Statement of Basis

Title V Air Quality Operating Permit Renewal

Northern States Power Company
d.b.a. Xcel Energy
Sioux Falls, South Dakota

South Dakota Department of Agriculture and Natural Resources

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1.0 Background

On December 8, 2016, the South Dakota Department of Agriculture and Natural Resources (DANR) renewed a Title V air quality operating permit to Northern States Power Company d.b.a. Xcel Energy (Xcel Energy) for its Angus Anson plant in Sioux Falls, South Dakota. Since the Title V air quality operating permit was renewed the following changes have been made:

- January 30, 2020 – Administrative Amendment to update the responsible official.

On May 6, 2021, DANR received a Title V air quality operating permit renewal application from Xcel Energy. The application was deemed complete on September 9, 2024.

On August 16, 2021, Xcel Energy submitted an administrative amendment application. For administrative ease, DANR will review this application at the same time as the renewal. Xcel Energy proposed to update report submittal requirements in several permit conditions. To avoid changing multiple permit conditions, DANR will modify the "Recordkeeping and reporting" permit condition in the renewed Title V air quality operating permit.

On March 23, 2026, Xcel Energy submitted an administrative amendment application to update the facility's contacts. For administrative ease, DANR will review this application at the same time as the renewal.

1.1 Existing Equipment

Table 1-1 provides a description of the currently permitted equipment, which was derived from the Title V air quality operating permit issued January 30, 2020.

Table 1-1 – Description of Permitted Units, Operations, and Processes

Unit	Description	Maximum Operating Rate	Control Equipment
#4	1993 Westinghouse gas turbine, Model #W501D5, fired with natural gas and distillate oil. A fogging device is installed to increase the megawatt output up to the maximum operating rate during warm weather months	1,480 (high heating value) million Btu per hour heat input	Water injection system to control nitrogen oxide emissions
#5	1993 Westinghouse gas turbine, Model #W501D5, fired with natural gas and distillate oil. A fogging device is installed to increase the megawatt output up to the maximum operating rate during warm weather months	1,480 (high heating value) million Btu per hour heat input	Water injection system to control nitrogen oxide emissions
#8	2004 General Electric simple cycle combustion turbine, Model 7FA, fired with natural gas and equipped with dry low NOx combustion technology. An evaporative cooler is installed to increase the megawatt	1,980 (high heating value) million Btu per hour input at 45° Fahrenheit; 160 megawatts, nominal	Not applicable

Unit	Description	Maximum Operating Rate	Control Equipment
	output up to the maximum operating rate during hot weather months		

1.2 Other Equipment

Xcel Energy's facility also has other emission activities. Table 1-2 provides a description of the other units at the facility.

Table 1-2 – Description of Other Units, Operations, and Processes

Description	Maximum Operating Rate	Control Device
Administrative/Turbine heating/cooling fired on natural gas	0.38 million Btu per hour	Not applicable
Administrative building heating/cooling fired on natural gas	3 units at 105,000 Btu per hour	Not applicable
AC building heating/cooling fired on propane	0.125 million Btu per hour	Not applicable
Warehouse heat fired on natural gas	2 units at 150,000 Btu per hour	Not applicable
Office heating unit fired on natural gas	56,000 Btu per hour	Not applicable
Sivalls heater	5.5 million Btu per hour	Not applicable
2015 Tank #1 containing diesel	896,994 gallons capacity	Not applicable

2.0 New Source Performance Standards

DANR reviewed the New Source Performance Standards listed in 40 CFR Part 60 and determined the following may be applicable to Xcel Energy.

2.1 Standards for Combustion Turbines – Subpart GG

In accordance with Administrative Rules of South Dakota 74:36:07:18, EPA originally promulgated standards of performance for stationary gas turbines, 40 CFR Part 60, Subpart GG, on September 10, 1979. The provisions of this subpart were applicable to all stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (10 million Btu) per hour, based on the lower heating value of the fuel fired, that commenced construction, modification, or reconstruction after October 3, 1977.

Turbines CT2 and CT3 (Units #4 and #5) were constructed in 1993 and have a maximum design capacity of 1,370 million Btu per hour heat input based on low heating value and 1,480 million Btu per hour heat input at high heating value. The low heating value equates to 1,444 gigajoules per hour (see Equation 2.1). Turbine CT4 (Unit #8) has a maximum design capacity of 1,800 million Btu per hour heat input based on low heating value and1,980 million Btu per hour heat input at high heating value. The low heating value equates to 1,898 gigajoules per hour (see

Equation 2.2). One gigajoule is equivalent to 1,000,000,000 joules. Equation 2.1 and 2.2 were used to convert million Btu per hour to gigajoules per hour.

Equation 2.1 – Converting to gigajoules per hour (Units #4 and #5)

$$Heat\ Input\left(\frac{GJ}{hour}\right) = \frac{1{,}370\left(\frac{MMBtu}{hour}\right) \times 10^6\left(\frac{Btu}{MMBtu}\right) \times 1{,}054.2\left(\frac{J}{Btu}\right)}{10^9\left(\frac{J}{GJ}\right)}$$

Heat input = 1,444 gigajoules per hour

Equation 2.2 – Converting to gigajoules per hour (Unit #8)

$$Heat\ Input\left(\frac{GJ}{hour}\right) = \frac{1{,}800\left(\frac{MMBtu}{hour}\right) \times 10^6\left(\frac{Btu}{MMBtu}\right) \times 1{,}054.2\left(\frac{J}{Btu}\right)}{10^9\left(\frac{J}{GJ}\right)}$$

Heat input = 1,898 gigajoules/hr

All three combustion turbines were constructed after October 3, 1977, and have a heat input rating greater than 10.7 gigajoules per hour. Therefore, all three combustion turbines fall under this subpart. Subpart GG has standards for nitrogen oxide and sulfur dioxide, and monitoring, record keeping, testing, and reporting requirements.

The nitrogen oxide limit for the three combustion turbines is based on Equation 2.3 and derived from 40 CFR § 60.332.

Equation 2.3 – Standard for Nitrogen Oxides

$$STD = 0.0075 \times \frac{14.4}{Y} + F$$

Where:

- STD = allowable ISO corrected nitrogen oxide emission concentration (percent by volume at 15 percent oxygen and on a dry basis);
- Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour; and
- F = Nitrogen oxide emission allowance for fuel bound nitrogen.

Xcel Energy did not request a nitrogen oxide emission allowance for fuel bound nitrogen so "F" is equal to 0. For Units #4 and #5, the manufacturer (Westinghouse) determined "Y" to equal 11.24 kilo joules per watt hour. Therefore, "STD" for Units #4 and #5 equates to 96 parts per million by volume at 15 percent oxygen and a dry basis. For Unit #8, the manufacturer (General Electric) determined "Y" to equal 9.88 kilo joules per watt hour. Therefore, "STD" for Unit #8 equates to 109 parts per million by volume at 15 percent oxygen and a dry basis.

Units #4 and #5 are required by a Prevention of Significant Deterioration requirement to meet a nitrogen oxide limit of 24 parts per million on a dry basis by volume while burning natural gas and 41 parts per million on a dry basis by volume while burning distillate oil at 15% oxygen on a 24-hour rolling basis. Compliance with the Prevention of Significant Deterioration nitrogen

oxide limit represents compliance with the nitrogen oxide limit in this subpart for Units #4 and #5. Compliance with the nitrogen oxide emission limit is based on 40 CFR § 60.8(c), "Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown and malfunction be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard." Subpart GG does not otherwise specify, therefore, excess emissions during startup, shutdown, or malfunction are not considered a violation of the emission limit.

In accordance with 40 CFR § 60.333(b), the fuel burned in the combustion turbines cannot contain sulfur in excess of 0.8 percent by weight. Under the Prevention of Significant Deterioration requirements that will be discussed later in this document, the sulfur content of the fuel burned in Units #4 and #5 cannot exceed 0.37 percent by weight which is more stringent. In the requirements of this subpart, Xcel Energy is required to submit a quarterly excess emission and monitor downtime report. Excess emissions for sulfur dioxide will be based on the sulfur in the fuel exceeding 0.37 percent by weight instead of 0.8 percent by weight. In addition, this subpart requires distillate oil sampling requirements for determining the sulfur content of the fuel. However, in a June 16, 2004, EPA Applicability Determination Index, EPA allows the use of fuel supplier certifications for determining compliance with the sulfur content of distillate oil. Therefore, both options will be specified in the draft permit.

2.2 Standard for Stationary Gas Turbines – Subpart KKKK

EPA promulgated standards of performance for new stationary gas turbines on July 6, 2006. Subpart KKKK contains emission standards and compliance schedules for the control of emissions from stationary combustion turbines. The provisions of this subpart are applicable to stationary combustion turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (10 million Btu) per hour that commenced construction, modification, or reconstruction after February 18, 2005.

The three combustion turbines were constructed prior to February 18, 2005; therefore, this subpart is not applicable.

2.3 Standards for Stationary Gas Turbines – Subpart TTTT

On October 23, 2015, EPA published a final New Source Performance Standard for new a fossil fuel fired electric generating unit under 40 CFR 60, Part TTTT. A new electric generating unit that is subject to this rule includes any steam electric generating unit, integrated gasification combined-cycle unit, or stationary combustion turbine that commenced construction after January 8, 2014 or commenced reconstructed after June 18, 2014, which has more than 250 million Btu per hour of heat input of fossil fuels alone or in combination with any other fuels, and which serves a generator capable of selling more than 25 megawatts of electricity to a utility power distribution system.

The three combustion turbines were constructed prior to January 8, 2014; therefore, this subpart is not applicable.

2.4 Standards for Electrical Generating Units – Subpart TTTTa

On May 9, 2024, EPA published a final New Source Performance Standard for modified fossil fuel fired electric generating units under 40 CFR 60, Part TTTTa. This subpart is applicable to coal-fired steam generating units or integrated gasification combined cycle facilities that commence modification after May 23, 2023. This subpart is also applicable to stationary combustion turbines that commence construction or reconstruction after May 23, 2023. An applicable stationary combustion turbine must also meet the following requirements: have more than 250 million Btu per hour of heat input of fossil fuels alone or in combination with any other fuels and serve a generator(s) capable of selling more than 25 megawatts of electricity to a utility power distribution system.

The three combustion turbines were constructed prior to January 8, 2014; therefore, this subpart is not applicable.

2.5 Standards Applicable to Storage Tanks – Subparts K, Ka, Kb, and Kc

There are four New Source Performance Standards for storage vessels. The four standards are applicable to the following storage vessels:

1. 40 CFR Part 60, Subpart K: applicable to storage vessels for petroleum liquids capable of storing greater than 40,000 gallons and commenced construction after June 11, 1973, but prior to May 19, 1978;
2. 40 CFR Part 60, Subpart Ka: applicable to storage vessels for petroleum liquids capable of storing greater than 40,000 gallons and commenced construction after May 18, 1978;
3. 40 CFR Part 60, Subpart Kb: applicable to storage vessels for volatile organic liquids capable of storing 75 cubic meters (approximately 19,813 gallons) or greater and commenced construction after July 23, 1984. This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa; and
4. 40 CFR Part 60, Subpart Kc: applicable to storage vessels for volatile organic liquids capable of storing greater than 20,000 gallons that commenced construction after October 4, 2023. This subpart does not apply to storage vessels with a maximum true vapor pressure less than 0.25 psia (1.7 kPa) or more than 204.9 kPa.

In accordance with 40 CFR § 60.110b(b), a storage vessel with a capacity greater than 151 cubic meters storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals is not applicable to Subpart Kb. Tank #1 was reconstructed in 2015 and has a capacity of 896,994 gallons which equates to a storage capacity of 3,395 cubic meters and stores distillate oil that has a maximum true vapor pressure of 0.02 kilopascals. Therefore, Subparts K, Ka, Kb, and Kc are not applicable to Tank #1.

2.6 Other New Source Performance Standards

DANR reviewed the other New Source Performance Standards and determined there are no other standards applicable to Xcel Energy at this time.

3.0 New Source Review

Administrative Rules of South Dakota (ARSD) 74:36:10:01 states New Source Review regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. Xcel Energy is located in Sioux Falls, South Dakota, which is in attainment or unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Xcel Energy is not subject to New Source Review.

4.0 Prevention of Significant Deterioration

A Prevention of Significant Deterioration review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated air pollutant. The following is a list of regulated air pollutants under the Prevention of Significant Deterioration program:

1. Total suspended particulate (PM);
2. Particulate with a diameter less than or equal to 10 microns (PM_{10});
3. Particulate with a diameter less than or equal to 2.5 microns ($PM_{2.5}$);
4. Sulfur dioxide (SO_2);
5. Nitrogen oxides (NOx);
6. Carbon monoxide (CO);
7. Ozone – measured as volatile organic compounds (VOCs);
8. Lead;
9. Fluorides;
10. Sulfuric acid mist;
11. Hydrogen sulfide;
12. Reduced sulfur compounds;
13. Total reduced sulfur; and
14. Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

4.1 Prevention of Significant Deterioration History

Xcel Energy is an existing major source under the Prevention of Significant Deterioration program. Units #4 and #5 have Best Available Control Technology (BACT) limits due to Xcel Energy's applicability to the Prevention of Significant Deterioration program. Xcel Energy took federally enforceable limits to avoid triggering Prevention of Significant Deterioration when permitting Unit #8. These limits will be discussed in the following sections.

4.1.1 Prevention of Significant Deterioration limits for Units #4 and #5

On May 7, 1992, EPA submitted a letter to Xcel Energy approving of Xcel Energy's Best Available Control Technology determination for each pollutant. The following is the control technology representing the Best Available Control Technology:

1. Particulates – Use of natural gas as the primary fuel and good combustion practices;
2. Sulfur dioxide – Use of natural gas as the primary fuel and a sulfur content of not more than 0.37 percent by weight when burning distillate oil;
3. Nitrogen oxide – Water injection system designed to control nitrogen oxide emissions;
4. Carbon monoxide – Good combustion practices;
5. Volatile organic compounds – Good combustion practices; and
6. Beryllium – Use of natural gas as the primary fuel.

Table 4-1 lists the emission limits representing the Best Available Control Technology.

Table 4-1 – Best Available Control Technology Emission Limits

Fuel	Criteria Pollutant	Best Available Control Technology Limits
Natural gas	PM_{10}	18 pounds per hour based on operating at the peak/base firing rate at negative 40 degrees Fahrenheit
		53 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
	Sulfur dioxide	87 pounds per hour based on operating at the peak/base firing rate at negative 40 degrees Fahrenheit
		311 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
		14 parts per million by volume on a dry basis based on operating at the peak firing rate at 100 degrees Fahrenheit
	Nitrogen oxide	128 pounds per hour based on operating at the peak firing rate at 59 degrees Fahrenheit
		521 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
		24 parts per million by volume on a dry basis corrected to 15% oxygen based on operating at 59 degrees Fahrenheit
	Volatile organic compounds	11 pounds per hour based on operating at the peak/base firing rate at negative 40 degrees Fahrenheit
		38 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
		150 parts per million by volume based on operating at 35% of capacity
	Carbon monoxide	158 pounds per hour based on operating at the peak/base firing rate at negative 40 degrees Fahrenheit
		556 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit

Fuel	Criteria Pollutant	Best Available Control Technology Limits
		400 parts per million by volume based on operating at 35% of capacity
Distillate oil	PM_{10}	112 pounds per hour based on operating at the peak firing rate at negative 40 degrees Fahrenheit
		394 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
	Sulfur dioxide	554 pounds per hour based on operating at the peak/base firing rate at negative 40 degrees Fahrenheit
		1,840 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
		82 parts per million by volume on a dry basis based on operating at the peak firing rate at 100 degrees Fahrenheit
	Nitrogen oxide	232 pounds per hour based on operating at the peak firing rate at 59 degrees Fahrenheit
		863 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
		41 parts per million by volume on a dry basis corrected to 15% oxygen based on operating at 59 degrees Fahrenheit
	Volatile organic compounds	65 pounds per hour based on operating at the peak/base firing rate at negative 40 degrees Fahrenheit
		228 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
		100 parts per million by volume based on operating at 35% of capacity
	Carbon monoxide	160 pounds per hour based on operating at the peak/base firing rate at negative 40 degrees Fahrenheit
		569 tons per year based on operating at the base firing rate at 59 degrees Fahrenheit
		220 parts per million by volume based on operating at 35% of capacity

Xcel Energy was originally issued a federal Prevention of Significant Deterioration preconstruction permit in 1992. In 2000, DANR issued the current Prevention of Significant Deterioration permit for Units #4 and #5. No changes to the Prevention of Significant Deterioration preconstruction permit have been requested by Xcel Energy. Below is Units #4's and #5's short term and long term limits as permitted in the Prevention of Significant Deterioration preconstruction permits and Title V operating permits issued by DANR. These limits are on a per Unit basis. DANR proposes to update the language in the Title V operating permit to make this clearer.

Table 4-2 – Air Emission Limits During Base Operations for Units #4 and #5 (Greater than or equal to 90 percent of design output)

Air Pollutant	Natural Gas[1]		Distillate Oil[1]	
	pounds/hour	tons/year	pounds/hour	tons/year
PM_{10}	18	52.6	112	394.2
Sulfur Dioxide	87	311	554	1,839.6
Nitrogen Oxide[5]	128	521.2	232	862.9
Volatile Organic Compounds	11	38.1	65	227.8
Carbon Monoxide	158	556.3	160	569.4

[1] - Compliance with the PM10, volatile organic compound, and carbon monoxide limits will be based on stack performance tests.

Table 4-3 – Air Emission Limits During All Operations for Units #4 and #5 (Except during startup, shutdown, and malfunctions)

Air Pollutant	Natural Gas[1]	Distillate Oil[1]
	ppmvd[3]	ppmvd[3]
Sulfur Dioxide	14	82
Nitrogen Oxide[2, 4, 5]	24	41
Volatile Organic Compounds	150	100
Carbon Monoxide	400	220

[1] - Compliance with the volatile organic compound and carbon monoxide limits will be based on stack performance tests;

[2] - The nitrogen oxide limit shall be corrected and based on 15 percent oxygen;

[3] – "ppmvd" means parts per million by volume on a dry basis;

[4] - The nitrogen oxide limit is based on a 24-hour rolling average during normal operating conditions. A 24-hour rolling average is calculated for each normal operating hour by averaging nitrogen oxide data from the past 24 operating hours taking into consideration fuels burned. Startups, shutdowns, malfunctions, and periods in which the turbine is not operating shall be excluded from determining the 24-hour rolling average; and

[5] – The owner or operator is exempt from the nitrogen oxide limit during ice fog and water restrictions as identified in permit condition 12.2.

The Prevention of Significant Deterioration preconstruction permit required the owner or operator to operate Units #4 and #5 with the water injection system engaged at all times except during startup, shutdown, and malfunctions. Startup is defined as the time period for safe power ascent beginning when the unit starts producing electricity and ends when the unit reaches 30 megawatts when fueling with natural gas and 12 megawatts when fueling with distillate oil. Shutdown is defined as the time period for safe power descent beginning when the unit reaches 30 megawatts when fueling with natural gas and 12 megawatts when fueling with distillate oil and ends when the unit is not producing electricity. The owner or operator is not allowed to idle Units #4 or #5 at electric production rates where the water injection system cannot be engaged. Malfunctions that occur on a regular basis or could have been avoided by preventive maintenance or could have been mitigated by a timely response by the owner or operator are considered violations.

4.1.2 Unit #8 Limits

In July 2004, Xcel Energy submitted an application to install a new simple cycle combustion turbine (Unit #8). In that application, Xcel Energy requested federally enforceable limits be included in the permit to allow Xcel Energy to forgo a major modification of its Prevention of Significant Deterioration preconstruction permit. To forgo a major modification of its Prevention of Significant Deterioration preconstruction permit, Xcel Energy must maintain its emissions from the new simple cycle combustion turbine below the significant thresholds listed below for the specific air pollutant:

1. Carbon Monoxide (CO) -- 100 tons per year
2. Nitrogen Oxides (NOx) -- 40 tons per year
3. Sulfur Dioxide (SO_2) -- 40 tons per year
4. Particulate Matter (PM) -- 25 tons per year
5. Particulate Matter less than 10 Microns (PM_{10}) -- 15 tons per year
6. Volatile Organic Compounds -- 40 tons per year
7. Lead -- 0.6 tons per year
8. Asbestos -- 0.007 tons per year
9. Beryllium - 0.0004 tons per year
10. Mercury - 0.1 tons per year
11. Vinyl Chloride -- 1 ton per year
12. Fluorides -- 3 tons per year
13. Sulfuric Acid Mist -- 7 tons per year
14. Hydrogen Sulfide -- 10 tons per year
15. Total Reduced Sulfur Compounds -- 10 tons per year
16. Reduced Sulfur Compounds -- 10 tons per year

At the time of permitting Unit #8, particulate matter less than 2.5 microns was not a criteria air pollutant; therefore, Unit #8 is not required to be maintained below the major modification threshold for particulate matter less than 2.5 microns. EPA's emission factors for stationary gas turbines burning natural gas (AP42; 3.1; 4/00), do not list a factor for lead, asbestos, beryllium, mercury, vinyl chloride, fluorides, sulfuric acid mist, hydrogen sulfide, total reduced sulfur compounds or reduced sulfur compounds. Therefore, these compounds are considered insignificant.

Previous reviews of the potential emissions for the Unit #8 combustion turbine indicated that total suspended particulate, particulate matter less than 10 microns, nitrogen oxide, and carbon monoxide emissions exceed the Prevention of Significant Deterioration significant threshold and would be considered a major modification. To establish emission limits to forgo a major modification of its Prevention of Significant Deterioration preconstruction permit, DANR established short term (pounds per hour) and long term (hours per year) limits to maintain emissions less than the significant threshold.

In the 2004 air quality permit, a short term and long term limit was established for total suspended particulate and particulate matter less than 10 microns to ensure emissions are below the significant threshold. DANR established a short term limit of 9.0 pounds per hour for

particulate matter less than 10 microns. A long term limit of 3,160 hours per 12-month period to maintain Xcel Energy's particulate emissions less than 23.8 and 14.3 tons per year for both total suspended particulate and particulate matter less than 10 microns emissions, respectively.

Table 4-4 lists the operational limits for Unit #8 in the Title V air quality operating permit issued July 13, 2004 to stay below the Prevention of Significant Deterioration major modification thresholds. The particulate matter short term limit was erroneously removed in the 2010 Title V air quality operating permit renewal. This short term limit will be placed back in the Title V air quality operating permit and the long term limits will be continued in this permit renewal. The facility did not exceed the limit since the 2010 renewal and since this limit was previously established, placing it back in the Title V operating permit is not considered a modification.

Table 4-4 – Emission Limits for Unit #8

Air Pollutant	Short Term Emission Limit[1]	Long Term Limit[2]
Particulate matter[3]	9.0 pounds per hour	3,160 hours per 12-month rolling period
Nitrogen oxide[4]	Not applicable	38 tons per 12-month rolling period
Carbon monoxide[4]	Not applicable	95 tons per 12-month rolling period

[1] – Compliance with the short term emission limit shall be based on a performance test.
[2] – Compliance with the long term limit shall be based on a 12-month rolling period. Each monthly emission rate shall be added to the 11 previous monthly emission rates. The result shall be compared to the long term emission limit.
[3] – The 12-month rolling period shall be based on the number of hours operated.
[4] – The 12-month rolling period shall be based on the continuous emission monitoring data.

4.2 Potential Emissions

DANR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, DANR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.

Potential emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application and assuming the unit operates every hour of every day of the year, while using the fuel that will emit the greatest emissions. Potential emissions are not realistic of the actual emissions and are used only to identify which air quality permit and requirements are applicable.

4.2.1 Potential Emissions – Combustion Turbines

Xcel Energy operates three combustion turbines. Units #4 and #5 generate emissions through the combustion of distillate oil or natural gas. Units #4 and #5 have federally enforceable short and long term limits as can be seen in Tables 4-2 and 4-3. The potential to emit for Units #4 and #5 will be assumed to be these long term limits. For total suspended particulate matter and particulate matter less than 2.5 microns are assumed to be equivalent to particulate matter less than 10 microns.

Unit #8 produces emissions through the combustion of natural gas. Unit #8 has long term limits on nitrogen oxide and carbon monoxide and a long term and short term limit for particulate matter less than 10 microns. These limits can be seen in Table 4-4. The potential to emit for nitrogen oxide and carbon monoxide are assumed to be equivalent to the federally enforceable long term limits. For total suspended particulate matter and particulate matter less than 2.5 microns are assumed to be equivalent to particulate matter less than 10 microns. To calculate the particulate matter potential emissions, Equation 4.1 is used with the short term hourly emission limit and the long term hour limit. The results are seen in Table 4-6.

Equation 4.1 – Potential Emissions based on Hourly Limit

$$Potential\ Emissions\left(\frac{tons}{year}\right) = \frac{Hourly\ Limit\left(\frac{pounds}{hour}\right) \times 3{,}160\ Hours}{2{,}000\left(\frac{pounds}{ton}\right)}$$

For sulfur dioxide and volatile organic compound emissions, the emission factors for natural gas combustion were derived from AP-42, 3.1, Table 3.1-2a, April 2000. Table 4-5 provides the uncontrolled emission factors for natural gas combustion.

Table 4-5 –Emission Factors for Natural Gas Combustion Turbine

	SO_2	VOC
Pounds per million Btu	0.94S[1]	0.0021

[1] –Where S equals the sulfur content of natural gas. AP-42 states to use 0.0034 pounds per million Btu if the sulfur content is not given. The application did not state a sulfur content; therefore, 0.0034 pounds per million Btu was used.

Potential sulfur dioxide and volatile organic compound emissions for Unit #8 are calculated using Equation 4.2, the emission factors from Table 4-5, the hourly limit in Table 4-3, and the heat input of the turbine found in Table 1-1. The results are shown in Table 4-6.

Equation 4.2 – Potential Emissions using AP-42

$$Potential\ Emissions\left(\frac{tons}{year}\right) = \frac{Heat\ Input\left(\frac{MMBtu}{hour}\right) \times Emission\ Factor\left(\frac{pounds}{MMBtu}\right) \times 3{,}160\ Hours}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-6 –Potential Emissions from Turbines (tons per year)

Unit	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
#4 (Diesel)	394.2	394.2	394.2	1,839.6	862.9	569.4	227.8
#4 (Natural Gas)	52.6	52.6	52.6	311	521.2	556.3	38.1
#5 (Diesel)	394.2	394.2	394.2	1,839.6	862.9	569.4	227.8
#5 (Natural Gas)	52.6	52.6	52.6	311	521.2	556.3	38.1
#8	14.2	14.2	14.2	10.6	38	95	6.6

4.2.2 Potential Emissions – Storage Tank

The storage tank's potential emissions were estimated using the Tanks 4.09D program and were provided in the application. DANR agrees with the calculations. The potential emissions are summarized in Table 4-9.

4.2.3 Potential Emissions – Other Fuel Burning Units

Xcel Energy operates other equipment that is fired with natural gas. The AC building heating/cooling unit is fired with propane. The emission factors for the equipment fired by natural gas were derived for boilers with less than 100 million Btu heat input from AP-42, Chapter 1.4, Tables 1.4-1 and 1.4-2 (7/98). The emission factors for the equipment being fired on propane were derived from AP-42, Chapter 1.5, Table 1.5-1 (07/08) under industrial boilers. The emission factors are summarized in Table 4-7.

Table 4-7 –Emission Factors for Other Fuel Burning Units

	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
Natural Gas (lb/MMscf)[1]	7.6	7.6	7.6	0.6	100	84	5.5
Natural Gas (lb/MMBtu)	0.0075	0.0075	0.0075	0.0006	0.098	0.082	0.0054
Propane (lb/10^3 gallons)[3]	0.7	0.7	0.7	0.10S[2]	13	7.5	0.8
Propane (lb/MMBtu)	0.0077	0.0077	0.0077	0.0002	0.14	0.082	0.009

[1] – To convert from pounds per million cubic feet to pounds per million Btu, divide by 1,020;
[2] – S is the sulfur content of the propane in grains per 100 cubic feet of gas. The sulfur content of the propane assumed to be 0.2 grains per 100 cubic feet; and
[3] – To convert from pounds per 1000 gallons (lb/10^3 gal) to pounds per million Btu (lb/MMBtu), divide by 91.5;

Potential emissions for equipment are calculated using Equation 4.3, the emission factors from Table 4-7, and the heat input of the equipment found in Table 1-2. The results are shown in Table 4-8.

Equation 4.3 – Potential Emissions

$$Potential\ Emissions\left(\frac{tons}{year}\right) = \frac{Heat\ Input\left(\frac{MMBtu}{hour}\right) \times Emission\ Factor\left(\frac{pound}{MMBtu}\right) \times 8{,}760\left(\frac{hours}{year}\right)}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-8 –Potential Emissions from Other Equipment (tons per year)

Unit	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
Administrative/Turbine heating/cooling	0.012	0.012	0.012	0.001	0.163	0.137	0.009
Administrative building heating/cooling	0.010	0.010	0.010	0.001	0.135	0.114	0.007
AC building heating/cooling	0.004	0.004	0.004	0.000	0.078	0.045	0.005
Warehouse heat	0.010	0.010	0.010	0.001	0.129	0.108	0.007
Office heating unit	0.002	0.002	0.002	0.000	0.024	0.020	0.001

Unit	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
Sivalls heater	0.179	0.179	0.179	0.014	2.362	1.984	0.130
Total:	**0.217**	**0.217**	**0.217**	**0.017**	**2.891**	**2.408**	**0.159**

4.2.4 Summary of Facility's Potential Emissions

Table 4-9 summarizes the facility's uncontrolled potential emissions.

Table 4-9 – Facility-Wide Potential Emissions (tons per year)

Unit	TSP	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	VOC
#4[1]	394.2	394.2	394.2	1,839.6	862.9	569.4	227.8
#5[1]	394.2	394.2	394.2	1,839.6	862.9	569.4	227.8
#8	14.2	14.2	14.2	10.6	38	95	6.6
Storage Tank	-	-	-	-	-	-	0.36
Other Equipment	0.217	0.217	0.217	0.017	2.891	2.408	0.159
Facility Total	**803**	**803**	**803**	**3,690**	**1,767**	**1,236**	**463**

[1] – Emissions from Units #4 and #5 are from worst case scenario fuel for each pollutant.

4.3 Prevention of Significant Deterioration Summary

Xcel Energy is considered an existing Prevention of Significant Deterioration source. Units #4 and #5 are existing units under the Prevention of Significant Deterioration program. With Unit #8's limits, its potential to emit is less than the major modification thresholds and is not applicable to the Prevention of Significant Deterioration program. Since Xcel Energy is a major source under the Prevention of Significant Deterioration program, any future changes will have to be reviewed to determine if they would be considered a major modification under the Prevention of Significant Deterioration program.

5.0 National Emission Standards for Hazardous Air Pollutants

DANR reviewed the National Emission Standards for Hazardous Air Pollutants in 40 CFR Part 61 and determined there are no standards applicable to Xcel Energy.

6.0 Maximum Achievable Control Technology Standards

The federal Maximum Achievable Control Technology Standards are applicable to both major and area sources of hazardous air pollutants. A major source of hazardous air pollutants is defined as having the potential to emit 10 tons or more per year of a single hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. An area source is a source that is not a major source of hazardous air pollutants.

6.1 Potential Hazardous Air Pollutant Emissions

DANR uses stack test results to determine air emissions whenever stack test data is available

from the source or a similar source. When stack test results are not available, DANR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.

6.1.1 Potential Hazardous Air Pollutant Emissions – Combustion Turbines

Xcel Energy operates two natural gas and diesel fired combustion turbines and one combustion turbine fired solely on natural gas. The hazardous air pollutant emission factors for natural gas combustion are derived from AP-42, 3.1, Tables 3.1-2a and 3.1-3, April 2000, and are displayed in Table 6-1. The hazardous air pollutant emission factors for diesel combustion are derived from AP-42, 3.1, Tables 3.1-4 and 3.1-5, April 2000, and are displayed in Table 6-2.

Table 6-1 – Emission Factors for Natural Gas Combustion from Turbines (lb/MMBtu)

Compound	Emission Factor
1, 3 – Butadiene	4.3 E-07
Acetaldehyde	4.0 E-05
Acrolein	6.4 E-06
Benzene	1.2 E-05
Ethylbenzene	3.2 E-05
Formaldehyde	7.1 E-04
Napthalene	1.3 E-06
PAH	2.2 E-06
Propylene Oxide	2.9 E-05
Toluene	1.3 E-04
Xylenes	6.4 E-05
Total Hazardous Air Pollutants	**1.027 E-03**

Table 6-2 – Emission Factors for Diesel Combustion from Turbines (lb/MMBtu)

Compound	Emission Factor
Lead	1.4 E-05
1, 3 – Butadiene	1.6 E-05
Benzene	5.5 E-05
Formaldehyde	2.8 E-04
Naphthalene	3.5 E-05
PAH	4.0 E-05
Arsenic	1.1 E-05
Beryllium	3.1 E-07
Cadmium	4.8 E-06
Chromium	1.1 E-05
Manganese	7.9 E-04
Mercury	1.2 E-06
Nickel	4.6 E-06
Selenium	2.5 E-05
Total Hazardous Air Pollutants	**1.288 E-03**

Xcel Energy has previously accepted federally enforceable limits to avoid being a major source of hazardous air pollutants due the potential to emit for formaldehyde being above the single hazardous air pollutant threshold. Xcel Energy is required to limit hours of operation for Units #4 and #5 to 6,934 hours each per 12-month rolling period. DANR does not propose to change this limit; therefore, the potential emissions for Units #4 and #5 will be found using this limit.

Potential hazardous air pollutant emissions from Units #4 and #5 are calculated using Equation 6.1, the hazardous air pollutant emission factors from Tables 6-1 and 6-2, and heat input of the turbines. Potential hazardous air pollutant emissions from Unit #8 are calculated using Equation 4.2, the hazardous air pollutant emission factors from Table 6-1, and heat input of the turbine. The results are shown in Table 6-3.

Equation 6.1 – Limited Potential Emissions for Units #4 and #5

$$Potential\ Emissions\left(\frac{tons}{year}\right) = \frac{Heat\ Input\left(\frac{MMBtu}{hour}\right) \times Emission\ Factor\left(\frac{pounds}{MMBtu}\right) \times 6{,}934\ Hours}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 6-3 – Potential Hazardous Air Pollutant Emissions from Turbines (tons per year)

Unit	Hazardous Air Pollutants	Formaldehyde
#4 (Diesel)	6.61	1.44
#4 (Natural Gas)	5.30	3.64
#5 (Diesel)	6.61	1.44
#5 (Natural Gas)	5.30	3.64
#8	3.22	2.22

6.1.2 Potential Hazardous Air Pollutant Emissions – Storage Tank

The storage tank's potential hazardous air pollutant emissions were estimated using the Tanks 4.09D program and are summarized in Table 6-6.

6.1.3 Potential Hazardous Air Pollutant Emissions – Other Fuel Burning Units

Xcel Energy operates other equipment that is fired with natural gas. The AC building heating/cooling unit is fired with propane. The emission factors for the equipment fired by natural gas were derived for boilers with less than 100 million Btu heat input from AP-42, Chapter 1.4, Table 1.4-3 (7/98). AP-42 does not give a hazardous air pollutant emission factor for propane. Therefore, only natural gas will be considered in calculating the potential hazardous air pollutants. The hazardous air pollutant emission factors for the boiler are summarized in Table 6-4.

Table 6-4 – Hazardous Air Pollutant Emission Factor for Natural Gas Combustion

Pollutant	HAP	Formaldehyde
Pounds per million standard cubic feet	1.888	0.075
Pounds per million Btu[1]	0.0019	0.00007

[1] – To convert from lb/MMscf to lb/MMBtu, divide by 1,020.

Potential emissions for the equipment are calculated using Equation 4.3, the emission factors from Table 6-4, and the heat input of the equipment found in Table 1-2. The results are shown in Table 6-5.

Table 6-5 –Potential Emissions from Other Equipment (tons per year)

Unit	Hazardous Air Pollutants	Formaldehyde
Administrative/Turbine heating/cooling	0.0031	0.00012
Administrative building heating/cooling	0.0026	0.00010
AC building heating/cooling	0.0010	0.00004
Warehouse heat	0.0024	0.00010
Office heating unit	0.0005	0.00002
Sivalls heater	0.0446	0.00177
Total:	**0.0542**	**0.00215**

6.1.4 Hazardous Air Pollutant Emissions Summary

Table 6-6 summarizes the facility-wide potential hazardous air pollutant emissions.

Table 6-6 – Facility Potential Emissions (tons per year)

Unit	Hazardous Air Pollutants	Formaldehyde
#4[1]	6.61	3.64
#5[1]	6.61	3.64
#8	3.22	2.22
Storage Tank	0.00	0.00
Other Equipment	0.05	0.002
Facility Total	**16.49**	**9.5**

[1] – Emissions from Units #4 and #5 are from worst case scenario fuel for each pollutant.

Based on Table 6-6, the limited potential to emit is less than 10 tons per year of a single hazardous air pollutant, and less than 25 tons per year of any combination of hazardous air pollutants. Therefore, Xcel Energy is considered an area source for hazardous air pollutants.

6.2 Maximum Achievable Control Technology Standards

DANR reviewed the Maximum Achievable Control Technology standards under 40 CFR Part 63 and determined the following may be applicable to Xcel Energy.

6.2.1 Standards for Stationary Combustion Turbine – Subpart YYYY

The provisions of this subpart are applicable to owners or operators of a stationary combustion turbine located at a major source of hazardous air pollutant emissions. A stationary combustion turbine means all equipment, including but not limited to the turbine, the fuel, air, lubrication and exhaust gas systems, control systems (except emissions control equipment), and any ancillary components and sub-components comprising any simple cycle stationary combustion turbine, any regenerative/recuperative cycle stationary combustion turbine, the combustion turbine portion of any stationary cogeneration cycle combustion system, or the combustion turbine

portion or any stationary combined cycle steam/electric generating system. Stationary combustion turbines covered by this subpart include simple cycle stationary combustion turbines, regenerative/recuperative cycle stationary combustion turbines, cogeneration cycle stationary combustion turbines, and combined cycle stationary combustion turbines.

Xcel Energy is an area source of hazardous air pollutants; therefore, the facility is not subject to Subpart YYYY.

6.2.2 Other Maximum Achievable Control Technology Standards

DANR reviewed the Maximum Achievable Control Technology standards and determined there are no other standards applicable to Xcel Energy at this time.

7.0 Acid Rain Program

Xcel Energy's combustion turbines are subject to the Acid Rain Program. Xcel Energy shall operate each applicable unit in accordance with the standard requirements set forth in the phase II acid rain permit application submitted May 6, 2021.

8.0 State Requirements

8.1 Permit Type

According to Administrative Rules of South Dakota 74:36:05:03, a facility is required to obtain a Title V air quality operating permit if the source has the potential to emit more than 100 tons per year of a criteria pollutant (nitrogen oxide, volatile organic compounds, particulate matter, carbon monoxide, lead, and ozone), has the potential to emit more than 10 tons per year of a single hazardous air pollutant, has the potential to emit more than 25 tons per year of any combination of hazardous air pollutants, or is applicable to a New Source Performance Standard or a Maximum Achievable Control Technology standard. Based on the potential emissions in Table 4-9, Xcel Energy is considered a major source of emissions under the Title V air quality permitting program and is required to obtain a Title V air quality operating permit.

8.2 Insignificant Activities

In accordance with Administrative Rules of South Dakota 74:36:05:04.01, the following emission units are exempt from inclusion in the Title V air quality permit unless the source has requested federally enforceable permit conditions related to the emission unit to avoid needing a Prevention of Significant Deterioration preconstruction permit, or New Source Review preconstruction permit or the emission unit is applicable to a New Source Performance Standard or a Maximum Achievable Control Technology Standard:

1. One or more incinerators of less than 100 pounds per hour combined burning capacity that combust municipal or household waste;

2. A mobile internal combustion engine, including those in autos, trucks, tractors, airplanes, locomotives, and boats;
3. Laboratory equipment used exclusively for chemical or physical analysis;
4. A unit that has a heat input capability of not more than 3,500,000 Btu per hour, except for units fueled with wood or coal;
5. An air conditioning or ventilating system not designed to remove air pollutants from equipment;
6. Routine housekeeping or plant upkeep activities such as painting buildings, re-tarring roofs, or paving parking lots;
7. A unit that has the potential to emit two tons or less per year of any criteria pollutant before the application of control equipment. However, the criteria pollutant emissions from the unit must be included in determining whether the source is a minor source; and
8. A unit that has the potential to emit two tons or less per year of any hazardous air pollutant. However, the hazardous air pollutant emissions from the unit must be included in determining whether the source is a major source.

An emission unit that is exempt from permitting must still meet the visible emission restriction in Administrative Rules of South Dakota 74:36:12:01. Since the applicability thresholds are based on tons per year, the department views the emissions from the potential insignificant activities as rounded to the nearest whole number. Table 8-1 summarizes the units that are exempt from permitting.

Table 8-1 – Insignificant Activities

Unit	Exemption #
Administrative/Turbine heating/cooling	7, 8
Administrative building heating/cooling	7, 8
AC building heating/cooling	7, 8
Warehouse heat	7, 8
Office heating unit	7, 8
Sivalls heater	7, 8
Tank #1	7, 8

8.3 State Emission Limits

South Dakota has air emission limits for particulate matter and sulfur dioxide. The emission limits apply to industry units and fuel burning units. Units classified as insignificant activities are not applicable to the state emission limits. In accordance with Administrative Rules of South Dakota 74:36:06:01, a unit that must comply with a total suspended particulate matter emission limit under the New Source Performance Standards, Maximum Achievable Control Technology Standards, the Acid Rain Program, or the Prevention of Significant Deterioration Program is exempt from having to meet the state's total suspended particulate matter and sulfur dioxide emission limits. Units #4, #5, and #8 are applicable to New Source Performance Standard Subpart GG and the Acid Rain Program that have sulfur dioxide limits and are exempt from the state's sulfur dioxide emission limits.

8.3.1 State Particulate Matter Emission Limits

In accordance with Administrative Rules of South Dakota 74:36:06:02(1)(b), a fuel burning unit with a heat input equal to or greater than 10 million Btu per hour heat input may not exceed the particulate emissions rate determined by Equation 8.1. Equation 8.1 and maximum operating rate are used to calculate the state particulate emission limit. The potential emission rates were found by taking the short term emission limits for each unit for its fuel type and dividing by the maximum heat capacity of the units found in Table 1-1. The comparison is summarized in Table 8-2.

Equation 8.1 – Particulate Emissions Limit for Fuel Burning Units

$E_{TSP} = 0.811 \times H^{-0.131}$

Where:

- E_{TSP} = emission rate, in pounds per million Btu heat input, and
- H = heat input, in million Btu per hour.

Table 8-2 – Particulate Matter Limit Comparison

Unit	Natural Gas Potential Emission Rate	Diesel Potential Emission Rate	State Emission Limit
#4	0.01 pounds per million Btu	0.08 pounds per million Btu	0.3 pounds per million Btu heat input
#5	0.01 pounds per million Btu	0.08 pounds per million Btu	0.3 pounds per million Btu heat input
#8	0.005 pounds per million Btu	-	0.3 pounds per million Btu heat input

Based on the comparison in Table 8-2, Xcel Energy is capable of operating the facility in compliance with the state particulate matter emission limits.

8.3.2 Visible Emission Limits

Visible emissions are applicable to units that discharge into the ambient air. In accordance with Administrative Rules of South Dakota 74:36:12, a facility may not discharge into the ambient air more than 20 percent opacity for all units. Xcel Energy must control the opacity at less than 20 percent for all units.

8.4 Performance Tests

Xcel Energy is required to meet various short term emissions limits to ensure compliance with long term limits. Compliance with the short term limits is demonstrated through performance testing, fuel content limits, or the use of continuous emission monitoring systems. Table 8-3 displays a comparison between the short term emission limits and stack test results if applicable.

Table 8-3 – Short Term Emission Limit Comparisons

Unit	Air Pollutant	Date	Results	Limit	In Compliance
#4 (natural gas)	PM	-	[1]	18 lb/hr	[1]
	SO_2	-	N/A	87 lb/hr	Fuel limited to 0.37 weight%
	SO_2	-	N/A	14 ppm	Fuel limited to 0.37 weight%
	NOx	-	N/A	128 lb/hr	Demonstrated using CEMS
	NOx	-	N/A	24 ppm	Demonstrated using CEMS
	CO	03/15/05	11.1 lb/hr	158 lb/hr	Yes
	CO	03/15/05	4.1 ppm	400 ppm	Yes
	VOC	03/15/05	0.4 lb/hr	11 lb/hr	Yes
	VOC	03/15/05	0.1 ppm	150 ppm	Yes
#5 (natural gas)	PM	11/30/04	7.9 lb/hr	18 lb/hr	Yes
	SO_2	-	N/A	87 lb/hr	Fuel limited to 0.37 weight%
	SO_2	-	N/A	14 ppm	Fuel limited to 0.37 weight%
	NOx	-	N/A	128 lb/hr	Demonstrated using CEMS
	NOx	-	N/A	24 ppm	Demonstrated using CEMS
	CO	-	[1]	158 lb/hr	[1]
	CO	-	[1]	400 ppm	[1]
	VOC	-	[1]	11 lb/hr	[1]
	VOC	-	[1]	150 ppm	[1]
#4 (diesel)	PM	-	[1]	112 lb/hr	[1]
	SO_2	-	N/A	554 lb/hr	Fuel limited to 0.37 weight%
	SO_2	-	N/A	82 ppm	Fuel limited to 0.37 weight%
	NOx	-	N/A	232 lb/hr	Demonstrated using CEMS
	NOx	-	N/A	41 ppm	Demonstrated using CEMS
	CO	-	[1]	158 lb/hr	[1]
	CO	-	[1]	220 ppm	[1]
	VOC	-	[1]	65 lb/hr	[1]
	VOC	-	[1]	100 ppm	[1]
#5 (diesel)	PM	11/30/04	20.8 lb/hr	112 lb/hr	Yes
	SO_2	-	N/A	554 lb/hr	Fuel limited to 0.37 weight%

Unit	Air Pollutant	Date	Results	Limit	In Compliance
	SO_2	-	N/A	82 ppm	Fuel limited to 0.37 weight%
	NOx	-	N/A	232 lb/hr	Demonstrated using CEMS
	NOx	-	N/A	41 ppm	Demonstrated using CEMS
	CO	12/02/04	0.6 lb/hr	158 lb/hr	Yes
	CO	12/02/04	0.3 ppm	220 ppm	Yes
	VOC	12/02/04	0.2 lb/hr	65 lb/hr	Yes
	VOC	12/02/04	0.1 ppm	100 ppm	Yes
#8	PM	05/10/05	7.01 lb/hr	9.0 lb/hr	Yes

[1] – Units #4 and #5 are considered representative of each other for testing purposes

Xcel Energy typically operates Units #4 and #5 while burning solely natural gas. Table 8-4 displays the amount of hours that Units #4 and #5 have operated while burning diesel fuel since 2017.

Table 8-4 – Diesel Operating Hours

Year	Unit #4	Unit #5
2024	13.08	7.25
2023	1.32	0.5
2022	7.45	8.03
2021	61	46.62
2020	7.8	4.35
2019	45.22	7.48
2018	2.65	11.78
2017	1.53	1.45
Average:	**17.5**	**10.9**

Since Units #4 and #5 rarely operate while combusting diesel, DANR is not recommending performance testing unless one of the units operate while on diesel for more than 250 hours in a calendar year. DANR is not recommending testing for sulfur dioxide due to the fuel weight percentage limit that is currently in the Title V operating permit. DANR is also not recommending testing for nitrogen oxides due to the facility's use of continuous emission monitoring systems that have Relative Accuracy Test Audits performed annually.

Based on the information above and in Tables 8-3 and 8-4, DANR is recommending the following performance testing:

- Particulate matter testing for Unit #4 which will be representative for Unit #5 while operating on natural gas;
- Carbon monoxide and volatile organic compound testing on Unit #5 which will be representative for Unit #4 while operating on natural gas;

- Particulate matter, carbon monoxide, and volatile organic compounds testing for Unit #4 or #5 while operating on diesel if the respective unit operates more than 250 hours while combusting diesel in a calendar year; and
- Particulate matter testing for Unit #8.

8.5 Compliance Assurance Monitoring

Compliance assurance monitoring is applicable to permit applications received on or after April 20, 1998, from major sources applying for a Title V air quality operating permit. Xcel Energy's application was received after April 20, 1998. Therefore, compliance assurance monitoring is applicable to any unit that meets the following criteria:

1. The unit is subject to an emission limit or standard for the applicable regulated air pollutant;
2. The unit uses a control device to achieve compliance with any such emission limit or standard; and
3. The unit has potential uncontrolled emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

The Title V air quality operating permit contains emission limits for total suspended particulate matter, sulfur dioxide, nitrogen oxides, volatile organic compounds, and carbon monoxide. Units #4 and #5 each have the potential to emit greater than the major source threshold for particulate matter, sulfur dioxide, nitrogen oxides, volatile organic compounds, and carbon monoxide. Xcel Energy only controls emissions of nitrogen oxides using water injection systems; therefore, nitrogen oxide is the only pollutant that meets the above criteria.

Xcel Energy is exempt from compliance assurance monitoring for nitrogen oxide due to the following reasons:

1. In accordance with § 64.2(b)(1)(iii), the nitrogen oxide emission limitations required by the Acid Rain Program are not required to conduct a compliance assurance monitoring review. The Acid Rain Program contains the applicable monitoring requirements;
2. In accordance with § 64.2(b)(1)(vi), the nitrogen oxide emission limitations or standards which a part 70 or 71 permit specifies a continuous compliance determination method does not require a compliance assurance monitoring review. Xcel Energy must operate continuous emission monitoring systems to determine compliance with the nitrogen oxide emission limits;
3. In accordance with §§ 64.3(d)(1) and 64.3(d)(2)(ii), if a continuous emission monitoring system is required by another program under the Clean Air Act and the continuous emission monitoring system meets the requirements of § 60.13 and 40 CFR Part 60, Appendix B, the continuous emission monitoring system meets the requirement of this part. Xcel Energy's continuous emission monitoring system is required to meet the requirements of § 60.13 and 40 CFR Part 60, Appendix B; and
4. In accordance with ARSD 74:36:16:04, as referenced to 40 CFR § 75.1 the nitrogen oxide continuous emission monitoring system on Units #4, #5, and #8 shall meet the

performance specifications in 40 CFR Part 75, Appendix A. In addition, the nitrogen oxide continuous emission monitoring systems shall meet the quality assurance requirements in 40 CFR Part 75 Appendix B.

8.6 Periodic Monitoring

Periodic monitoring is required for each emission unit that is subject to an applicable requirement at a source subject to Title V of the federal Clean Air Act. Units #4 and #5 are subject to opacity, particulate matter, sulfur dioxide, nitrogen oxide, volatile organic compound, and carbon monoxide limits. Periodic monitoring for opacity will be based on visible emission readings while burning distillate oil and not required for natural gas. Periodic monitoring for particulate matter, volatile organic compounds and carbon monoxide will be based on stack testing requirements. Periodic monitoring for sulfur dioxide emissions will be based on the sulfur content of the natural gas and distillate oil following the 0.37 weight percent limit and New Source Performance Standard Subpart GG's requirements. Periodic monitoring for nitrogen oxide emissions will be based on the continuous emission monitoring system.

Unit #8 is subject to opacity, particulate matter, sulfur dioxide, nitrogen oxide, and carbon monoxide limits. Periodic monitoring for opacity is not required for natural gas combustion. Periodic monitoring for particulate matter will be based on stack testing requirements. Periodic monitoring for sulfur dioxide emissions will be based on the sulfur content of the natural gas following New Source Performance Standard Subpart GG's requirements. Periodic monitoring for nitrogen oxide and carbon monoxide emissions will be based on the continuous emission monitoring system.

8.7 Air Fees

Title V sources are subject to an annual air quality fee. The fee consists of an administrative fee and a per ton fee based on the actual tons per year of pollutant emitted. The pollutants that are charged for include particulate matter, sulfur dioxides, nitrogen oxides, volatile organic compounds, and hazardous air pollutants. The actual emissions are calculated by the department and are based on information provided by the source.

9.0 Recommendation

Based on the above findings, Xcel Energy is required to operate within the requirements stipulated in the following regulations:

- ARSD 74:36:05 – Operating Permits for Part 70 Sources;
- ARSD 74:36:06 – Regulated Air Pollutant Emissions;
- ARSD 74:36:07 – New Source Performance Standards;
- ARSD 74:36:08 – National Emission Standards for Hazardous Air Pollutants;
- ARSD 74:36:11 – Performance Testing;
- ARSD 74:36:12 – Control of Visible Emissions; and
- ARSD 74:37:01 – Air Emission Fees.

Based on information received in the permit application, DANR recommends renewal of the Title V air quality operating permit for Xcel Energy. Questions regarding this permit review should be directed to Connor Weber, Engineer II, Department of Agriculture and Natural Resources – Air Quality Program.