54	60
Z	2,016	222	182	176	145	127	112	121	141	161	192	209	228

Company shall furnish all electric energy required for service under this schedule.

**EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE**

New Customers with new installations must select Option 1 or Option 4 only for each account served under this schedule. Options 2 and 3 are closed to new installations. Options 1 or 4 are available for Overhead Lighting Service and for Highway or Ornamental Lighting Service.

Option 1

COMPANY TO OWN AND MAINTAIN.

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, lamp fixture, ballast, photo-electric control, driver, and wiring.

Filing Date  December 20, 2013 August 13, 2014  MPUC Docket No.  E015/M-13-1166   
Effective Date  August 1, 2014  Order Date  July 2, 2014

Approved by:  Marcia A. Podratz   
**Marcia A. Podratz**  
**Director - Rates**



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**STREET AND HIGHWAY LIGHTING SERVICE**

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Option 2

1. The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's facilities. The equipment shall include, but not be limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, lamp, ballast, photo-electric control and all minor materials. All customer-owned equipment must meet Company's specifications. In all cases, poles are owned by Company.

2. The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls. Option 2 is closed to new installations.

Option 3

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include, but not be limited to, the posts, fixture, mounting bracket, lamp, ballast and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications.

2. The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. The Company will furnish and replace all burned out lamps and photo-electric controls and will clean or replace glassware at the time of lamp replacement. Customer shall be responsible for providing replacement glassware. No maintenance will be provided by the Company on customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4

**CUSTOMERS TO OWN AND MAINTAIN:**

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include

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Filing Date  ~~December 20, 2013~~ August 13, 2014  MPUC Docket No.  E015/M-13-1166   
Effective Date  August 1, 2014  Order Date  July 2, 2014

Approved by:  Marcia A. Podratz   
**Marcia A. Podratz**  
**Director - Rates**

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**STREET AND HIGHWAY LIGHTING SERVICE**

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but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install in master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications.

2. Customer is responsible for all maintenance on all equipment beyond Company's point of attachment. Standard safety procedures followed by the Company on Company-owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

**CONTRACT PERIOD**

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

**SERVICE CONDITIONS**

1. Customers will contract for service under this schedule for the number of ~~lamps~~ fixtures of each size installed at the time of the contract.
2. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen. The Company shall have the right to use and occupy the street and highway rights-of-way for the purpose of performing any act of service in connection with service under this schedule.
3. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.
4. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

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**STREET AND HIGHWAY LIGHTING SERVICE**

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5. Company will install at its expense such additional street lights served under Option 1 as may be requested in writing and duly authorized by Customer from time to time during the period of the contract. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Option 4 Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

6. For ~~lamps~~ fixtures which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at each location during each calendar year. In addition, Company will absorb the cost of replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1.

All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

7. Existing Option 1 Customers who wish to replace Sodium Vapor fixtures that are less than ten years old and not in need of significant maintenance or repair with LED street lights will pay Company the remaining un-depreciated facility cost. Under Option 2, Customers who convert to LED street lights will be assessed a removal fee of \$50 if the mast arm is left up and reused or \$100 if the mast arm is removed and not reused. Under Option 3, the Company's Compatible Unit Estimator (CUE) will be used to estimate the removal fee with a true-up of actual costs once the work is completed.

**SCHEDULE OF CHARGES**

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Charges for materials used per the Company's cost for lighting replacement equipment plus the then current Materials Handling expense and A&G expense per Company's Accounting Manual.

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Director - Rates

**MINNESOTA POWER  
ELECTRIC RATE BOOK - VOLUME I**
**SECTION**  V  **PAGE NO.**  46   
**REVISION**  12 


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**STREET AND HIGHWAY LIGHTING SERVICE**


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**RATE CODES**

Highway Lighting Service	80
Overhead Street Lighting Service	83
Ornamental Street Lighting Service	84

**TERRITORY**

Applicable in all territories served at retail by the Company. Highway Lighting Service is subject to individual review for each point of delivery.

**APPLICATION**

To any governmental subdivision taking all of its street or highway lighting requirements for service within the Company's service territory under the Company's standard contract for such service, subject to any applicable Riders. Highway Lighting Service is limited to the State of Minnesota, Department of Highways exclusively for public highway lighting.

**RATE**

<u>Lamp Type &amp; Size</u> Sub rate code	<u>CIS Code</u>	<b>Rate Per Fixture Per Month</b>			
		<u>Option 1</u> __A	<u>Option 2</u> __B	<u>Option 3</u> __C	<u>Option 4</u> __D
			(Option 2 Closed to New Installation)	Option 3 Closed to New Installation)	
Mercury Vapor Lamps (Closed to New Installations)					
7,000 Lumens (175 watts)	K	15.94	8.33	8.06	
10,000 Lumens (250 watts)	L			10.18	
20,000 Lumens (400 watts)	M	21.33	14.23	13.76	
55,000 Lumens (1,000 watts)	O			25.22	
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	I	13.62	6.83	6.48	
14,000 Lumens (150 watts)	X	15.73	8.59	8.33	
14,000 Lumens (150 watts)	A			8.33	
20,500 Lumens (200 watts)	F	18.32	10.08	9.95	
23,000 Lumens (230 watts)	G	19.77	11.05	10.75	
45,000 Lumens (400 watts)	Z	24.22	14.95	14.09	
Metal Halide Lamps					
28,800 Lumens (400 watts)	S		13.11		
Light Emitting Diode (LED)					
4,000 Lumens (54 watts)	W	12.88			
8,800 Lumens (118 watts)	Y	17.04			
Energy Charge - Per kWh		Included	Included	Included	5.882¢
Plus any applicable adjustments					

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**STREET AND HIGHWAY LIGHTING SERVICE**

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**ADJUSTMENTS**

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy Adjustment.

The monthly fuel and purchased energy adjustment per fixture shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per fixture shown in the Energy Table below for the respective fixtures.

2. There shall be add to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Arrowhead Regional Emission Abatement (AREA).

3. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.

4. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.

5. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.

6. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.

7. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

8. Bills for service to parties other than the City of Duluth within the corporate limits of the City of Duluth shall include an upward adjustment as specified in the Rider for City of Duluth Franchise Fee.

**PAYMENT**

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

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**Director - Rates**

**MINNESOTA POWER  
ELECTRIC RATE BOOK - VOLUME I**
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**REVISION**  12 


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**STREET AND HIGHWAY LIGHTING SERVICE**


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**BURNING SCHEDULE**

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

**ENERGY TABLE****Fixture  
CIS**

Code	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burning Hours	4,200	462	379	367	302	264	233	252	294	336	401	435	475
<b>Monthly kWh usage per fixture by type</b>													
A	468	52	42	41	34	29	26	28	33	37	45	48	53
C	1,356	149	122	119	98	85	75	81	95	109	130	140	153
F	1,140	125	103	100	82	72	63	68	80	91	109	118	129
G	1,224	135	110	107	88	77	68	73	86	98	117	127	138
I	504	56	46	44	36	32	28	30	35	40	48	52	57
K	888	98	80	78	64	56	49	53	62	71	85	92	100
L	1,224	135	110	107	88	77	68	73	86	98	117	127	138
M	1,932	213	174	169	139	121	107	116	135	155	184	200	219
O	4,620	508	417	404	332	290	256	277	323	370	441	479	523
S	1,932	213	174	169	139	121	107	116	135	155	184	200	219
V	2,052	226	185	179	147	129	114	123	144	164	196	213	232
W	230	24	22	19	17	15	14	13	15	18	22	24	27
X	756	83	68	66	54	48	42	45	53	60	72	78	87
Y	512	54	49	43	38	33	30	28	34	40	49	54	60
Z	2,016	222	182	176	145	127	112	121	141	161	192	209	228

Company shall furnish all electric energy required for service under this schedule.

**EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE**

New Customers with new installations must select Option 1 or Option 4 only for each account served under this schedule. Options 2 and 3 are closed to new installations. Options 1 or 4 are available for Overhead Lighting Service and for Highway or Ornamental Lighting Service.

Option 1**COMPANY TO OWN AND MAINTAIN.**

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, fixture, ballast, photo-electric control, driver, and wiring.

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**Marcia A. Podratz**  
**Director - Rates**

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**STREET AND HIGHWAY LIGHTING SERVICE**

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Option 2

1. The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's facilities. The equipment shall include, but not be limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, lamp, ballast, photo-electric control and all minor materials. All customer-owned equipment must meet Company's specifications. In all cases, poles are owned by Company.

2. The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls. Option 2 is closed to new installations.

Option 3

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include, but not be limited to, the posts, fixture, mounting bracket, lamp, ballast and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications.

2. The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. The Company will furnish and replace all burned out lamps and photo-electric controls and will clean or replace glassware at the time of lamp replacement. Customer shall be responsible for providing replacement glassware. No maintenance will be provided by the Company on customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4

**CUSTOMERS TO OWN AND MAINTAIN:**

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include

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**STREET AND HIGHWAY LIGHTING SERVICE**

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but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install in master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications.

2. Customer is responsible for all maintenance on all equipment beyond Company's point of attachment. Standard safety procedures followed by the Company on Company-owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

**CONTRACT PERIOD**

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

**SERVICE CONDITIONS**

1. Customers will contract for service under this schedule for the number of fixtures of each size installed at the time of the contract.
2. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen. The Company shall have the right to use and occupy the street and highway rights-of-way for the purpose of performing any act of service in connection with service under this schedule.
3. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.
4. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

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**STREET AND HIGHWAY LIGHTING SERVICE**

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5. Company will install at its expense such additional street lights served under Option 1 as may be requested in writing and duly authorized by Customer from time to time during the period of the contract. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Option 4 Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

6. For fixtures which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at each location during each calendar year. In addition, Company will absorb the cost of replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1. All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

7. Existing Option 1 Customers who wish to replace Sodium Vapor fixtures that are less than ten years old and not in need of significant maintenance or repair with LED street lights will pay Company the remaining un-depreciated facility cost. Under Option 2, Customers who convert to LED street lights will be assessed a removal fee of \$50 if the mast arm is left up and reused or \$100 if the mast arm is removed and not reused. Under Option 3, the Company's Compatible Unit Estimator (CUE) will be used to estimate the removal fee with a true-up of actual costs once the work is completed.

**SCHEDULE OF CHARGES**

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Charges for materials used per the Company's cost for lighting replacement equipment plus the then current Materials Handling expense and A&G expense per Company's Accounting Manual.

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**Marcia A. Podratz**  
**Director - Rates**

STATE OF MINNESOTA     )  
  ) ss  
COUNTY OF ST. LOUIS     )

AFFIDAVIT OF SERVICE VIA  
E-FILING AND  
FIRST CLASS MAIL

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Susan Romans, of the City of Duluth, County of St. Louis, State of Minnesota, says that on the 13<sup>th</sup> day of August, 2014, she e-filed Minnesota Power's Petition for Approval of Light Emitting Diode Rates for Street and Highway Lighting Service on Burl Haar and Sharon Ferguson. The remaining parties on the attached Service List were served as requested as well as the City of International Falls was served via U.S. Mail.



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Susan Romans

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Julia	Anderson	Julia.Anderson@ag.state.mn.us	Office of the Attorney General-DOC	1800 BRM Tower 445 Minnesota St St. Paul, MN 551012134	Electronic Service	Yes	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
Christopher	Anderson	canderson@allete.com	Minnesota Power	30 W Superior St  Duluth, MN 558022191	Electronic Service	Yes	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 500  Saint Paul, MN 551012198	Electronic Service	Yes	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
Elizabeth	Goodpaster	bgoodpaster@mncenter.org	MN Center for Environmental Advocacy	Suite 206 26 East Exchange Street St. Paul, MN 551011667	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
Burl W.	Haar	burl.haar@state.mn.us	Public Utilities Commission	Suite 350 121 7th Place East St. Paul, MN 551012147	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
Margaret	Hodnik	mhodnik@mnpower.com	Minnesota Power	30 West Superior Street  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
Lori	Hoyum	lhoyum@mnpower.com	Minnesota Power	30 West Superior Street  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
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 Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
James D.	Larson	james.larson@avantenergy.com	Avant Energy Services	220 S 6th St Ste 1300  Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
Douglas	Larson	dlarson@dakotaelectric.com	Dakota Electric Association	4300 220th St W  Farmington, MN 55024	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List
John	Lindell	agorud.ecf@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012130	Electronic Service	Yes	GEN_SL_Minnesota Power_GEN_SL_Minnesota a Power_Minnesota Power General Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Susan	Ludwig	sludwig@mnpower.com	Minnesota Power	30 West Superior Street  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Pam	Marshall	pam@energycents.org	Energy CENTS Coalition	823 7th St E  St. Paul, MN 55106	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Herbert	Minke	hminke@allete.com	Minnesota Power	30 W Superior St  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St  Duluth, MN 558022093	Electronic Service	Yes	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Andrew	Moratzka	apmoratzka@stoel.com	Stoel Rives LLP	33 South Sixth Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Jennifer	Peterson	jjpeterson@mnpower.com	Minnesota Power	30 West Superior Street  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Thomas	Scharff	thomas.scharff@newpagecorp.com	New Page Corporation	P.O. Box 8050 610 High Street Wisconsin Rapids, WI 544958050	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Ron	Spangler, Jr.	rlspangler@otpc.com	Otter Tail Power Company	215 So. Cascade St. PO Box 496 Fergus Falls, MN 565380496	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Eric	Swanson	eswanson@winthrop.com	Winthrop Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List
Karen	Turnboom	karen.turnboom@newpagecorp.com	NewPage Corporation	100 Central Avenue  Duluth, MN 55807	Electronic Service	No	GEN_SL_Minnesota Power_GEN_SL_Minnesot a Power_Minnesota Power General Service List