Year	2003	2004	2005	2006	2007
Reported	41.9 MGY 128.63 acre ft 79.72 gpm	54.6 MGY 167.62 acre ft 103.60 gpm	61.6 MGY 189.11 acre ft 117.20 gpm	58.6 MGY 179.90 acre ft 111.49 gpm	44.8 MGY 137.53 acre ft 85.24 gpm

MGY = million gallons per year , gpm =gallons per minute

Table 1-1: PINGP Reported Pumping Permit Appropriation

Stream	Description	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 (Monitoring and Reporting requirements only)	0.244	0.051
SD 005	U 1 Turbine Building sump	0.360	0.030
SD 006	U 2 Turbine Building sump	0.360	0.030
SD 010	Misc Plant Floor Drains	0.015	0.001
SD 012	Intake Screen wash (Monitoring and Reporting Requirements Only)	3.2	2.0
WS 001 & SW 002	Combined U 1/U 2 Cooling water	69	25

Table 1-2: PINGP Surface Water Discharge Streams

Table 1-3: PINGP NPDES Permitted Flow Limits

Dates	Limiting Flow (mgd)	Notes
April 15 to30	97**	River Flow < 15,000 cfs
April 15 to 30	194**	River flow > 15,000 cfs
May 1 to 31	194**	
June 1 to 15	259**	
June 16 to 30	517.5**	
Balance of year	N/A	

NPDES = National Pollution Discharge Elimination, System, mgd = million gallons per day, gpm = gallons per minute, cfs = cubic feet second (cfs).

****** This flow limit may be exceeded if required to maintain condenser inlet temperature to less than 85 F, provided (a) the additional flow to achieve the necessary inlet temperature is minimized, and (b) cooling towers are operating to the maximum extent possible.

Rule Reference	Description	Prairie Island Power Uprate
Capacity		164 MWe
Annual Capacity Factor		• 88.8% during years with refueling outage • 97% during years without refueling outage • Assumes a 3% forced outage rate
Typical Availability		Because nuclear power plants are dispatched and operated whenever they are available, the capacity factor and availability factors are the same.
7849.0250 A (1)	Nominal generating capability	164 MW
7849.0250 A (2)	Operating Cycle	30 day refueling outage every 2 years
Anticipated annual capacity factor		• 88.8% during years with refueling outage • 97% during years without refueling outage • Assumes a 3% forced outage rate
7849.0250 A (3)	Type of fuel used	Uranium
7849.0250 A (3)	Availability of fuel	Both the OECD and IAEA project uranium supplies are adequate to meet the needs of nuclear power plants worldwide, as well as new reactors anticipated in the next decade. The agencies base their conclusion on official projections from 43 uranium-producing countries, as well as independent studies by the agencies.
7849.0250 A (3)	Alternative fuels	None
7849.0250 A (4)	Anticipated heat rate (efficiency) (ISO Conditions)	10.425 mbtu/MWh
7849.0250 C (1)	Capacity Costs In $/kW	$2,011/kW
7849.0250 C (2)	Service Life	2014 to 2034
7849.0250 C (3)	Estimated Average Annual Availability	97%
7849.0250 C (4)	Fuel Costs ($/kWh)	$0.00598kWh
7849.0250 C (5)	Variable Operating And Maintenance Costs ($/kWh)	0.00040 $/kWh
7849.0250 C (6)	Total Cost ($/kWh)	$0.03808/kWh
7849.0250 C (7)	Estimated Effect On Rates System-Wide Assuming Test Year Beginning With Proposed In-Service Date	$0.00103/kWh
7849.0250 C (8)	Efficiency Expressed In Heat Rate	9.94mmBtu /MWh

mbtu = million british thermal units, kWh = kilo watt hour, MWh = mega watt hour

Table 1-4: PINGP EPU Operational Information Summary

Table 3-1: Cost Comparison between the Proposed EPU, a 164 MW Coal PPA, a 164 MW Biomass Plant, and a Natural Gas Plant Present Value of Revenue Requirements (PVRR) Base Case* Assumptions ($ millions)

	Prairie Island Uprate Project	164 MW Coal PPA	164 MW Biomass	Unconstrained
PVRR	**$61,356**	**$61,974**	**$62,535**	**$61,875**
PVRR difference from Prairie Island Project	**-**	**$619**	**$1,179**	**$519**

*The base case uses the same forecast, individual plant information, externality values, and fuel forecasts, and assumes compliance with the RES and DSM legislation.

Table 3-2: Air Emission Comparison between the Proposed EPU, a 164 MW Coal PPA, a 164 MW Biomass Plant, and a Natural Gas Plant

2008 – 2035 Emissions Differences	**NOx** Tons	**PM10** Tons	**CO_2** Tons	**SO_2** Tons	**VOC** Tons	**CO** Tons
Prairie Island Uprate Project	0	0	0	0	0	0
164 MW Coal PPA	24,110	3,158	32,290,370	39,616	578	4,767
164 MW Biomass	103,722	4,701	65,357,790	21,551	837	18,498
"Unconstrained" Natural Gas Combustion Turbine	7,580	1,370	16,059,200	9,526	283	2,235

The table compares differences between the total emissions for the PINGP EPU project and three alternatives. The PINGP EPU project is set at "0" as the baseline, the data showing how much higher or lower other alternatives are.

TABLE 4-1 PREVIOUSLY RECORDED AND REPORTED ARCHAEOLOGICAL SITES WITHIN THE PINGP STUDY AREA

Site No. and Name	Last site visit	Description	Location	Condition (per site form)
Recorded Sites				
21GD0002 Bartron Site	1970	Oneota/Blue Earth phase village on 20 acres	T113 R15W, Sec 4 SW-SW-SW	Moderately disturbed
21GD0058 Birch Lake Mounds (aka Prairie Island Mounds II)	1981	*Possible Burial Site* 8 mortuary mounds on 8.5 acres; Mississippian affiliation	T113N R15W, Sec 5 SW-SW-SE, SE-SE-SW	Unknown Johnson Data Recovery 1969
21GD0059 NSP II	1969	*Possible Burial Site* 6 mounds on 8 acres; Woodland affiliation	T113N R15W, Sec 5, S-NE-SE-SE, N-SE-SE-SE, C-E-WSE-SE	Johnson Data Recovery 1969; Heavily disturbed/ destroyed
21GD0062 Birch Lake Mound	1969	*Possible Burial Site* 1 mound; probable Woodland affiliation	T113N R15W, Sec 5, SE-SW-SE, CE-E-SW-SW-SE	Moderately disturbed
21GD0148 Cooling Tower	1980	Artifact scatter on 5.5 acres; Woodland and probable Mississippian affiliation	T113N R15W, Sec 4, C-S-SW-SW	Minimally disturbed
21GD0149 Substation	1980	*Possible Burial Site* 1 mound and artifact scatter on 3 acres; possible Woodland, probable Oneota affiliation	T113N R15W, Sec 4, SW-NW-NW	Heavily disturbed
21GD0207 Dike Site	1980	Artifact scatter on 1 acre; Woodland affiliation	T113N R15W, Sec 7, C-S-SW-NE SW, C-N-N-NW SW-SW	Unknown
Reported Sites				
21GDl Vergil Larson Mounds II	1999	*Possible Burial Site* – 3 mounds	T113N R15W, Sec 5, E-SW-SW-NW, SW-SE-SW-NW, N-N-NW-SW	Unknown, not field verified

TABLE 4-1 (Cont.) PREVIOUSLY RECORDED AND REPORTED ARCHAEOLOGICAL SITES WITHIN THE PINGP STUDY AREA

Site No. and Name	Description	Location	Condition (per site form)
Minnesota			
21GD0001 Nauer Mound Group	Earthwork, 51 mounds covering 60 acres; Woodland/ Early Oneota affiliation	T113N R15W, Sec 9 NW, NW-NW-SE, NE-NE-SW, SW-SW-SW-NE	Heavily disturbed; perhaps 13 mounds still visible
21GD0060 Vergil Larson Mound I	3 mounds and artifact scatter on 29 acres; probable Woodland affiliation	T113N R15W, Sec 6, SE-NE	Heavily disturbed
21GD0063 Larson Lake Mound	1 mound; probable Woodland affiliation	T113N R15W, N-N-SW-SE, C-S-S-S-NW-SE	Moderately disturbed
21GD0064 Amos Owens Mound Group	1 mound; probable Woodland affiliation	T113N R15W, Sec 6, NW-NE-SE	Disturbed, site location confirmed by testing in 1992
21GD0071 (21GD114) Brink Mound Group *(Mistakenly assigned 2 site numbers)*	4 mounds on 4.5 acres; probable Woodland affiliation	T113N R15W, Sec 6, W-SW-SW	Moderately disturbed
21GD0074 Buffalo Slough Mounds	24 mounds on 46.5 acres; probable Woodland affiliation	T114N R15W, Sec 30 C-SW-SE, S-SE-SE, S-NW-SE-SE	Heavily disturbed; probably destroyed
21GD0075 Leith Mound Group	45 mounds on 28.5 acres; probable Woodland affiliation	T114N R15W, Sec 32, NE-SW, C-W-W-WSE, S-SW-SE-NW	Moderately disturbed; 24 mounds visible in Prairie Island Reservation in 1999
21GD0088 Fort LaJonquire/ Sturgeon Lake Post	Historic French trading post	T114N R15WM Sec 32, SW-SE; overlaps 21GD75	Destroyed
21GD0173 Sturgeon Lake II	Artifact scatter on 1.5 acres; Woodland affiliation	T114N R15W, Sec 32, SW-SE-SE-NW, SE-SW-SE-NW	Undisturbed
21GD0181 Pickeral Slough	Artifact scatter over 3.5 acres; Woodland affiliation	T113N R15W, Sec 9, NE-NW-SE, N-SENW-SE, W-W-NWNE-SE	Minimally disturbed
21GD0189 Rim Site	Artifact scatter; Middle Woodland/Havana affiliation	T114N R15W, Sec 33 SW-NW-SE-NW	Unknown; may be redeposited alluvial material
21GD0202 Prairie Island Marina Site	Lithic scatter; unknown affiliation	T114M R15W, Sec 32NE-SW-NW-NW	Undisturbed

TABLE 4-1 (Cont.) PREVIOUSLY RECORDED AND REPORTED ARCHAEOLOGICAL SITES WITHIN THE PINGP STUDY AREA

Site No. and Name	Description	Location	Condition (per site form)
21GD0208 CSAH 18 Findspot	Single projectile point; precontact	T113N R15W, Sec 7 NW-NE-NW-NW	Unknown
21GD0250	Lithic scatter; precontact	T114N R15W, Sec 31, SE-SE-SW	Unknown
21GD0251	Artifact scatter; precontact	T113N R15W, Sec 6, NW-NW-NW	Unknown
Wisconsin			
47PI0185	6 conical mounds; Woodland affiliation	T25N R18W, Sec 19, NW	Unknown

Name of Historic Site	Location	Approximate Distance from the Plant	Comments
Bartron Archaeological Site	Undisclosed location on Prairie Island	0-1 miles	Prehistoric site
Metro Archeological District	Pierce County Wisconsin Restricted Address	1-2 miles	810 acres prehistoric site
Mendota to Wabasha Military Road	Cannon Bottom Road, Red Wing, MN	2-4 miles	48 acre military roadway
Alexander Anderson Estate	West of Red Wing on U.S. 61	2-4 miles	50 acres, brick, stone structure of architecture and engineering significance
Cross of Christ Lutheran Church	U.S. 61 Red Wing	4.5 miles	50 acres, architecture, engineering, religious significance.
Silvenale Site	Goodhue County Restricted Address	4-5 miles	No Information available

Table 4-2 National Register Sites within Five Miles of the PINGP Plant

	Daytime				Ambient Noise Sources
LOCATION	11-15-06		11-16-06		
	Morn.	Aftnoon	Morn.	Aftnoon	
#1. C. Suter Residence	34	34.6	31.9	32.3	Vents from plant
#2. 1754 Messiah Rd.	38.2	40.7	37.8	37.5	Local vehicle and train traffic
#3. Casino parking lot	42.5	46.1	43.8	43.3	Local vehicle and train traffic and casino vent fans on roof
#4. 1960 Edoka St.	39.9	41.7	40	39.9	Local vehicle and train traffic
#5. 1824 Edoka St.	35.3	35.7	32.2	33.5	Local vehicle and train traffic
#6. 5390 Sturgeon Lake Rd.	36.1	33.1	34.5	40.7	Local vehicle and train traffic

Table 4-3 Summary of Measured Ambient Noise Levels (L90) Around the PINGP

Table 4-4 Sources of Surface Water Discharge Streams from PINGP

Stream	Description
SD 001	Condenser/circulating water and Cooling Water
SD 002	Steam Generator blowdown
SD 003	Radioactive waste Effluent
SD 004	Reverse Osmosis Effluent (Monitoring and Reporting requirements only)
SD 005	U 1 Turbine Building sump
SD 006	U 2 Turbine Building sump
SD 010	Misc Plant Floor Drains
SD 012	Intake Screen wash (Monitoring and Reporting Requirements Only)
SW 001	Mississippi River Lock and Dam #3
SW 002	Plant Intake Channel (Monitoring and Reporting Requirements Only)
SW 003	Main River Channel Upstream Pt. (Monitoring and Reporting Requirements Only)
SW 004	Sturgeon Lake-upstream Pt. (Monitoring and Reporting Requirements Only)
WS 001 & SW 002	Combined U 1/U 2 Cooling water

Specific limits and monitoring requirements for each discharge are described in detail in the NPDES permit and are summarized in Xcel Energy's Certificate of Need application of May 16, 2008. Although the power uprate may require nominal increases in some discharges, none of the permit limits will require modification.

Year	Average Flow Rate Jan-Mar	Ice Thickness Fourth Week February	Thinnest Ice Measured	Thickest Ice Measured	Date Thickest Measured Ice	Outage Start	Outage End	Unit
1999	13,798	18	15	18	Feb W4	11/9/1998	1/1/1999	Unit 2
2000	13,669	10	7	14	Feb W2 & 3	None		
2001	9,153	21	19	26	Mar W5	1/19/2001	2/25/2001	Unit 1
2002	10,869	11	10	13	Mar W2	2/1/2002	3/2/2002	Unit 2
2003	10,178	25	12	25	Feb W4 & Mar W2	11/15/2002	12/6/2002	Unit 1
2004	9,452	21	19	21	Feb W4 & Mar W1	None		
2005	12,068	25	23	25	Feb W3 thru Mar W1	None		
2006	18,941	17	12	17	Feb W4	None		
2007	12,138	13	10	14	Mar W1	11/14/2006	12/15/2006	Unit 2
2008	8,405	26	23	28	Mar W2	2/13/2008	3/23/2008	Unit 1
Ten-year average	11,867	19	15	20				

Table 4-5 Ice thickness measurements for Lake Pepin (Survey Station 770) from 1999 through 2008 (obtained from the U.S. Army Corps of Engineers)

Table 4-6 Background Radiation Sources and Exposure[1]

Sources	Approximate Annual Dose (mrem/yr)	Percentage of Annual Dose
Natural Sources		
Radon in Indoor Air	200	55
Ingested Foods	39	11
Building Materials	28	8
Cosmic Rays (average)	28	8
Man-made Sources		
Medical Procedures	53	15
Consumer Products	11	3
Nuclear Fallout, Nuclear Fuel Cycle	< 2	< 1

mrem = millirem

[1]. National Council on Radiation Protection and Measurements. *Ionizing Radiation Exposure of the Population of the United States*. NCRP Report No. 93. Bethesda, MD: NCRP; 1987.

Table 4-7 Activity and Estimated Dose of Gaseous Effluents[1]

	Activity (Ci/yr)		Estimated Doses (mrem/yr)	
	Noble Gases	Particulate and Iodine	Whole Body	Organ
Average actual releases (2001 – 2005)	11.2	164 E-06	0.0026	0.073
Estimated value with 10% increase due to power uprate	12.3	179 E-06	0.0028	0.080

mrem = millirem, Ci/yr = curies per year

[1] Prairie Island Nuclear Generating Plant, Application for a Generating Plant Site Permit, August 2008, Section 4.3.

Table 4-8 Activity and Estimated Dose of Liquid Effluents[1]

	Activity (Ci/yr)		Estimated Doses (mrem/yr)	
	Non-Tritium[2]	Tritium	Whole Body	Organ
Average actual releases (2001 – 2005)	0.098	626	0.0026	0.0043
Estimated value with 10% increase due to power uprate	0.108	689	0.0028	0.0047

mrem = millirem, Ci/yr = curies per year

[1] Prairie Island Nuclear Generating Plant, Application for a Generating Plant Site Permit, August 2008, Section 4.3.

[2] Non-tritium elements present in liquid effluents include iron, silver, manganese, tin, cesium, sodium, chromium, cobalt, cerium, lanthanum, barium, niobium, strontium, tellurium, antimony, thallium, and zirconium.

Table 4-9 PINGP Volume and Activity of Solid Wastes[1]

	Volume (ft^3/yr)	Activity (Ci/yr)
Average actual releases (2001 – 2005)	15,597	343
Estimated value with 10% increase due to power uprate	15,597	377

Ci/yr = curies per year

[1] Prairie Island Nuclear Generating Plant, Certificates of Need Application, May 2008, Section 8.2.6.

Table 4-10 Summary of Estimated Doses and Cancer Incidences for the General Public and Plant Personnel with Extended Power Uprate[1]

General Public			
Exposure Pathway	**Estimated Whole Body Dose (mrem/yr)**	**Estimated Additional Risk of Cancer Incidence[2]**	**Estimated Additional Cancer Incidences[3]**
Gaseous Effluents	0.01	0.07 in 100,000	0.0003
Liquid Effluents	0.04[4]	0.28 in 100,000	0.0012
Solid Wastes	---[5]	---	---
Plant Personnel[6]			
Plant Operations and Maintenance	132	660 in 100,000	6.1

mrem = millirem

[1] See Chapter 1, Section 4.13 for a discussion of assumptions and calculations.
[2] For residents within 2 miles (approximately 450 persons) who receive the estimated dose annually for 70 years.
[3] Id.
[4] See Chapter 1, Section 4.13 for a discussion of liquid effluents. Estimated dose is based on exposure to tritium through groundwater / drinking water.
[5] Solid wastes are processed, packaged, and shipped off-site for permanent disposal in a federally licensed, low level radioactive waste disposal facility. Accordingly, assuming proper and long-term functioning of the disposal facility, exposure to the general public from these wastes is insignificant.
[6] Average plant personnel dose estimated from a collective dose of 122 person-rem/yr divided over 923 plant personnel. Exposure received for a working lifetime of 50 years. Actual personnel doses will vary with job functions and will be managed by the PINGP radiation protection program.

Table 4-11 Summary of Radiological Effluents from the Prairie Island Plant with Extended Power Uprate[1]

Effluents	Estimated Annual Radiological Release - Activity (curies /yr)
Gaseous Effluents	12.3
Liquid Effluents	689.1
Solid Wastes	377.0
TOTAL	1,078.4

[1] This table incorporates information from Chapter 1, Tables 4-7, 4-8, and 4-9.