

**ATTACHMENT B**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**STATE DISPOSAL PERMIT**



## Minnesota Pollution Control Agency

**CERTIFIED MAIL NO: 7004 2510 0000 2117 5535**  
**RETURN RECEIPT REQUESTED**

Mr. Patrick Flowers  
Manager, Water Quality Solid Waste  
Northern States Power d/b/a Xcel Energy  
414 Nicollet Mall  
Minneapolis, MN 55401-1993

RE: Major Modification National Pollutant Discharge Elimination System/State Disposal  
System Permit No. MN 0004006  
Xcel Prairie Island Nuclear Generating Plant  
Welch, Minnesota

Dear Mr. Flowers:

Enclosed is a copy of the reissued final modified National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit for the Prairie Island Nuclear Generating Plant. This permit supersedes an earlier NPDES permit that was issued on September 23, 2005 and modified on January 26, 2006. All written comments received during the public notice period were considered.

It is the responsibility of the Permittee to maintain compliance with all of the terms and conditions of this permit. Please carefully review the entire permit.

We would like to draw your attention to the following:

Limits and Monitoring Requirements:

An additional requirement to monitor and report the total calendar month flow at surface discharge station SD 001 during the months of April, May, and June has been added. The previous permit required that this value be reported only for the months July through March. The modified permit requires year round monitoring and reporting for total calendar month flow at SD 001.

Dredged Material Management Requirements:

The modified permit includes requirements related to the storage, treatment, disposal and/or reuse of dredged material generated at Prairie Island Nuclear Generating Plant. The modified permit does not authorize or regulate the dredging activity itself. Prior to conducting dredging

520 Lafayette Rd. N.; Saint Paul, MN 55155-4194; (651) 296-6300 (Voice); (651) 282-5332 (TTY); [www.pca.state.mn.us](http://www.pca.state.mn.us)

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Mr. Patrick Flowers  
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activities in the bed of public waters the Xcel Energy is required to contact the Minnesota Department of Natural Resources, the U.S. Army Corps of Engineers, the appropriate Soil and water Conservation District, county and/or local unit of government.

If you have any questions regarding any of the terms and conditions of the permit, please contact Katrina Kessler of our staff at 651-296-7376.

Sincerely,



Jeff Stollenwerk  
Supervisor  
Land and Water Quality Permits Section  
Industrial Division

KK:lmg

Enclosures: Final Permit

cc: Jim Bodensteiner, Xcel Energy, Minneapolis (w/enclosures)  
Brent Kuhl, Xcel Energy, Minneapolis (w/enclosures)  
Jeanne Tobias, Xcel Energy, Prairie Island Plant (w/enclosures)  
George Azevedo, Environmental Protection Agency, Chicago (w/enclosure)



**STATE OF MINNESOTA**  
**Minnesota Pollution Control Agency**

**Industrial Division**

**National Pollutant Discharge Elimination System (NPDES) and  
State Disposal System (SDS) Permit MN0004006**

**PERMITTEE:** Northern States Power Company d/b/a Xcel Energy

**FACILITY NAME:** Prairie Island Nuclear Generating Plant

**RECEIVING WATERS:** Mississippi River

**CITY/TOWNSHIP:** Welch

**COUNTY:** Goodhue

**MODIFICATION DATE:** 6/30/2006

**EXPIRATION DATE:** August 31, 2010

The state of Minnesota, on behalf of its citizens through the Minnesota Pollution Control Agency (MPCA), authorizes the Permittee to discharge from this facility to the receiving waters named above, in accordance with the requirements of this permit.

The goal of this permit is to protect water quality according to Minnesota and U.S. statutes and rules, including Minn. Stat. chs. 115 and 116, Minn. R. chs. 7001, 7050 and 7060, and the U.S. Clean Water Act.

This permit is effective on the modification date identified above, and supersedes the previous permit that was issued for this facility on September 23, 2005, and modified on January 26, 2006.

This permit expires at midnight on the expiration date identified above.

Signature:   
Michael (Mike) J. Tibbetts, Manager For The Minnesota Pollution Control Agency  
Land and Water Quality Permits Section  
Industrial Division

If you have questions on this permit, including the specific permit requirements, permit reporting or permit compliance status, please contact:

**Minnesota Pollution Control Agency**  
**Industrial Division**  
520 Lafayette Road North  
St. Paul, MN 55155-4194  
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**Required Submittals**

**316(b) Required Submittals\*:**

Source water physical data required by 316(b) Phase II .....	October 28, 2006
Cooling water intake structure data.....	October 28, 2006
Cooling water system data.....	October 28, 2006
Proposal for Information Collection .....	October 28, 2006
Comprehensive Demonstration Study.....	October 28, 2006
Results of IM &E Study.....	October 28, 2006
Design Construction Technology Plant.....	October 28, 2006
Technology Installation and Operation Plan .....	October 28, 2006
Verification Monitoring Plan.....	October 28, 2006

*\*The Permittee has tentatively selected Compliance Alternative (2) of 40 CFR 125.94 (a) to meet the impingement and entrainment reduction requirements. Alternative (2) requires that the Permittee demonstrate that existing design and construction technologies, operational measures, and/or restoration measures meet the impingement mortality and entrainment performance standards.*

**Other Submittals:**

Storm water pollution prevention plan.....	180 days after permit issuance
DMRs .....	21 days after the end of each calendar month following permit issuance
Application of permit reissuance .....	180 days before permit expiration

### Permitted Facility Description

This facility is a two unit nuclear fueled electric-generating plant. Both units use a pressurized water reactor system design with a maximum Nuclear Regulatory Commission (NRC) licensed power level of 1650 megawatts thermal per unit, which is equivalent to a combined maximum generating capacity of approximately 1100 megawatts electric for the facility. The treatment and disposal systems at the plant consist of a chemical treatment system, a reverse osmosis system, a radioactive waste (radwaste) treatment system, an intake screening system, and cooling towers. Water is withdrawn from wells for plant process uses, and from the river for condenser/circulating water system and cooling water systems. The condenser/circulating water system provides high volume cooling water flow for the turbine-condenser steam cycle whenever a unit is operating and also allows for excess heat rejection when a nuclear unit is at thermal power with the generator off-line. The cooling water system supplies other plant equipment, such as pumps, motors, and heat exchangers and is normally operated at all times.

The plant discharges condenser/circulating water and cooling water to the Mississippi River via the condenser/circulating water system discharge canal through surface discharge SD 001. During the winter months, a portion of the warm water from the discharge canal is returned to the intake screenhouse via a de-icing line to prevent ice build-up on the bar racks and traveling screens. The plant discharges steam generator blowdown through surface discharge SD 002. Radwaste treatment system effluent is discharged through surface discharge SD 003. The reverse osmosis (RO) system effluent is discharged through surface discharge SD 004. The unit 1 and unit 2 turbine building sumps, which are comprised of noncontact cooling water, condensate traps and drains, roof and floor drains, unit 1 and 2 condensate blowdown and the heating system blowdown, are discharged through surface discharges SD 005 and SD 006. Miscellaneous plant floor drains are discharged through surface discharge SD 010. All of the above surface discharges (SD) are ultimately discharged to the river via the circulating water system discharge canal, SD 001.

The plant intake screen backwash is discharged via SD 012. The fish return system which collects impinged fish, aquatic organisms, and debris off the vertical traveling screens is also discharged via SD 012. SD 012 discharges directly to the river.

The plant has two internal waste streams, the Unit 1 and Unit 2 cooling water systems. These systems are treated routinely with bromine and/or chlorine to control biofouling organisms and, when being treated, are designated as waste streams WS 001 and WS 002. Bromine and/or chlorine residuals are limited in accordance with this permit. Since WS 001 and WS 002 are comprised of cooling water system flow(s) at the time of treatment, these internal waste streams are also discharged to the river via the circulating water system at SD 001.

The plant also has an on land treatment and disposal system, typically referred to as the “land-lock drainage system.” The land-lock drainage system is used for periodic disposal and treatment of turbine building sump discharges when the total suspended solids and oil and grease residual of the sump water is such that it exceeds applicable discharge limitations. The system consists of an approximately 500 ft long, 10 ft wide drainage trench which allows for treatment/filtration of collected water through a semi-permeable clay liner system. Reconstructed in 1998, the drainage trench does not discharge to surface waters, and accumulated water either evaporates or seeps away. Turbine building sump discharges to the land-lock drainage system are primarily composed of river water/sediment and solids.

The plant uses a number of chemical additives for various purposes within the plant systems and piping and may discharge residual concentrations of these additives via the surface discharges. The concentrations of any additives used that may contribute to a discharge have been reviewed and approved by the MPCA (reference NPDES Limits Matrix dated November 1, 2004) and are restricted accordingly. Any new chemical additive usage or increase in dosages used requires approval by the MPCA in accordance with Chapter 7 of this permit.

The plant is limited in the amount of heat it may discharge to the river. The thermal limitations regulating the plant cooling water discharge are described in Chapter 5 part 2 Applicable Effluent Limitations – Thermal Limitations. The plant’s heat discharge or thermal load to the river is limited by mixed river temperature immediately below Lock and Dam No. 3, downstream of the plant. Cooling tower operation is sometimes required to meet the thermal limitations. To determine the ambient river water temperature, assess the plant’s thermal input, and assure compliance with applicable thermal limitations, temperature monitoring is conducted at SD 001 (condenser/circulating water and cooling water discharge canal outfall), at the plant intake (SW 002), at the main river channel (SW 003-upstream river point), at a point(s) in Sturgeon Lake (SW 004-upstream river point), and immediately downstream of Lock and Dam No. 3 by three separate temperature probes (SW 001).

The plant is also regulated by the amount of river water that may be used for condenser and equipment cooling. The design of the various plant cooling systems does not allow for direct measurement or river intake flow but does allow for calculation of discharge flow SD 001 based on sluice gate positions and canal water elevation. River water withdrawal rates are controlled indirectly by imposing limitations on discharge flow at SD 001, which approximates intake flow. The discharge flows are limited from April 15 through June 30 in order to minimize the impingement of fish and fish larvae, as stated in Chapter 1, Part 5.1. The plant must operate the intake screening system throughout the year as required in Chapter 5, Parts 4.1 and 4.2 to assure impinged fish are returned to the river via the fish return system. In addition, during the period April 1 through August 31, the plant is required to operate the intake vertical traveling screens using the fine mesh screen material in order to minimize entrainment of larval fish, fish eggs, and other aquatic organisms.

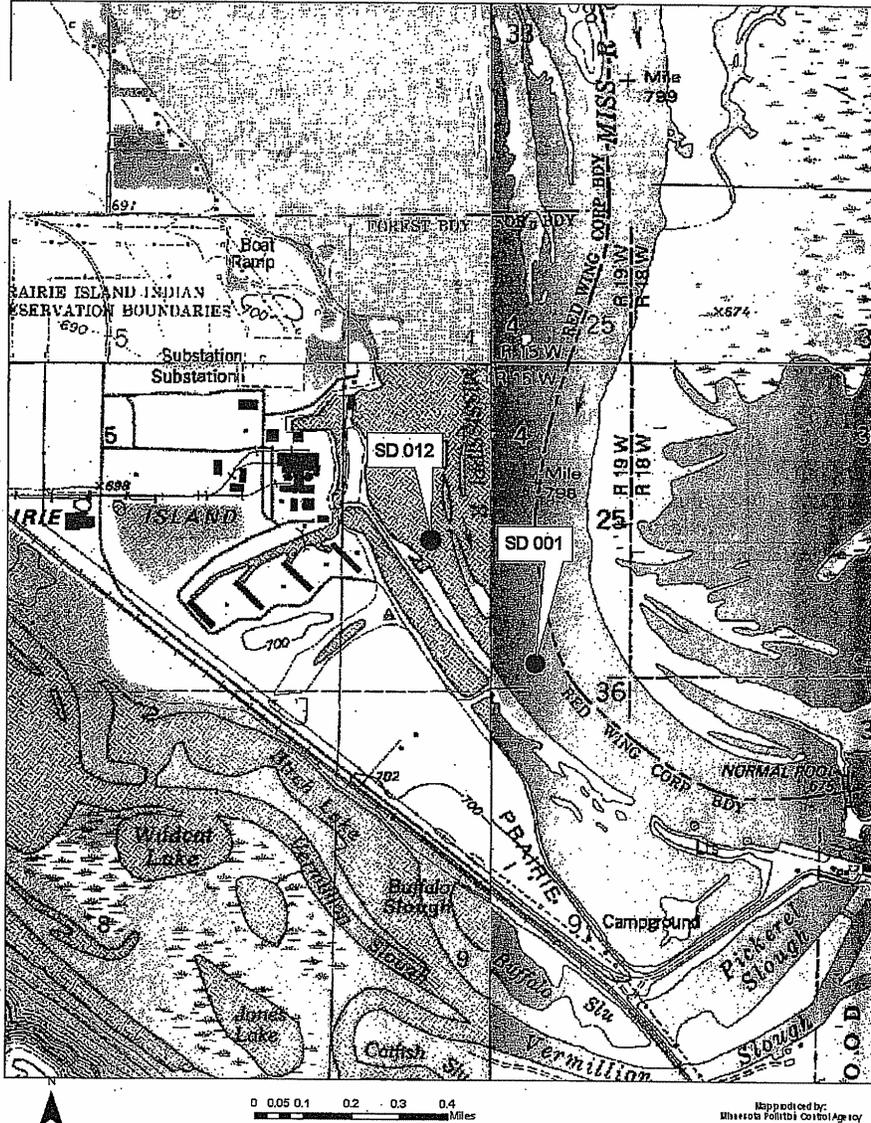
Sanitary wastewater generated at the plant is treated using the plant's septic system or trucked to Red Wing WWTP or Prairie Island Community Water Treatment Plant.

The surface discharge (SD) and internal waste stream (WS) discharges from the plant are described in the following table, with approximate flows in million gallons per day (MGD):

DISCHARGE	WASTEWATER SYSTEM	MAXIMUM FLOW	AVERAGE FLOW
SD 001	Condenser/Circulating Water and Cooling Water	864	503
SD 002	Steam Generator Blowdown	0.576	0.012
SD 003	Radioactive Waste Effluent	0.230	0.002
SD 004	Reverse Osmosis Effluent	0.244 <sup>1</sup>	0.051 <sup>1</sup>
SD 005	Unit 1 Turbine Building Sump	0.360	0.030
SD 006	Unit 2 Turbine Building Sump	0.360	0.030
SD 010	Miscellaneous Plant Floor Drains	0.015	0.001
SD 012	Intake Screen Backwash and Fish Return	3.2	2.0
WS 001	Combined Unit 1 and Unit 2	69	25
WS 002	Cooling Water (when subject to oxidation)		

Note: <sup>1</sup> Flows are based on available data for 3 months of system operation in 2005

The location of the facility and the selected monitoring stations is shown on the map below.  
**Topographic Map of Permitted Facility**



**Prairie Island Nuclear Generating Plant  
License Renewal Application  
Appendix E – Environmental Report**

Permit Modified: June 30, 2006  
Permit Expires: August 31, 2010

**Xcel - Prairie Island Nuclear Generatin  
Limits and Monitoring Requirements**

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Permit #: MN0004006

The Permittee shall comply with the limits and monitoring requirements as specified below.

**SD 001: Condenser Circ Water & Cooling Water Sys (Applicable only during discharge)**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Chlorine Rate	Monitor Only	kg/day	Daily Maximum	Jan-Dec	Calculation	1 x Day	2
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Measurement	1 x Day	1
Flow	Monitor Only	mgd	Daily Average	Jul-Mar	Measurement	1 x Day	1
Flow	97	mgd	Daily Average	Apr	Measurement	1 x Day	13
Flow	194	mgd	Daily Average Intervention	Apr	Measurement	1 x Day	12
Flow	194	mgd	Daily Average Intervention	May	Measurement	1 x Day	4
Flow	259	mgd	Daily Average	Jun	Measurement	1 x Day	15
Flow	517.5	mgd	Daily Average Intervention	Jun	Measurement	1 x Day	14
Oxidants, Total Residual (Bromine), Continuous	0.001	mg/L	Daily Maximum	Jan-Dec	Calculation	1 x Day	
Oxidants, Total Residual (Bromine), Intermittent	0.05	mg/L	Instantaneous Maximum	Jan-Dec	Grab	1 x Day	
Oxidants, Total Residual (Chlorine), Continuous	0.04	mg/L	Daily Maximum	Jan-Dec	Calculation	1 x Day	
Oxidants, Total Residual (Chlorine), Intermittent	0.2	mg/L	Instantaneous Maximum	Jan-Dec	Grab	1 x Day	
pH	9.0	SU	Calendar Month Maximum	Jan-Dec	Grab	1 x Week	17
pH	6.0	SU	Calendar Month Minimum	Jan-Dec	Grab	1 x Week	17
Plant Capacity Factor, Percent of Capacity	Monitor Only	%	Calendar Month Average	Jan-Dec	Measurement	1 x Day	
Temperature, Water	Monitor Only	Deg F	Single Value	Jan-Dec	Measurement, Continuous	1 x Day	7

**SD 002: Steam Generator Blowdown Discharge**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Estimate	1 x Month	
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Estimate	1 x Month	
Solids, Total Suspended (TSS)	65.3	kg/day	Calendar Quarter Average	Jan-Dec	Grab	1 x Quarter	
Solids, Total Suspended (TSS)	30	mg/L	Calendar Quarter Average	Jan-Dec	Grab	1 x Quarter	
Solids, Total Suspended (TSS)	217.0	kg/day	Daily Maximum	Jan-Dec	Grab	1 x Quarter	
Solids, Total Suspended (TSS)	100	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Quarter	

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Limits and Monitoring Requirements**

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The Permittee shall comply with the limits and monitoring requirements as specified below.

**SD 003: Radwaste Treatment Effluent**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Estimate	1 x Month	
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Estimate	1 x Month	
Solids, Total Suspended (TSS)	26.0	kg/day	Calendar Quarter Average	Jan-Dec	Grab	1 x Quarter	
Solids, Total Suspended (TSS)	30	mg/L	Calendar Quarter Average	Jan-Dec	Grab	1 x Quarter	
Solids, Total Suspended (TSS)	86.9	kg/day	Daily Maximum	Jan-Dec	Grab	1 x Quarter	
Solids, Total Suspended (TSS)	100	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Quarter	

**SD 004: Reverse Osmosis Effluent**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Estimate	1 x Month	
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Estimate	1 x Month	

**SD 005: Unit 1 Turbine Bldg Sump Dschg**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Estimate	1 x Month	
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Estimate	1 x Month	
Oil & Grease, Total Recoverable (Hexane Extraction)	10	mg/L	Calendar Month Average	Jan-Dec	Grab	1 x Month	
Oil & Grease, Total Recoverable (Hexane Extraction)	15	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Month	
Solids, Total Suspended (TSS)	30	mg/L	Calendar Month Average	Jan-Dec	Grab	1 x Month	16
Solids, Total Suspended (TSS)	100	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Month	16

**SD 006: Unit 2 Turbine Bldg Sump Dschg**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Estimate	1 x Month	
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Estimate	1 x Month	
Oil & Grease, Total Recoverable (Hexane Extraction)	10	mg/L	Calendar Month Average	Jan-Dec	Grab	1 x Month	
Oil & Grease, Total Recoverable (Hexane Extraction)	15	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Month	
Solids, Total Suspended (TSS)	30	mg/L	Calendar Month Average	Jan-Dec	Grab	1 x Month	16

**Prairie Island Nuclear Generating Plant  
License Renewal Application  
Appendix E – Environmental Report**

Permit Modified: June 30, 2006  
Permit Expires: August 31, 2010

**Xcel - Prairie Island Nuclear Generating  
Limits and Monitoring Requirements**

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The Permittee shall comply with the limits and monitoring requirements as specified below.

**SD 006: Unit 2 Turbine Bldg Sump Dschg**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Solids, Total Suspended (TSS)	100	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Month	16

**SD 010: Misc Plant Floor Drains Discharge**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Quarter Average	Jan-Dec	Estimate	1 x Quarter	
Flow	Monitor Only	MG	Calendar Quarter Total	Jan-Dec	Estimate	1 x Quarter	
Oil & Grease, Total Recoverable (Hexane Extraction)	10	mg/L	Calendar Quarter Average	Jan-Dec	Grab	1 x Quarter	
Oil & Grease, Total Recoverable (Hexane Extraction)	15	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Quarter	
Solids, Total Suspended (TSS)	30	mg/L	Calendar Quarter Average	Jan-Dec	Grab	1 x Quarter	16
Solids, Total Suspended (TSS)	100	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Quarter	16

**SD 012: Intake Screen Backwash + Fish Retn**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Estimate	1 x Month	
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Estimate	1 x Month	3

**SW 001: Mississippi River Below Lock & Dam #3**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Temperature Difference Between Sample & Reference Point	5	Deg F	Monthly Average of Daily Maximum	Apr-Oct	Measurement, Continuous	1 x Day	9
Temperature, Water	86	Deg F	Daily Average	Jan-Dec	Measurement, Continuous	1 x Day	8
Temperature, Water	43	Deg F	Daily Average Intervention	Nov-Mar	Measurement, Continuous	1 x Day	5
Temperature, Water	43	Deg F	Daily Average Intervention	Apr-Oct	Measurement, Continuous	1 x Day	10

**SW 002: Plant Intake Channel**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Temperature, Water	Monitor Only	Deg F	Single Value	Jan-Dec	Measurement, Continuous	1 x Day	8

**Prairie Island Nuclear Generating Plant  
License Renewal Application  
Appendix E – Environmental Report**

Permit Modified: June 30, 2006  
Permit Expires: August 31, 2010

**Xcel - Prairie Island Nuclear Generating  
Limits and Monitoring Requirements**

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Permit #: MN0004006

The Permittee shall comply with the limits and monitoring requirements as specified below.

**SW 003: Main River Channel Upstream Pt.**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Temperature, Water	Monitor Only	Deg F	Single Value	Jan-Dec	Measurement, Continuous	1 x Day	8

**SW 004: Sturgeon Lake - Upstream Pt.**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Temperature, Water	Monitor Only	Deg F	Single Value	Jan-Dec	Measurement, Continuous	1 x Day	8

**WS 001: Unit 1 Cooling Water Discharge**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Measurement, Continuous	1 x Day	6
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Measurement, Continuous	1 x Day	6
Oxidants, Total Residual	2.0	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Day	11

**WS 002: Unit 2 Cooling Water Discharge**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan-Dec	Measurement, Continuous	1 x Day	6
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Measurement, Continuous	1 x Day	6
Oxidants, Total Residual	2.0	mg/L	Daily Maximum	Jan-Dec	Grab	1 x Day	11

Permit Modified: June 30, 2006  
Permit Expires: August 31, 2010

**Xcel - Prairie Island Nuclear Generating  
Limits and Monitoring Requirements**

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The Permittee shall comply with the limits and monitoring requirements as specified below.

Notes:

- 1 -- Determined using flow curve and sluice gate position, see Chapter 9, Part 1.28.
- 2 -- During intermittent treatment, the discharge of total residual oxidants shall be limited to a total of 2 hours per 24 hour period. The Permittee shall monitor the amount and time of oxidant application and shall report it monthly.
- 3 -- Large debris collected at the trash racks shall be disposed of so as to prevent it from entering waters of the state
- 4 -- May exceed this flow limit if needed to keep from exceeding 85 degree F condenser inlet temperature operating limit provided that flow is minimized and cooling towers are operating to the maximum extent possible.
- 5 -- Once the temperature in the receiving water falls below 43 degrees F for five consecutive days the discharge shall not raise the temperature of the receiving water above 43 degrees for an extended period of time. If the temperature in the river is greater than 43 degrees F for two consecutive days the Permittee shall notify the MPCA. This limit applies until the ambient river temperature increases to 43 degrees F or above for 5 consecutive days or until April 1, whichever occurs first. The Permittee shall submit the daily maximum, daily average, and daily minimum temperature collected at each of the three monitoring probes located on the dividing piers at Lock and Dam No. 3 with the monthly DMR.
- 6 -- See Chapter 3 for data collection and reporting.
- 7 -- See Thermal Limitations in Chapter 5.
- 8 -- See applicable sections in Chapter 2 and 5 for thermal limitations and data collection requirements.
- 9 -- Starting April 1 the discharge shall not raise the temperature of the receiving water greater than 5 degrees F above the ambient water temperature based on the monthly averages of maximum daily temperatures at the three monitoring probes (reference point) located on the piers dividing Lock and Dam No. 3. This limit applies until such a point when the daily average temperature of the receiving water is less than 43 degrees F for 5 consecutive days.
- 10 -- Starting April 1 the discharge shall not raise the temperature of the receiving water greater than 5 degrees F above the ambient water temperature. This limit applies until such a point when the daily average temperature of the receiving water is less than 43 degrees F for 5 consecutive days. The Permittee shall submit the daily maximum, daily average, and daily minimum temperature for each of the three monitoring probes located on the dividing piers at Lock and Dam No. 3 with the monthly DMR.
- 11 -- The Permittee shall monitor SD 001 for total residual oxidant and be subject to the limitations as described in the Limits and Monitoring requirements for SD 001.
- 12 -- This limit applies from April 15 -30 when the flow in the receiving water is greater than or equal to 15,000 cfs. May exceed this flow limit if needed to keep from exceeding the 85 degree F condenser inlet temperature operating limit provided that flow is minimized and cooling towers are operating to maximum extent possible.
- 13 -- This limit applies from April 15 -30 when the flow in the receiving water is less than 15,000 cfs. May exceed this flow limit if needed to keep from exceeding the 85 degree F condenser inlet temperature operating limit provided that flow is minimized and cooling towers are operating to maximum extent possible.
- 14 -- This limit applies from June 16 - 30. May exceed this flow limit if needed to keep from exceeding 85 degree F condenser inlet temperature operating limit provided that flow is minimized and cooling towers are operating to the maximum extent possible.
- 15 -- This limit applies from June 1- 15. May exceed this flow limit if needed to keep from exceeding 85 degree F condenser inlet temperature operating limit provided that flow is minimized and cooling towers are operating to the maximum extent possible.
- 16 -- Where the background level of natural origin is reasonably definable and normally is higher than the specified limits for total suspended solids (average and maximum), the natural level may be used as the limit.
- 17 -- pH limit is not subject to averaging and shall be met at all times

## Chapter 1. Surface Discharge Stations

### 1. Sampling Location

- 1.1 Samples taken in compliance with monitoring requirements specified for surface discharge SD 001 shall be taken at a point representative of the discharge. Samples taken in compliance with monitoring requirements for outfalls 002, 003, 004, 010, and 012 shall be taken at a point representative of the discharge prior to mixing with other waste streams. Samples taken in compliance with monitoring requirements for outfalls 005 and 006 shall be taken at a point representative of the discharge prior to mixing with other waste streams, and samples shall be taken at each outfall.

### 2. Surface Discharges

- 2.1 Oil or other substances shall not be discharged in amounts that create a visible color film.
- 2.2 There shall be no discharge of floating solids or visible foam, except that which occurs naturally in the river, in other than trace amounts.
- 2.3 The Permittee shall install and maintain outlet protection measures at the discharge stations to prevent erosion if necessary.

### 3. Discharge Monitoring Reports

- 3.1 The Permittee shall submit monitoring results for discharges in accordance with the limits and monitoring requirements for this station. If no discharge occurred during the reporting period, the Permittee shall check the "No Discharge" box on the Discharge Monitoring Report (DMR).

### 4. Requirements for Specific Stations

- 4.1 SD 001: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 4.2 SD 002: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 4.3 SD 003: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 4.4 SD 004: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 4.5 SD 005: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 4.6 SD 006: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 4.7 SD 010: Submit a quarterly DMR quarterly by 21 days after the end of each calendar quarter following permit issuance.
- 4.8 SD 012: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.

### 5. Special Requirements

#### Discharge Operations

Permit Modified: June 30, 2006  
Permit Expires: August 31, 2010

Xcel - Prairie Island Nuclear Generating

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Permit #: MN0004006

## Chapter 1. Surface Discharge Stations

### 5. Special Requirements

- 5.1 The plant cooling water discharge flows in million gallons per day (mgd) shall be limited as follows during the specified periods:

April 15 - 30: 194 mgd if the flow in the river is at or above 15,000 cfs  
97 mgd if the flow in the river is below 15,000 cfs  
May 1 - 31: 194 mgd  
June 1 - 15: 259 mgd  
June 16-30: 517.5 mgd

- 5.2 The plant may discharge water at SD 001 at higher flow rates during the specified period if needed to prevent condenser inlet temperatures from exceeding 85 degree F provided that such higher flows are minimized to the extent practical, and all cooling towers are operated to the maximum practical extent.

#### 316(b) Demonstration

##### Source Water Physical Data, Cooling Water Intake Structure Data, Cooling Water System Data

- 5.3 The Permittee shall submit the source water physical data, cooling water intake structure data, and cooling water system data in accordance with the NPDES Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, published July 9, 2004 in the Federal Register pursuant to 316(b) of the Clean Water Act, 40CFR Parts 9, 122, 123, 124, and 125.

The data shall be submitted by October 28, 2006.

#### 316(b) Proposal for Information Collection and Comprehensive Demonstration Study Requirements

- 5.4 The Permittee has tentatively selected Compliance Alternative (2) of 40CFR 125.94 (a) to meet the impingement and entrainment reduction requirements. Alternative (2) requires that the Permittee demonstrate that existing design and construction technologies, operational measures, and/or restoration measures meet the impingement mortality and entrainment performance standards.
- 5.5 The Permittee shall submit a Proposal for Information Collection in accordance with the NPDES Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities by October 28, 2006.
- 5.6 The Permittee shall submit a comprehensive demonstration (CDS) study in accordance with 316(b) of the Clean Water Act, 40CFR Parts 9, 122, 123, 124, and 125. The 316(b) demonstration study elements, further described below, shall be implemented to assure that the location, design, construction, and capacity of the cooling water intake structure at the plant reflect the best technology available (BTA) for minimizing adverse environmental impact.

The 316(b) CDS shall demonstrate that the implementation and/or operation of technology and operational measures will reduce cooling water intake impingement mortality of all life stages of fish and shellfish by 80 to 95 percent and will reduce entrainment by 60 to 90 percent from the baseline calculation, based on the 316(b) performance requirements for a freshwater river.

The Permittee shall submit the CDS by October 28, 2006.

#### 316(b) Demonstration Impingement Mortality and Entrainment (IM&E) Characterization Study (baseline development)

## Chapter 1. Surface Discharge Stations

### 5. Special Requirements

- 5.7 The Permittee shall submit the results of an Impingement Mortality and Entrainment Characterization Study (IM&E Study). The study shall provide information to support the development of a calculation baseline for evaluating impingement mortality and entrainment consistent with the 316(b) rule. The Permittee may update the study upon request to, and approval by, the MPCA.

All field sampling shall be conducted under present normal plant operating conditions, screen rotation, and plant flows. Documentation shall be maintained of plant operations during sampling. All species impinged shall be identified, with weight and length measurements taken to the extent feasible. Data from historical studies may be included in the calculation of baseline impingement and entrainment if deemed relevant and appropriate.

- 8 The IM&E Study shall include the following in accordance with the 316(b) requirements:

- a. Taxonomic identifications of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure and are susceptible of impingement and entrainment.
- b. A characterization of all life stages of fish, shellfish, and any species protected under Federal, State, and Tribal Law (including threatened or endangered species) identified pursuant to paragraph a. above, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s), based on sufficient data to characterize annual, seasonal, and diel variations in impingement mortality and entrainment (e.g. related to climate and weather differences, spawning, feeding, and water column migration). These may include historical data that are representative of the current operation and biological conditions at the site.
- c. Documentation of the current impingement mortality of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal Law (including threatened or endangered species) identified pursuant to paragraph a. above and an estimate of impingement mortality and entrainment to be used as a baseline.

- 5.9 The Permittee shall submit the results of the IM&E study, by October 28, 2006. The submittal shall describe the calculated baseline for impingement mortality and entrainment and verify the calculated baseline based on the total acquired impingement and entrainment data.

#### **316(b) Demonstration Design and Construction Technology Plan**

- 5.10 The Permittee shall submit a Design and Construction Technology Plan (DCT Plan) to the MPCA for review and approval. The DCT Plan shall describe the technologies and/or operational measures in place and/or selected to meet the impingement and entrainment performance requirements in the 316(b) Rule, 125.94.

- 5.11 The DCT Plan shall include the following information in accordance with 316(b) Rule requirements:

- a. A narrative description of the design and operation of all design and construction technologies and/or operational measures (existing and proposed), including fish handling and return systems, that are in place or will be used to meet the requirements to reduce impingement mortality and entrainment of those species expected to be most susceptible, and information that demonstrates the efficacy of the technologies and/or operational measures for those species. A complete narrative description is contained in the NPDES permit application.
- b. Calculations of the reduction in impingement mortality and entrainment of all life stages of fish and shellfish that would be achieved by the technologies and/or operational measures selected, based on the IM&E study. The total reduction in mortality must be assessed against the calculation baseline.
- c. Design and engineering drawings, and calculation results and descriptions, prepared by a qualified professional to support the descriptions required by paragraph a. above.

## Chapter 1. Surface Discharge Stations

### 5. Special Requirements

- 5.12 The DCT Plan shall be submitted to the MPCA for review and approval by October 28, 2006.

#### **316(b) Demonstration Technology Installation and Operation Plan**

- 5.13 A Technology Installation and Operation Plan (TIO Plan) shall be submitted for MPCA review and approval. The TIO Plan shall include the following in accordance with 316(b) Rule requirements:
- A schedule for the maintenance of any new design and construction technologies. The technology installation shall be reasonably scheduled to ensure that impacts to energy reliability and supply are minimized.
  - List of operational and other parameters to be monitored, and the locations and frequency for monitoring.
  - List of activities to be undertaken to ensure to the degree practicable the efficacy of installed design and construction technologies and operational measures, and the schedule for implementation.
  - A schedule and methodology for assessing the efficacy of any installed design and construction technologies and operational measures in meeting applicable performance standards or site specific requirements, including an adaptive management plan for revising design and construction technologies, operational measures, operation and maintenance requirements, and/or monitoring requirements if the assessment indicates that applicable performance standards (impingement mortality and entrainment reductions) are not being met.
- 5.14 The TIO Plan shall be submitted to the MPCA for review and approval by October 28, 2006. The Permittee shall meet the terms of the TIO Plan in accordance with MPCA approval of the TIO Plan, including any revisions to the adaptive management plan component of the TIO Plan that may be necessary should applicable performance standards (impingement mortality and entrainment reductions) not be met.

#### **316(b) Demonstration Verification Monitoring Plan**

- 5.15 The Permittee shall submit a Verification Monitoring Plan (VM Plan) to the MPCA for review and approval. The VM Plan shall describe the monitoring to be conducted over a period of 2 years designed to verify that the full-scale performance of the proposed or already implemented technologies and/or operational measures are successful in meeting the performance standards (applicable impingement mortality and entrainment reductions). The VM Plan shall provide the following:
- Description of the frequency and duration of monitoring, the parameters to be monitored, and the basis for determining the parameters and the frequency and duration of monitoring. The parameters selected and duration and frequency of monitoring shall be consistent with any methodology for assessing success in meeting applicable performance standards in the TIO Plan. The method for assessment of success shall be specified including the averaging period for determining the percent reduction in impingement mortality.
  - A proposal on how naturally moribund fish and shellfish that enter the cooling water intake structure would be identified and taken into account in assessing success in meeting the performance standard.
  - A description of the information to be included in a subsequent biennial status report to the MPCA.
- 5.16 The VM Plan shall be submitted to the MPCA by October 28, 2006.

## Chapter 1. Surface Discharge Stations

### 5. Special Requirements

- 5.17 Verification monitoring in accordance with the VM Plan shall be conducted for a period of 2 years to demonstrate whether the design and construction technology and/or operational measures meet the applicable performance standard (impingement mortality and entrainment reduction). A final report on verification monitoring shall be submitted to the MPCA within 120 days of completion of verification monitoring. The MPCA may approve a change to the plan at any time. The plan elements and procedures shall be followed as described in the latest approved version of the plan. The Permittee may make changes to the studies and plan upon request to, and approval by, the MPCA.

#### **316(b) Demonstration Records**

- 5.18 The Permittee shall maintain records of significant data used to develop the IEM, TIO Plan, VM Plan; records regarding compliance with the requirements of the 316(b) Rule; and any compliance monitoring data for a period of at least 5 years from permit issuance.

#### **316(b) Demonstration Biennial Status Report**

- 5.19 The Permittee shall submit a biennial status report beginning July 1, 2011 to the MPCA. The biennial status report shall summarize monitoring data and other information relevant to performance of the installed technology and/or operation measures. Other information shall include summaries of significant operation and maintenance records and summaries of adaptive management activities, or other information relevant to determining compliance with the facility's TIO Plan.

## Chapter 2. Surface Water Stations

### 1. Sampling Location

- 1.1 Temperature monitoring for SW Station 001 shall be taken by 3 separate probes located immediately downstream of Lock and Dam No. 3 on three piers dividing the four gated sections of the dam. Individual temperature (maximum, average, and minimum) data from each probe shall be collected and submitted. Compliance with the 5 degree F maximum allowable increase at SW 001 shall be based on the monthly average of the daily maximum temperature at the three probes. Temperature monitoring for SW Station 002 shall be taken at a point in the intake channel representative of river water temperature unaffected by the plant thermal discharge. Temperature monitoring for SW Station 003 shall be taken in the main river channel at a point unaffected by the plant thermal discharge. Temperature monitoring for SW Station 004 shall be taken in Sturgeon Lake at one or more points unaffected by the plant for thermal discharge.

### 2. Discharge Monitoring Reports

- 2.1 The Permittee shall submit monitoring results in accordance with the limits and monitoring requirements for this station. If flow conditions are such that no sample could be acquired, the Permittee shall check the "No Flow" box and note the conditions on the Discharge Monitoring Report (DMR).
- 2.2 For parameters required to be monitored continuously, portions of the monitoring data will occasionally be lost when equipment is out of service for repairs or while performing routine instrument calibrations and maintenance. In such cases, loss of one hour or less of data in a calendar day need not be reported unless the Permittee has reason to believe that resulting values reported on the DMR are not representative of actual conditions.

### 3. Requirements for Specific Stations

- 3.1 SW 001: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.

## Chapter 2. Surface Water Stations

### 3. Requirements for Specific Stations

- 3.2 SW 002: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 3.3 SW 003: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.
- 3.4 SW 004: Submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.

### 4. Special Requirements

#### Exceedance of Permit Thermal Limitations Under Energy Emergencies

- 4.1 The thermal limitations of this permit may be exceeded for a limited period under extreme conditions of electrical energy emergencies. Exceedance of the thermal limitations may occur only during electrical energy emergencies. For purposes of this permit an "electrical energy emergency" is defined as the time period when Northern States Power Company's, d/b/a Xcel Energy (Permittee or Xcel Energy); generating system is in System Conditioning Operating Code Red, or when in System Code Orange (danger) if degradation to Code Red appears likely absent corrective action.
- 4.2 System Code Red (emergency) occurs when the energy supply is subject to, but not limited to, partial power interruptions, curtailment of energy supply to controlled customers and peak controlled customers, power interruption to commercial customers, and reduction of peak voltage. It represents a situation where all electrical reserves have been exhausted, the electrical grid is unstable, and electrical demand has exceeded electrical supply. Code Red is also commonly referred to as a "brown-out". A Code Red may also lead to interruption to retail customers and power interruption, commonly referred to as a rotating "black-out".

System Code Orange (danger) occurs when the entire electrical system is vulnerable to instability due a single failure, such as a potential transmission fault, loss of a generating unit, or other technical failure. It represents a situation where electric power demand is currently being met but utility equipment is being operated at or near maximum dependable capacity and remaining energy reserves are extremely low or non-existent. Under Code Orange energy controlled customers and energy peak customers are being curtailed, external energy is unavailable, and loss of an Xcel electrical generating unit or external purchase would result in Xcel being unable to meet required NERC (North American Electric Reliability Council) operating requirements.

- 4.3 Thermal limitation exceedances may occur only under the following conditions:

1. Thermal limitation exceedances will only be considered under an electrical energy emergency. Xcel Energy shall base decisions regarding thermal limitation exceedances on engineering and operational measures necessary to maintain stable regional energy supplies and protect critical generation and transmission equipment. Xcel Energy shall take all reasonable corrective actions available to avoid thermal limitation exceedances.
2. Thermal limitation exceedances are allowable only after Xcel Energy has exhausted all other reasonable alternatives or determined them to be inadequate. These alternatives include, but are not limited to, use of all available Xcel Energy power generation including Xcel Energy oil burning facilities and reserves, energy purchases, demand side management measures, curtailment of non-essential auxiliary load, and public appeals for voluntary energy conservation measures. Energy costs, either incurred at Xcel Energy generating facilities or through energy purchased, shall not be a factor in exhausting these alternatives.
3. Xcel Energy shall restore operations to return to compliance with permit thermal limitations as soon as possible upon termination of the electrical energy emergency, that is, upon return to a stable system Code Orange (danger) or better system code. The duration of thermal limitation exceedances shall be minimized.

## Chapter 2. Surface Water Stations

### 4. Special Requirements

#### 4.4

4. Xcel Energy shall limit the severity of thermal limitation exceedances to the extent possible. Xcel Energy shall maintain any existing cooling tower systems and other cooling systems used to remove heat from cooling water to be discharged, so that these cooling systems are completely available during energy emergencies.

5. Xcel Energy shall attempt to notify the MPCA in advance of its intent to exercise this provision to exceed the permit thermal limitations under an electrical energy emergency. If Xcel Energy is unable to provide advance notification, due to sudden problems caused by storms, unplanned loss of critical generation or transmission, or similar circumstances causing conditions to rapidly deteriorate, Xcel Energy shall notify MPCA staff as soon as possible after the initial response actions are completed. If the event occurs after normal business hours or a weekend Xcel Energy shall notify the State Duty Officer and provide follow up notification to MPCA the next business day.

6. Xcel Energy shall institute monitoring for any environmental impacts during exceedances of the thermal limitations. Specifically Xcel Energy shall institute periodic biological observations of the zone of influence of the thermal discharge on the receiving water and any plant discharge canal, to monitor for signs of dead or distressed fish and other aquatic life. Any dead or distressed fish observed shall be tabulated and recorded by Xcel Energy staff and reported within one day, or the next business day if on a weekend, to the MPCA and the Minnesota Department of Natural Resources (MDNR). Xcel Energy shall submit a monitoring plan for biological observations during electrical energy emergencies, within 30 days after issuance of this permit.

#### 4.5

7. Xcel Energy shall comply with the Minnesota Department of Natural Resources (MDNR) requirements concerning any costs or charges levied by the MDNR for fish or other aquatic organisms lost due to any thermal limitation exceedances.

8. Unless otherwise specified by the MPCA, during an electrical energy emergency Xcel Energy shall provide a daily summary of the status of plant operations, the nature and extent of any permit deviations or exceedances of the thermal limitations, any mitigating actions being taken, and any observed environmental impacts. The daily summaries shall be provided by telephone and e-mail message to the MPCA during business days. Daily summaries during the weekend shall be provided by e-mail message.