

**AIR EMISSION PERMIT NO. 06100004- 003**

**IS ISSUED TO**

**Minnesota Power**  
Wisconsin Public Power Inc.

**MINNESOTA POWER - BOSWELL ENERGY CENTER**  
1210 3<sup>rd</sup> Street North  
Cohasset, Itasca County, MN 55721-4763

The emission units, control equipment and emission stacks at the stationary source authorized in this permit are as described in the following permit application(s):

Permit Type	Application Date
Total Facility Oper. Permit - Reissuance	September 24, 2001

This permit authorizes the Permittee to operate the stationary source at the address listed above unless otherwise noted in Table A. The Permittee must comply with all the conditions of the permit. Any changes or modifications to the stationary source must be performed in compliance with Minn. R. 7007.1150 to 7007.1500. Terms used in the permit are as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

**Permit Type:** Federal; Pt 70/Major for NSR

**Issue Date:** March 28, 2007

**Expiration:** March 28, 2012

Title I Conditions do not expire.

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Richard J. Sandberg, Manager  
Air Quality Permits Section  
Industrial Division

for Brad Moore  
Commissioner  
Minnesota Pollution Control Agency

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**NOTICE TO THE PERMITTEE:**

Your stationary source may be subject to the requirements of the Minnesota Pollution Control Agency's (MPCA) solid waste, hazardous waste, and water quality programs. If you wish to obtain information on these programs, including information on obtaining any required permits, please contact the MPCA general information number at:

Metro Area	651-296-6300
Outside Metro Area	1-800-657-3864
TTY	651-282-5332

The rules governing these programs are contained in Minn. R. chs. 7000-7105. Written questions may be sent to: Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194.

Questions about this air emission permit or about air quality requirements can also be directed to the telephone numbers and address listed above.

**PERMIT SHIELD:**

Subject to the limitations in Minn. R. 7007.1800, compliance with the conditions of this permit shall be deemed compliance with the specific provision of the applicable requirement identified in the permit as the basis of each condition. Subject to the limitations of Minn. R. 7007.1800 and 7017.0100, subp. 2, notwithstanding the conditions of this permit specifying compliance practices for applicable requirements, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements.

**FACILITY DESCRIPTION:**

The Boswell Energy Center (BEC) is an electric generating facility located adjacent to the Mississippi River in Cohasset, Minnesota. This electric power facility contains steam generating boilers, emergency generators, cooling towers, coal receiving, handling, and storage facilities, and ash handling and storage capabilities. The boilers are coal-fired and have a combined net generating capacity of approximately 1025 megawatts.

All operations and equipment within the facility boundary are established to: (1) provide electrical power for on-site and off-site utilization; (2) provide fuel for electrical power production or support activities; (3) monitor and control air pollutants generated from electrical power production; (4) handle waste energy, wastes, materials produced from the on-site operations; and (5) provide support activities. The description of these operations and equipment are described below.

## **Power Generation**

Power generation occurs by steam generated from four boilers. Boilers No. 1 and 2 are wall-fired units, and Unit 3 is a tangential-fired unit, that discharge emissions to the atmosphere by a common 700-foot stack (Stack 3). Under emergency and testing conditions, Boilers 1 and 2 can also discharge to a separate 250-foot stack (Stack 1). Boiler No. 4 is a tangential-fired unit that discharges air emissions from a 600-foot stack (Stack 4).

Emergency electric power can be supplied to Units 1 through 4 by emergency generators. Units 1 and 2 are powered by a single Liquid Propane (L.P.)-fueled generator. Units 3 and 4 are powered by respective diesel-fueled generators.

## **Fuel for Power Generation and Support Equipment/Activities**

The primary fuel for the boilers is sub-bituminous coal. This coal is received at BEC in unit train loads. BEC normally stores about 350,000 tons of coal on a clay-lined site, but can store up to 1.3 million tons. The facility is designed to handle the coal using numerous pieces of equipment and various handling and storage operations. The equipment and operations surrounding the use of coal are summarized below.

Coal is unloaded from rail cars and transferred to various facility locations to be either: (1) stored prior to crushing and being fed into the boilers; (2) crushed and immediately used by the boilers; (3) retained in the coal cars and transshipped to the Laskin Energy Center; or (4) transferred to trucks to send to other regional coal-using facilities. The existing coal handling equipment and operations are listed as follows:

- Rail unload building and associated totally enclosed conveyor systems;
- Railcar loadout facility lowering well including below ground level live bottom hoppers, belt feeders, and conveyor systems;
- Transfer towers and associated totally enclosed conveyor systems;
- Transfer house and associated totally enclosed conveyor systems;
- Storage silos and associated totally enclosed conveyor systems;
- Crusher houses and associated totally enclosed conveyor systems.

Coal storage occurs in outside storage areas or in storage silos. Since most of the coal handling and storage operations involve enclosed systems, air emissions from these activities are reduced. Nonetheless, these operations have particulate matter controls to remove the possibility of developing explosive conditions.

The fuels used for emergency power generation are liquid propane and diesel fuel (distillate fuel oil). Distillate fuel oil is also used for startup on Boilers 1 through 4. Boilers 1 through 4 can also combust petroleum-derived waste oils (generated within the Minnesota Power system), petroleum distillate solvents, oily sorbents, boiler cleaning agents (generated onsite), wastewater treatment plant sludge, and various oily materials.

## **Air Pollutant Monitoring and Control**

Air pollutants released from electrical power generation result primarily from the burning of coal. Combustion of propane and distillate fuel oil also release air pollutants, but at the BEC facility propane/fuel oil combustion pollutants are released in very minor quantities relative to coal combustion. Pollutants emitted at BEC are the criteria pollutants: Carbon Monoxide (CO), Sulfur Dioxide (SO<sub>2</sub>), Volatile Organic Compounds (VOC), Nitrogen Oxides (NO<sub>x</sub>), Particulate Matter (PM), Particulate Matter less than 10 um in size (PM<sub>10</sub>), and lead. Small quantities of Hazardous Air Pollutants (HAP) have the potential for release in the burning of coal.

All four units are equipped with Continuous Emission Monitoring (CEM) systems required by the Clean Air Act Amendments of 1990. The systems include monitors for SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, volumetric flow, O<sub>2</sub> and opacity. A data acquisition system operates to collect and store emission data from all the CEMs.

The pollutants are currently controlled at BEC through a variety of methods. SO<sub>2</sub> is controlled by a SO<sub>2</sub> absorber (Boiler No. 4 only). The SO<sub>2</sub> absorption is accomplished with the natural alkalinity of the ash from the western sub-bituminous coal or with lime. PM is controlled by fabric filters (baghouses) (Boilers 1 and 2), wet particulate scrubbers (Boilers 3 and 4), and an electrostatic precipitator (ESP) (Boiler 4). Control of PM surrounding coal handling and storage occurs through baghouses and vacuum cleaning. Boiler No. 4 operates with over-fire air to reduce NO<sub>x</sub> emissions. The Boiler No. 3 wet particulate scrubber also reduces SO<sub>2</sub> emissions. The pollution control equipment for all four units have demonstrated effectiveness in reducing HAP emissions.

## **Waste Heat, Wastes, and Materials**

Waste heat from electricity production is dissipated through the use of noncontact cooling towers (Boilers No. 3 and 4) and once through cooling water condensers (Boilers No. 1 and 2). Cooling water is drawn from the Mississippi River (Blackwater Lake) and discharged back into the Mississippi River. Some of the waste energy is used to heat the energy production-related buildings and a separate greenhouse. The cooling tower systems blow down is routed to an on-site wastewater treatment system.

Wastes are generated from the burning of fuels and in maintenance of equipment used in support of energy production activities. The burning of fuels produces ash. Some ash is sent to ash storage ponds within facility boundaries in a wet slurry form. Fly ash from Units 1 and 2 is also transported to Boiler No. 4 and directly injected to the boiler for additional control of fine particulate emissions. Waste generated from maintenance activities include oil and other waste materials from truck, front end loader, and other vehicle maintenance.

Additional material is generated in the handling, transporting, and pulverizing of coal. The handling, transport, and pulverizing of coal produces coal dust which is collected in air pollution control devices (baghouses), collected by a facility vacuum system, or washed to floor drains. The collected coal dust is returned to storage silos or appropriate conveyance equipment. Consequently, the collected material is recycled on-site except for what is released as fugitive emissions from the coal operations.

## **Support Activities**

Support activities include building, conveyor and vehicle maintenance; general facility activities; energy production equipment maintenance; piping installation and maintenance; and ash-pond inspection and maintenance. These activities can include painting, welding, and cleaning operations. In terms of air emission regulations, these activities are considered insignificant activities for permitting purposes.

## **Changes Authorized by this Permit**

This permit includes a major amendment to the facility's total facility operating air emission permit. It allows for a project to be conducted to comply with what Minnesota Power assumes will be the final outcome of EPA's Regional Haze Rule (RHR), Clean Air Interstate Rule (CAIR), Minnesota's Mercury Reduction Act (Act) and EPA's Clean Air Mercury Rule and any related Minnesota implementation procedures for these rules. Power boiler No. 3 will be retrofitted with Low NO<sub>x</sub> burners, over fire air and selective catalytic reduction for nitrogen oxides control. It will be retrofitted with a baghouse filter for particulate and mercury control, and finally, with a wet scrubber for SO<sub>2</sub> control. Currently the only control equipment serving the boiler is a wet scrubber for particulate emissions. Combustion controls will be installed and/or updated for CO control.

The control equipment that Minnesota Power is proposing to install, along with proposed emissions limits are consistent with Federal New Source Review Best Available Control Technologies.

There will be new equipment installed for: delivery, storage and handling of mercury removal additive (if needed), ammonia for NO<sub>x</sub> control and limestone for SO<sub>2</sub> removal, and handling of dry fly ash from the fabric filter. There will also be a new emergency generator installed to allow for the orderly shutdown of the new pollution control equipment in the event of a power outage.

Lastly, this permit incorporates a requirement for the installation of mercury monitors for Units 3 and 4.

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-1

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Table A contains limits and other requirements with which your facility must comply. The limits are located in the first column of the table (What To do). The limits can be emission limits or operational limits. This column also contains the actions that you must take and the records you must keep to show that you are complying with the limits. The second column of Table A (Why to do it) lists the regulatory basis for these limits. Appendices included as conditions of your permit are listed in Table A under total facility requirements.**

**Subject Item: Total Facility**

What to do	Why to do it
DETERMINING IF A PROJECT/MODIFICATION IS SUBJECT TO NEW SOURCE REVIEW	hdr
<p>These requirements apply where there is a reasonable possibility that a proposed project, analyzed using the actual-to-projected-actual (ATPA) test and found to not be part of a major modification, may result in a significant emissions increase. If the ATPA test is not used for a particular project, or if there is not a reasonable possibility that the proposed project could result in a significant emissions increase, then these requirements do not apply to that project.</p> <p>Even though a particular modification is not subject to New Source Review, a permit amendment, recordkeeping, or notification may still be required under Minn. R. 7007.1150 - 7007.1500.</p>	Title I Condition: 40 CFR Section 52.21(r)(6) and Minn. R. 7007.3000
<p>Preconstruction Documentation -- Before beginning actual construction on a project, the Permittee shall document the following information:</p> <ol style="list-style-type: none"> <li>1. A description of the project</li> <li>2. Identification of the emission unit(s) whose emissions of an NSR pollutant could be affected</li> <li>3. A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including the baseline actual emissions, the potential emissions, the projected actual emissions, the amount of emissions excluded due to increases not associated with the modification and that the unit(s) could have accommodated during the baseline period, an explanation of why the amounts were excluded, and any creditable contemporaneous increases and decreases that were considered in the determination.</li> </ol> <p>The Permittee shall maintain records of this documentation.</p>	Title I Condition: 40 CFR Section 52.21(r)(6) and Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 & 5
The Permittee shall monitor the actual emissions of any regulated NSR pollutant that could increase as a result of the project and that were analyzed using the ATPA test, and the potential emissions of any regulated NSR pollutant that could increase as a result of the project and that were analyzed using potential emissions. The Permittee shall calculate and maintain a record of the sum of the actual and potential (if used in the analysis) emissions of the regulated pollutant, in tons per year on a calendar year basis, for a period of 5 years following resumption of regular operations after the change, or for a period of 10 years following resumption of regular operations after the change if the project increases the design capacity of or potential to emit of any unit associated with the project.	Title I Condition: 40 CFR Section 52.21(r)(6) and Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 & 5
Before beginning actual construction of any project which includes any electric utility steam generating unit (EUSGU), the Permittee shall submit a copy of the preconstruction documentation (items 1-3 under Preconstruction Documentation, above) to the Agency.	Title I Condition: 40 CFR Section 52.21(r)(6)(ii) and Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 & 5
<p>For any project which includes any EUSGU, the Permittee must submit an annual report to the Agency, within 60 days after the end of the calendar year. The report shall contain:</p> <ol style="list-style-type: none"> <li>a. The name and ID number of the facility, and the name and telephone number of the facility contact person</li> <li>b. The quantified annual emissions analyzed using the ATPA test, plus the potential emissions associated with the same project and analyzed using potential emissions</li> <li>c. Any other information, such as an explanation as to why the summed emissions differ from the preconstruction projection, if that is the case.</li> </ol>	Title I Condition: 40 CFR Section 52.21(r)(6) and Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 & 5

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-2**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

For any project which does not include any EUSGU, the Permittee must submit a report to the Agency if the annual summed (actual plus potential, if applicable) emissions differ from the preconstruction projection and exceed the baseline actual emissions by a significant amount as listed at 40 CFR Section 52.21(b)(23). Such report shall be submitted to the Agency within 60 days after the end of the year in which the exceedances occur. The report shall contain:	Title I Condition: 40 CFR Section 52.21(r)(6) and Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 & 5
a. The name and ID number of the facility, and the name and telephone number of the facility contact person b. The annual emissions (actual plus potential, if any part of the project was analyzed using potential emissions) for each pollutant for which the preconstruction projection and significant emissions rate is exceeded. c. Any other information, such as an explanation as to why the summed emissions differ from the preconstruction projection.	
OPERATIONAL REQUIREMENTS	hdr
Circumvention: Do not install or use a device or means that conceals or dilutes emissions, which would otherwise violate a federal or state air pollution control rule, without reducing the total amount of pollutant emitted.	Minn. R. 7011.0020
Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated, unless otherwise noted in Table A.	Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J)
Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan for all air pollution control equipment. At a minimum, the O & M plan shall identify all air pollution control equipment and control practices and shall include a preventative maintenance program for the equipment and practices, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment and practices to proper operation to meet applicable permit conditions, a description of the employee training program for proper operation and maintenance of the control equipment and practices, and the records kept to demonstrate plan implementation.	Minn. R. 7007.0800, subp. 14 and Minn. R. 7007.0800, subp. 16(J)
Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150.	Minn. R. 7011.0150
Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state requirement only and is not federally enforceable.	Minn. R. 7030.0010-7030.0080
Inspections: Upon presentation of credentials and other documents as may be required by law, allow the Agency, or its representative, to enter the Permittee's premises, to have access to and copy any records required by this permit, to inspect at reasonable times (which include any time the source is operating) any facilities, equipment, practices or operations, and to sample or monitor any substances or parameters at any location. The Permittee may require that MPCA inspectors be accompanied by MP staff during the inspection. Permittee's staff shall be available whenever the plant is operating.	Minn. R. 7007.0800, subp. 9(A)
Comply with general conditions listed in Minn. R. 7007.0800, subp. 16.	Minn. R. 7007.0800, subp. 16
Comply with Fugitive Emissions Control Plan: Follow the actions and record keeping specified in the control plan. The plan may be amended with the Commissioner's approval. If the Commissioner determines that you are out of compliance with Minn. R. 7011.0150 or the control plan, then you may be required to amend the control plan and/or install and operate particulate matter ambient monitors.	Minn. Stat. Section 116.07, subd. 4a; Minn. R. 7007.0100; Minn. R. 7007.0800, subp. 2; Minn. R. 7011.0150; Minn. R. 7009.0020
Oily Floor Dry: Limit combustion to: 1) cellulose based only, 2) 25 tons per year, and 3) 1.25 tons per hour.	Title I Condition: To avoid classification as a major modification under 40 CFR Section 52.21 and Minn. R. 7007.3000
The following does not apply to Boilers No. 001, 002, 003, and 004. These units contain specific operating and/or production limits requirements.  Operating and/or production limits will be placed on emission units based on operating conditions during compliance testing. Limits set as a result of a compliance test (conducted before or after permit issuance) apply until new operating/production limits are set following formal review of a performance test as specified by Minn. R. 7017.2025.	Minn. R. 7017.2025
PERFORMANCE TESTING	hdr



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-3**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

<p>Performance Test Notifications and Submittals:</p> <p>Performance Tests are due as outlined in Tables A and B of the permit. See Table B for additional testing requirements.</p> <p>Performance Test Notification (written): due 30 days before each Performance Test  Performance Test Plan: due 30 days before each Performance Test  Performance Test Pre-test Meeting: due 7 days before each Performance Test  Performance Test Report: due 45 days after each Performance Test  Performance Test Report - Microfiche Copy: due 105 days after each Performance Test</p> <p>The Notification, Test Plan, and Test Report may be submitted in alternative format as allowed by Minn. R. 7017.2018.</p>	<p>Minn. Rs. 7017.2030, subp. 1-4, 7017.2018 and Minn. R. 7017.2035, subp. 1-2</p>
<p>Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C.</p>	<p>Minn. R. ch. 7017</p>
<p><b>MONITORING REQUIREMENTS</b></p>	<p>hdr</p>
<p>Monitoring Equipment Calibration: Annually calibrate all required monitoring equipment (any requirements applying to continuous emission monitors are listed separately in this permit).</p>	<p>Minn. R. 7007.0800, subp. 4(D)</p>
<p>Operation of Monitoring Equipment: Unless otherwise noted in Tables A, B, and/or C, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system.</p>	<p>Minn. R. 7007.0800, subp. 4(D)</p>
<p><b>RECORDKEEPING</b></p>	<p>hdr</p>
<p>Recordkeeping: Maintain records describing any insignificant modifications (as required by Minn. R. 7007.1250, subp. 3) or changes contravening permit terms (as required by Minn. R. 7007.1350, subp. 2), including records of the emissions resulting from those changes.</p>	<p>Minn. R. 7007.0800, subp. 5(B)</p>
<p>Record keeping: Retain all records at the stationary source for a period of five (5) years from the date of monitoring, sample, measurement, or report. Records which must be retained at this location include all calibration and maintenance records, all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Records must conform to the requirements listed in Minn. R. 7007.0800, subp. 5(A).</p>	<p>Minn. R. 7007.0800, subp. 5(C)</p>
<p><b>REPORTING</b></p>	<p>HDR</p>
<p>Application for Permit Amendment: If you need a permit amendment, submit application in accordance with the requirements of Minn. R. 7007.1150 through Minn. R. 7007.1500. Submittal dates vary, depending on the type of amendment needed.</p>	<p>Minn. R. 7007.1150 through Minn. R. 7007.1500</p>
<p>Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment.</p>	<p>Minn. R. 7019.1000, subp. 1</p>
<p>Notification of Deviations Endangering Human Health or the Environment Report: Within 2 working days of discovery, notify the Commissioner in writing of any deviation from permit conditions which could endanger human health or the environment. Include the following information in this written description:</p> <ol style="list-style-type: none"> <li>1. the cause of the deviation;</li> <li>2. the exact dates of the period of the deviation, if the deviation has been corrected;</li> <li>3. whether or not the deviation has been corrected;</li> <li>4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and</li> <li>5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.</li> </ol>	<p>Minn. R. 7019.1000 subp. 1</p>
<p>Shutdown Notifications: Notify the Commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the owner or operator does not have advance knowledge of the shutdown, notification shall be made to the Commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 3.</p> <p>At the time of notification, the owner or operator shall inform the Commissioner of the cause of the shutdown and the estimated duration. The owner or operator shall notify the Commissioner when the shutdown is over.</p>	<p>Minn. R. 7019.1000, subp. 3</p>

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-4**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 2.  At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over.	Minn. R. 7019.1000, subp. 2
Shutdown and Breakdown Reporting Requirement for the Dust Collector Systems for Material Handling Equipment: Shutdowns and breakdowns shall be reported on a quarterly basis to the Agency. The quarterly report shall include an identification of the dust collector that broke down or was shutdown, the time and reason for the breakdown or shutdown, a description of any repairs made, and the date and time the dust collector was placed back in service.	Minn. R. 7019.1000, subp. 2
Emission Inventory Report: due on or before April 1 of each calendar year following permit issuance. To be submitted on a form approved by the Commissioner.	Minn. R. 7019.3000 through Minn. R. 7019.3100
Emission Fees: due 60 days after receipt of an MPCA bill	Minn. R. 7002.0005 through Minn. R. 7002.0095
Extension Requests: The permittee may apply for an Administrative Amendment to extend a deadline in a permit by no more than 120 days, provided the proposed deadline extension meets the requirements of Minn. R. 7007.1400, subp. 1(H).	Minn. R. 7007.1400, subp. 1(H)
ACID RAIN PROGRAM REQUIREMENTS	hdr
Emissions from the stationary source cannot exceed any allowances that the source lawfully holds under federal acid rain regulations, except as allowed by Minn. R. 7007.0800, subp. 7.	Minn. R. 7007.0800, subp. 7
Acid Rain Certification Report: due 60 days after end of each calendar year.	40 CFR Section 72.90(b) and 40 CFR Section 72.90(c)
If the unit has excess emissions, the designated representative shall submit a proposed offset plan in accordance with 40 CFR Section 72.9(e).	40 CFR Section 72.9(e)
Keep the certificate of representation, all emissions monitoring information, copies of all reports, compliance certifications and related submissions and all records made or required under the Acid Rain Program on site for a period of 5 years from the date the document was created.	40 CFR Section 72.9(f)
Hold allowances as of the allowance transfer deadline, in the facility's compliance account. Allowances may not be less than the total annual emissions of sulfur dioxide from the previous calendar year from the facility.	40 CFR Section 72.9(c)
DISPERSION MODELING REQUIREMENTS	hdr
The Permittee shall comply with National Primary and Secondary Ambient Air Quality Standards, 40 CFR pt. 50, and the Minnesota Ambient Air Quality Standards, Minn. R. 7009.0010 to 7009.0080. Compliance shall be demonstrated upon written request by the MPCA.	40 CFR pt. 50; Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080
Parameters Used in Modeling: The parameters used in the modeling performed for Title V modeling for this facility are listed in the Appendix of this permit. If the Permittee intends to change any of these parameters, the Permittee must submit the revised parameters to the Commissioner and receive written approval before making any changes. The revised parameter information submittal must include, but is not limited to: the locations, heights and diameters of the stacks; locations and dimensions of nearby buildings; velocity and temperatures of the gases emitted; and the emission rates. The plume dispersion characteristics due to the parameter revisions must equal or exceed the dispersion characteristics modeled for this permit unless modeling is re-performed, and the Permittee shall demonstrate this in the proposal.	Minn. R. 7009.0020; Minn. R. 7007.0800, subp. 2
The parameters used for modeling of SV003 were incorrect, however the proposed air pollution control installation project authorized by this permit action will change stack parameters for Boiler #3 in any event. So, this will require re-performing the Title V dispersion modeling that has thus far been completed for PM10, SO2 and NOx as is outlined in Table B.	continued from above

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-5**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: GP 002 Opacity Monitors****Associated Items:** MR 005 Blr 4 Opacity

MR 020 Blr 1 Opacity

MR 021 Blr 2 Opacity

MR 027 Boiler 3 Opacity

What to do	Why to do it
CONTINUOUS OPACITY MONITORING SYSTEMS (COMS) Requirements (Additional requirements are located under the associated MR subject items and in Table B)	hdr
All COMS shall complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle of data for each successive 6-minute period.	Minn. R. 7017.1200, subp. 1, 2 & 3; 40 CFR Section 60.13(e)(1); 40 CFR Section 60.13(h)
Continuous Operation: COMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A COMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment.  Acceptable monitor downtime includes reasonable periods as listed in Items A, B, C and D of Minn. R. 7017.1090, subp. 2.	Minn. R. 7017.1090, subp. 1; 40 CFR Section 60.13(e)
COMS QA/QC: The owner or operator of an affected facility is subject to the performance specifications listed in 40 CFR pt. 60, Appendix B and shall operate, calibrate, and maintain each COMS according to the QA/QC procedures in Minn. R. 7017.1210.	40 CFR Section 60.13(a); Minn. R. 7017.1210
COMS Daily Calibration Drift Check: The Permittee must automatically, intrinsic to the opacity monitor, check the zero and upscale (span) calibration drifts at least once daily. The acceptable range is as defined in 40 CFR pt. 60, Appendix B, PS-1. The optical surfaces shall be cleaned when the cumulative automatic zero compensation exceeds 4 percent opacity. Minimum procedures must include an automated method for producing a simulated zero opacity condition and an upscale opacity condition as specified in 40 CFR 60.13(d)(2).	Minn. R. 7017.1210, subp. 2; 40 CFR Section 60.13(d)(I) regarding COMS and 60.13(d)(2)
Attenuator Calibration: The Permittee shall have an independent testing company conduct calibrations of each of the neutral density filters used in the calibration error audit according to the procedure in Code of Federal Regulations, Title 40, Part 60, Appendix B, Section 7.1.3.1 within the time frame of opacity stability guaranteed by the attenuator manufacturer. The manufacturer's guarantee of stability shall be on site available for inspection.	Minn. R. 7017.1210, subp. 4
Recordkeeping: The owner or operator must retain records of all COMS monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-6**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: GP 003 NOx, CO and SO2 Monitors****Associated Items:** MR 002 Blr 1, 2, and 3 SO2

MR 004 Blr 1 and 2 NOx

MR 007 Blr 4 SO2

MR 008 Blr 4 NOx

MR 016 Blr 3 NOx

MR 024 Boiler 3 CO

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are located under the associated MR subject items and in Table B)	hdr
REQUIREMENTS APPLICABILITY  For GP 003, Part 75 and Minn. Rule requirements apply to all monitors except MR 024. For MR 024, only Minn. Rule requirements apply.	hdr
CEMS QA/QC: The owner or operator of an affected facility shall operate, calibrate, and maintain each CEMS according to the QA/QC procedures in 40 CFR pt. 75, appendix B as amended.	40 CFR Section 75.21
Daily Calibration error (CE) Test: conduct daily CE testing on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, appendix B.	40 CFR pt. 75, Appendix B, section 2.1
Relative Accuracy Test Audit (RATA) Notification: due 30 days before CEMS Relative Accuracy Test Audit (RATA)).	Minn. R. 7017.1180, subp. 2
Recordkeeping: The owner or operator must retain records of all CEMS monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130; and 40 CFR Part 75, Subpart F
Continuous Operation: CEMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A CEMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment.	40 CFR Section 60.13(e); Minn. R. 7017.1090

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-7**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: GP 004 Boilers 1-4 Sulfur Dioxide Limits****Associated Items:** EU 001 Power Boiler 1

EU 002 Power Boiler 2

EU 003 Power Boiler 3

EU 004 Power Boiler 4

What to do	Why to do it
<b>BOILER 3 AND 4 COMBINED LIMITS</b>	hdr
When EU 001 and EU 002 are not operating, sulfur dioxide emissions are limited to less than or equal to the following:  Condition 1) 3.52 lb/mmBtu for SV 003 and 1.2 lb/mmBtu for SV 004, both on a one-hour average; OR,  Condition 2) 4.0 lb/mmBtu for SV 003 and 0.88 lb/mmBtu for SV 004, both on a one-hour average; OR,  Condition 3) 3.67 lb/mmBtu for SV 003 and 1.10 lb/mmBtu for SV 004, both on a one-hour average.	Minn. R. ch. 7009; 40 CFR pt. 50
<b>BOILER 1 EMISSION LIMITS</b>	hdr
When the EU 001 flue gasses are vented through SV 001: Sulfur Dioxide: less than or equal to 1.18 lbs/million BTU heat input using 1 Hour Average	Minn. R. 7009.0020
Sulfur Dioxide: less than or equal to 4.0 lbs/million Btu heat input using 1-Hour Average and a 3-Hour Average for solid fuels, and 2.0 lbs/mmBtu when burning liquid fuels. When solid and liquid fossil fuels are burned simultaneously in any combination, the applicable standard shall be determined by proration using the following formula: $w = [2y + 4z] / (y + z)$ where y is the % heat input from liquid fossil fuel and z is the % heat from solid fuels. This limit applies only when EU001 is vented through SV003.	Minn. R. 7011.0510, subp. 1 Minn. R. 7009
<b>BOILER 2 EMISSION LIMITS</b>	hdr
When EU 002 flue gasses are vented through SV 001. Sulfur Dioxide: less than or equal to 1.18 lbs/million Btu heat input using 1-Hour Average	Minn. R. 7009.0020
Sulfur Dioxide: less than or equal to 4.0 lbs/million Btu heat input using 1-Hour Average and a 3-Hour Average for solid fuels, and 2.0 lbs/mmBtu when burning liquid fuels. When liquid and solid fossil fuels are burned simultaneously in any combination, the applicable standard shall be determined by proration using the following formula: $w = [2y + 4z] / (y + z)$ where y is the % heat input from liquid fossil fuel and z is the % heat from solid fuels. This limit applies only when EU 002 is vented through SV 003.	Minn. R. 7011.0510, subp. 1 Minn. R. 7009
<b>BOILER 3 LIMITS</b>	hdr
Sulfur Dioxide: less than or equal to 2.97 lbs/million Btu heat input using 1-Hour Average when EU 001 and EU 002 are operating, and the EU 001 and EU 002 emissions are vented through SV 001.	Minn. R. 7009.0020
Sulfur Dioxide: less than or equal to 0.09 lbs/million Btu heat input based on a 30-day rolling average. This limit does not apply during times of startup, shutdown or malfunction. (Boiler 3 limit). This limit applies regardless of the operation and venting of the other boilers.  This limit applies after return to regular operation of Unit 3 following modification of the boiler and its pollution control equipment stream.	Minn. R. 7007.0800, subp. 2
Sulfur Dioxide: less than or equal to 4.0 lbs/million Btu heat input using 1-Hour Average and a 3-Hour Average for solid fuels, and 2.0 lbs/mmBtu when burning liquid fuels. When solid and liquid fossil fuels are burned simultaneously in any combination, the applicable standard shall be determined by proration using the following formula: $w = [2y + 4z] / (y + z)$ where y is the % heat input from liquid fossil fuel and z is the % heat from solid fuels. The EU003 sulfur dioxide limit applies regardless if EU001 and EU002 are operating.	Minn. R. 7011.0510, subp. 1 Minn. R. 7009
<b>BOILER 4 EMISSION LIMITS</b>	hdr

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-8**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Sulfur Dioxide: less than or equal to 1.2 lbs/million Btu heat input using 1-Hour Average period for solid fossil fuel, and 0.8 lb/million BTU using 1 Hour Average period for liquid fossil fuel. When solid and liquid fossil fuels are burned simultaneously in any combination, the applicable standard shall be determined by proration using the following formula: $w = [0.8y + 1.2z] / (y + z)$ where y is the % heat input from liquid fossil fuel and z is the % heat from solid fuels.	Title I Condition: 40 CFR Section 52.21(j) PSD BACT limit and ambient impacts analysis; 40 CFR Section 60.43
Sulfur Dioxide: less than or equal to 0.33 lbs/million Btu heat input based on an annual average.	Minn. R. 7021.0050, subp. 5

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-9**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: GP 005 Low Temperature Fabric Filters**

**Associated Items:** CE 007 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 008 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 009 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 010 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 013 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 014 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 015 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 016 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 017 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
 CE 018 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

What to do	Why to do it
The Permittee shall operate and maintain the control equipment such that it achieves an overall control efficiency for Total Particulate Matter: greater than or equal to 99 percent control efficiency	Minn. R. 7007.0800, subp. 2 and 14
The Permittee shall operate and maintain the fabric filter at all times that any emission unit controlled by the fabric filter is in operation. The Permittee shall document periods of non-operation of the control equipment.	Minn. R. 7007.0800, subp. 2 and 14
Visible Emissions: The Permittee shall check the fabric filter stacks for any visible emissions once each day of operation during daylight hours.	Minn. R. 7007.0800, subp. 4 and 5
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14
Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur: - visible emissions are observed; or - the fabric filter or any of its components are found during the inspections to need repair. Corrective actions shall eliminate visible emissions, and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the fabric filter. The Permittee shall keep a record of the type and date of any corrective action taken for each filter.	Minn. R. 7007.0800, subp. 4, 5, and 14
Periodic Inspections: At least once per calendar quarter, or more frequently as required by the manufacturing specifications, the Permittee shall inspect the control equipment components. The Permittee shall maintain a written record of these inspections.	Minn. R. 7007.0800, subp. 4, 5 and 14

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-10**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 001 Power Boiler 1**Associated Items:** CE 001 Fabric Filter - High Temperature, i.e., T>250 Degrees F

GP 004 Boilers 1-4 Sulfur Dioxide Limits

MR 002 Blr 1, 2, and 3 SO2

MR 003 Blr 1, 2, and 3 CO2

MR 004 Blr 1 and 2 NOx

MR 017 Blr 1 and 2 O2

MR 020 Blr 1 Opacity

SV 001

SV 003

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.1 lbs/million BTU heat input	Title I condition: 40 CFR Section 52.21(k) (ambient air impacts analysis); also meets the requirements of Minn. R. 7011.0510, subp. 1
Opacity: less than or equal to 20 percent opacity using 6-minute Average except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0510, subp. 2
See GP004 for sulfur dioxide limits.	hdr
Comply with the applicable Acid Rain emissions limitation for sulfur dioxide.	40 CFR Section 72.9(c)(1)(ii), 40 CFR Section 72.9(g)(4)
NOx Averaging Plan  Maintain an annual average NOx emission rate of 0.46 lbs/MMBtu and limit the annual heat input to less than or equal to 3,500,000 mmBtu per year.  OR  Maintain a Btu-weighted annual average emission rate in lbs/mmBtu, averaged over the units specified in the NOx averaging plan, that is less than or equal to the Btu-weighted annual average emission rate averaged over the same units had they each been operated during the same period of time in compliance with the applicable emission limitations in 40 CFR Sections 76.5, 76.6, or 76.7. Units covered in the plan are:  Plant                      Boiler ID#  Clay Boswell              1, 2, 3, 4 Syl Laskin                1, 2 Taconite Harbor        1, 2, 3	40 CFR Section 76.11 Minn. R. 7011.0553
OPERATIONAL LIMITS AND REQUIREMENTS	hdr
Fuel use: limited to sub-bituminous coal, boiler cleaning agents, distillate oil, oily coal, used oil, and oily paper-based floor dry.	Minn. R. 7007.0800, subp. 2
Boiler cleaning agents limited to: EDTA type and Ammonium Bromate, are generated on-site, 5% of total mass input, oxygen limited to 3% or greater, agents may only be burned while the boiler is operating at 75 percent of rated capacity or greater.	Minn. R. 7007.0800, subp. 2
Burn off-specification and on-specification used oil in accordance with Minn. R. ch. 7045, not to exceed 17.5% of rated heat input on an hourly basis (equal to 963 gallons/hr.).	Minn. R. 7007.0800, subp. 2
Vent all emissions to a fabric filter that meets the requirements of CE001 for particulate matter control when burning coal. The fabric filter may be bypassed during startup.  Bypassing of the fabric filter shall be for as short a time as is practicable while avoiding damage to the fabric filter and its components, but shall not exceed 8 hours.	Title I Condition: control of particulate emissions.
CONTINUOUS MONITORING REQUIREMENTS	hdr



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-11**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

The owner or operator shall measure opacity, and all SO <sub>2</sub> , NO <sub>x</sub> , and CO <sub>2</sub> emissions from affected units in accordance with 40 CFR Section 75.10. See GP002 for requirements regarding opacity monitoring, and GP003 for requirements regarding SO <sub>2</sub> and NO <sub>x</sub> monitoring. The SO <sub>2</sub> and NO <sub>x</sub> monitors shall be capable of producing emission rates in units of lb/mmBtu on a one-hour average, a three-hour average and on a 30-day rolling average.	40 CFR Section 75.10 Minn. R. 7017.1020
Operate and maintain the continuous opacity monitor as a partial indicator of compliance with the particulate matter limit.	40 CFR Part 64
Vendor Certifications when emissions are vented through SV001: For all coal burned in EU001 when emissions are vented through SV001, maintain vendor information on-site that documents coal sulfur content in percent by weight and heat content in Btu per pound. Records shall be maintained for a minimum of five years and include calculations that convert heat and sulfur content data to EU001 SO <sub>2</sub> emissions in lb/mmBtu. The calculated SO <sub>2</sub> emission rate shall be used to determine compliance with the applicable SO <sub>2</sub> emission limit.	Minn. R. 7007.0800, subp. 2
Mercury Emissions Monitoring: Install and operate a Hg CEMS to measure mercury emissions by January 1, 2009 or as allowed by the referenced Rule.	40 CFR Part 75, subp. I
PERFORMANCE TESTING	hdr
Performance Test: due before end of each 60 months starting 09/16/1997 to determine compliance with the Title I condition particulate matter emission limit. The tests shall be conducted at an interval not to exceed 60 months between test dates.	Title I Condition: monitoring for the particulate matter emission limit set under 40 CFR 52.21; Minn. R. 7017.2020, subp. 1, and 40 CFR Part 64
Boiler Alternative Operating Conditions for Performance Testing:  Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing.  In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, Subp. 2(A) and 3(B)
Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing:  If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited on an 8-hour block average based on the following:  (1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate.  (2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate.  In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, Subp. 3(B)
STET (Short Term Emergency and Testing) Operating hours limit:  The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.	Minn. R. 7007.0800, Subp. 2.
STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing:  If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average operating rate achieved during that performance test.  If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test.  In no case will STET operation be higher than allowed by an existing permit condition.	Minn. R. 7007.0800, Subp. 2.

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Minnesota Power Inc - Boswell Energy Ctr  
Permit Number: 06100004 - 003

The results of a performance test are not final until issuance of a review letter by MPCA, unless specified otherwise by Minn. R. 7017.2001 - 7017.2060.	Minn. R. 7017.2020, Subp. 4.
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**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-13**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 002 Power Boiler 2**Associated Items:** CE 002 Fabric Filter - High Temperature, i.e., T>250 Degrees F

GP 004 Boilers 1-4 Sulfur Dioxide Limits

MR 002 Blr 1, 2, and 3 SO2

MR 003 Blr 1, 2, and 3 CO2

MR 004 Blr 1 and 2 NOx

MR 017 Blr 1 and 2 O2

MR 021 Blr 2 Opacity

SV 001

SV 003

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.1 lbs/million BTU heat input	Title I condition: 40 CFR Section 52.21(k) (ambient air impacts analysis); also meets the requirements of Minn. R. 7011.0510, subp. 1
Opacity: less than or equal to 20 percent opacity using 6-minute Average except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0510, subp. 2
See GP004 for sulfur dioxide limits.	hdr
Comply with the applicable Acid Rain emissions limitation for sulfur dioxide.	40 CFR Section 72.9(c)(1)(ii), 40 CFR Section 72.9(g)(4)
NOx Averaging Plan  Maintain an annual average NOx emission rate of 0.46 lbs/MMBtu and limit the annual heat input to less than or equal to 3,500,000 mmBtu per year.  OR  Maintain a Btu-weighted annual average emission rate in lbs/mmBtu, averaged over the units specified in the NOx averaging plan, that is less than or equal to the Btu-weighted annual average emission rate averaged over the same units had they each been operated during the same period of time in compliance with the applicable emission limitations in 40 CFR Sections 76.5, 76.6, or 76.7. Units covered in the plan are:  Plant                      Boiler ID#  Clay Boswell              1, 2, 3, 4 Syl Laskin                1, 2 Taconite Harbor        1, 2, 3	40 CFR Section 76.11 Minn. R. 7011.0553
OPERATIONAL LIMITS AND REQUIREMENTS	hdr
Fuel use: limited to sub-bituminous coal, boiler cleaning agents, distillate oil, oily coal, used oil, and oily paper-based floor dry.	Minn. R. 7007.0800, subp. 2
Boiler cleaning agents limited to: EDTA type and Ammonium Bromate, are generated on-site, 5% of total mass input, oxygen limited to 3% or greater, agents may only be burned while the boiler is operating at 75 percent of rated capacity or greater.	Minn. R. 7007.0800, subp. 2
Burn off-specification and on-specification used oil in accordance with Minn. R. ch. 7045, not to exceed 17.5% of rated heat input on an hourly basis (equal to 963 gallons/hr.).	Minn. R. 7007.0800, subp. 2
Vent all emissions to a fabric filter that meets the requirements of CE002 for particulate matter control when burning coal. The fabric filter may be bypassed during startup.  Bypassing of the fabric filter shall be for as short a time as is practicable while avoiding damage to the fabric filter and its components, but shall not exceed 8 hours.	Title I Condition: control of particulate emissions.
CONTINUOUS MONITORING REQUIREMENTS	hdr

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-14**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

The owner or operator shall measure opacity, and all SO <sub>2</sub> , NO <sub>x</sub> , and CO <sub>2</sub> emissions from affected units in accordance with 40 CFR Section 75.10. See GP002 for requirements regarding opacity monitoring, and GP003 for requirements regarding SO <sub>2</sub> and NO <sub>x</sub> monitoring. The SO <sub>2</sub> and NO <sub>x</sub> monitors shall be capable of producing emission rates in units of lb/mmBtu on a one-hour average, a three-hour average and on a 30-day rolling average.	40 CFR Section 75.10 Minn. R. 7017.1020
Operate and maintain the continuous opacity monitor as a partial indicator of compliance with the particulate matter limit.	40 CFR Part 64
Vendor Certifications when emissions are vented through SV001: For all coal burned in EU002 when emissions are vented through SV001, maintain vendor information on-site that documents coal sulfur content in percent by weight and heat content in Btu per pound. Records shall be maintained for a minimum of five years and include calculations that convert heat and sulfur content data to EU002 SO <sub>2</sub> emissions in lb/mmBtu. The calculated SO <sub>2</sub> emission rate shall be used to determine compliance with the applicable SO <sub>2</sub> emission limit.	Minn. R. 7007.0800, subp. 2
Mercury Emissions Monitoring: Install and operate a Hg CEMS to measure mercury emissions by January 1, 2009 or as allowed by the referenced Rule.	40 CFR Part 75, subp. I
PERFORMANCE TESTING	hdr
Performance Test: due before end of each 60 months starting 09/16/1997 to determine compliance with the Title I condition particulate matter emission limit. The tests shall be conducted at an interval not to exceed 60 months between test dates.	Title I Condition: monitoring for the particulate matter emission limit set under 40 CFR 52.21; Minn. R. 7017.2020, subp. 1, and 40 CFR Part 64
Boiler Alternative Operating Conditions for Performance Testing:  Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing.  In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, Subp. 2(A) and 3(B)
Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing:  If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited on an 8-hour block average based on the following:  (1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate.  (2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate.  In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, Subp. 3(B)
STET (Short Term Emergency and Testing) Operating hours limit:  The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.	Minn. R. 7007.0800, Subp. 2.
STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing:  If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average operating rate achieved during that performance test.  If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test.  In no case will STET operation be higher than allowed by an existing permit condition.	Minn. R. 7007.0800, Subp. 2.

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

Facility Name:      Minnesota Power Inc - Boswell Energy Ctr  
Permit Number:      06100004 - 003

The results of a performance test are not final until issuance of a review letter by MPCA, unless specified otherwise by Minn. R. 7017.2001 - 7017.2060.	Minn. R. 7017.2020, Subp. 4.
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**TABLE A: LIMITS AND OTHER REQUIREMENTS**
**A-16**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: EU 003 Power Boiler 3**

**Associated Items:** CE 012 Wet Scrubber - High Efficiency  
 CE 019 Modified Furnace or Burner Design  
 CE 020 Catalytic Reduction  
 CE 021 Fabric Filter - High Temperature, i.e., T>250 Degrees F  
 CE 022 Wet Limestone Injection  
 GP 004 Boilers 1-4 Sulfur Dioxide Limits  
 MR 002 Blr 1, 2, and 3 SO<sub>2</sub>  
 MR 003 Blr 1, 2, and 3 CO<sub>2</sub>  
 MR 016 Blr 3 NO<sub>x</sub>  
 MR 019 Blr 3 O<sub>2</sub>  
 MR 022 Blr 3 Air Flow  
 MR 024 Boiler 3 CO  
 MR 025 Blr 3 Mercury  
 MR 027 Boiler 3 Opacity  
 SV 003

What to do	Why to do it								
EMISSION LIMITS	hdr								
Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input . This limit applies prior to modification of Boiler 3 and its pollution control stream.	Minn. R. 7011.0510, subp. 1								
Total Particulate Matter: less than or equal to 0.014 lbs/million Btu heat input for filterable PM. This limit applies upon return of Unit 3 to regular operation after modification of the boiler and its pollution control equipment stream.	Minn. R. 7007.0800, subp. 2								
Particulate Matter < 10 micron: less than or equal to 0.035 lbs/million Btu heat input filterable plus organic and inorganic condensibles. This limit applies upon return of Unit 3 to regular operation after modification of the boiler and its pollution control equipment stream.	Minn. R. 7007.0800, subp. 2								
Opacity: less than or equal to 20 percent opacity using 6-minute Average except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0510, subp. 2								
NO <sub>x</sub> Averaging Plan  Maintain an annual average NO <sub>x</sub> emission rate of 0.40 lbs/MMBtu and limit the annual heat input to less than or equal to 19,000,000 mmBtu per year.  OR  Maintain a Btu-weighted annual average emission rate in lbs/mmBtu, averaged over the units specified in the NO <sub>x</sub> averaging plan, that is less than or equal to the Btu-weighted annual average emission rate averaged over the same units had they each been operated during the same period of time in compliance with the applicable emission limitations in 40 CFR Sections 76.5, 76.6, or 76.7. Units covered in the plan are:  <table> <tr> <td>Plant</td><td>Boiler ID#</td></tr> <tr> <td>Clay Boswell</td><td>1, 2, 3, 4</td></tr> <tr> <td>Syl Laskin</td><td>1, 2</td></tr> <tr> <td>Taconite Harbor</td><td>1, 2, 3</td></tr> </table>	Plant	Boiler ID#	Clay Boswell	1, 2, 3, 4	Syl Laskin	1, 2	Taconite Harbor	1, 2, 3	40 CFR Section 76.8 Early election for Group 1, Phase II boilers and 40 CFR Section 76.5(a)(1) Minn. R. 7011.0553
Plant	Boiler ID#								
Clay Boswell	1, 2, 3, 4								
Syl Laskin	1, 2								
Taconite Harbor	1, 2, 3								
Nitrogen Oxides: less than or equal to 0.07 lbs/million Btu heat input based on a 30-day rolling average. This limit does not apply during times of startup, shutdown or malfunction.  This limit applies upon return of Unit 3 to regular operation after modification of the boiler and its pollution control equipment stream.	Minn. R. 7007.0800, subp. 2								
See GP004 for sulfur dioxide limits.	hdr								

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-17**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Hydrogen fluoride: less than or equal to 0.0018 lbs/million Btu heat input . This limit applies upon return of Unit 3 to regular operation after modification of the boiler and its pollution control equipment stream.	Title I Condition: to avoid major modification classification under 40 CFR Section 52.21 and Minn. R. 7007.3000
Carbon Monoxide: less than or equal to 0.15 lbs/million Btu heat input on a 24-hour rolling average. This limit does not apply during periods of startup, shutdown, or malfunction. This limit applies upon return of Unit 3 to regular operation after modification of the boiler and its pollution control equipment stream.	Title I Condition: 40 CFR Section 52.21 BACT limit
Lead: less than or equal to 0.00004 lbs/million Btu heat input . This limit applies upon return of Unit 3 to regular operation after modification of the boiler and its pollution control equipment stream.	Title I Condition: to avoid major modification classification under 40 CFR Section 52.21 and Minn. R. 7007.3000
<b>OPERATING REQUIREMENTS</b>	hdr
Regular operation for Unit 3 is defined as operation at more than 200 net MW of load for more than 7 days in a row after modification of the boiler and its pollution control equipment stream.	Minn. R. 7007.0800, subp. 2
Fuel use: limited to sub-bituminous coal, boiler cleaning agents, distillate oil, oily coal, used oil, wastewater treatment plant sludge, oily paper-based floor dry, and oily materials (includes mixtures of earth substrate (soil, rocks, sod, etc.) or man-made petroleum adsorption material and various petroleum derived fuels (hydraulic, transformer (less than 50 ppm PCB), crankcase or lubricating oils, diesel fuel, and crude oil)).  Note: the Permittee is prohibited from using oily materials or wastewater treatment plant sludge as fuel until the Permittee satisfactorily completes the performance testing requirements for these fuels under EU003.	Minn. R. 7007.0800, subp. 2
Boiler cleaning agents limited to: EDTA type and Ammonium Bromate, are generated on-site, 5% of total mass input, oxygen limited to 3% or greater, agents may only be burned while the boiler is operating at 75 percent of rated capacity or greater.	Minn. R. 7007.0800, subp. 2
Burn off-specification and on-specification used oil in accordance with Minn. R. ch. 7045, and not to exceed 2,456 gallons per hour.	Minn. R. 7007.0800, subp. 2
Vent all emissions to a scrubber for particulate control until the boiler and its pollution control equipment stream are modified. After return to regular operation vent all emissions to a selective catalytic reduction system, a fabric filter, and sulfur dioxide scrubber.	Minn. R. 7007.0800, subp. 2
<b>CONTINUOUS MONITORING</b>	hdr
Measure all Opacity, SO <sub>2</sub> , NO <sub>x</sub> , and CO <sub>2</sub> emissions from affected units in accordance with 40 CFR Section 75.10. See GP002 for requirements regarding opacity monitoring, and GP003 for requirements regarding SO <sub>2</sub> and NO <sub>x</sub> monitoring. The SO <sub>2</sub> and NO <sub>x</sub> monitors shall be capable of producing emission rates in units of lb/mmBtu on a one-hour average, a three-hour average and on a 30-day rolling average.  The opacity monitor shall be installed upon return of Unit 3 to regular operation as defined in this permit, and shall be located after the fabric filter and prior to the flue gas desulfurization unit.	40 CFR Section 75.10 Minn. R. 7017.1020 40 CFR Part 64
Install and operate a continuous emission monitor to measure all CO emissions. The monitor shall be capable of producing emission rates in units of lb/mmBtu on a 24 hour rolling average. See GP003 for requirements regarding CO monitoring.  The carbon monoxide monitor shall be installed upon return of Unit 3 to regular operation as defined in this permit.	Title I Condition: monitoring for BACT limit and Minn. R. 7007.0800, subp. 4
Operate and maintain the continuous opacity monitor as a partial indicator of compliance with the particulate matter limit after return to regular operation following modification of the boiler and its pollution control equipment stream.	40 CFR Part 64
Mercury Emissions Monitoring: Use a Hg CEMS to measure Hg emissions from EU 003 by July 1, 2007. Additional Hg monitoring requirements are located under subject item MR 025.	Minn. Statute 216B.681
Establish Baseline Mercury Emission Rate: Use mercury monitors to establish the baseline mercury emission rate for EU 003.  This is a state only requirement and is not enforceable by the EPA administrator and citizens under the Clean Air Act.	Minn. Stat. 216B.681
<b>PERFORMANCE TESTING</b>	hdr
Performance Test: due before 06/12/2007 to determine compliance with particulate matter emission limit in Minn. R. 7011.0510, subp 1.	Minn. R. 7017.2020, subp. 1 40 CFR Part 64
Initial Performance Test: due 180 days after achieving maximum capacity for PM and PM <sub>10</sub> after modification of Boiler 3 and its pollution control equipment stream.	Minn. R. 7017.2020, subp. 1 40 CFR Part 64

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-18**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Initial Performance Test: due 180 days after achieving maximum capacity for hydrogen fluoride after modification of Boiler 3 and its pollution control equipment stream.	Title I Condition: to avoid major modification classification under 40 CFR Section 52.21 and Minn. R. 7007.3000
Initial Performance Test: due 180 days after achieving maximum capacity for Lead after modification of Boiler 3 and its pollution control equipment stream.	Title I Condition: to avoid major modification classification under 40 CFR Section 52.21 and Minn. R. 7007.3000
<p>Boiler Alternative Operating Conditions for Performance Testing:</p> <p>Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing.</p> <p>In no case will the new operating rate limit be higher than allowed by an existing permit condition.</p>	Minn. R. 7017.2025, Subp. 2(A) and 3(B)
<p>Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing:</p> <p>If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited on an 8-hour block average based on the following:</p> <p>(1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate.</p> <p>(2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate.</p> <p>In no case will the new operating rate limit be higher than allowed by an existing permit condition.</p>	Minn. R. 7017.2025, Subp. 3(B)
<p>STET (Short Term Emergency and Testing) Operating hours limit:</p> <p>The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.</p>	Minn. R. 7007.0800, Subp. 2.
<p>STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing:</p> <p>If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average operating rate achieved during that performance test.</p> <p>If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test.</p> <p>In no case will STET operation be higher than allowed by an existing permit condition.</p>	Minn. R. 7007.0800, Subp. 2.
The results of a performance test are not final until issuance of a review letter by MPCA, unless specified otherwise by Minn. R. 7017.2001 - 7017.2060.	Minn. R. 7017.2020, Subp. 4.
Performance Test: due 30 days after Performance Test Notification (written) of intent to conduct a performance test while burning waste water sludge. The test shall be for determining compliance with the particulate matter emission limit in Minn. R. 7011.0510, subp. 1. The Permittee shall also concurrently measure CO emissions. Except for the purpose of conducting this performance test, the Permittee shall not use this material as a fuel until the Permittee receives notification from the agency that compliance was demonstrated during the Waste Water Sludge Performance Test.	Minn. R. 7017.2020, subp. 1.
Performance Test: due 30 days after Performance Test Notification (written) of intent to conduct a performance test while burning oily materials. The test shall be for determining compliance with the particulate matter emission limit in Minn. R. 7011.0510, subp. 1. The Permittee shall also concurrently measure CO emissions. Except for the purpose of conducting this performance test, the Permittee shall not use this material as a fuel until the Permittee receives notification from the agency that compliance was demonstrated during the Oily Materials Performance Test.	Minn. R. 7017.2020, subp. 1.



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-19**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Opacity monitoring alternative - monitor the following operating parameters for CE 003: 1) prequench slurry flow; 2) prequench slurry pressure; 3) high pressure slurry flow; 4) high pressure slurry pressure. (See requirements under CE 003).	Minn. R. 7007.0800, subp. 4
Compliance Assurance Monitoring Plan: Sixty days after return to regular operation as defined in this permit, submit a plan for developing opacity magnitude and duration levels to be used as triggers for fabric filter investigation. This plan will also identify specific investigation actions to be taken by plant personnel when the triggers are reached.  Submit trigger levels and related specific actions with 180 days after return to regular operation in the form of a major amendment application. Implement plan upon submittal. Terms identified in the permit application will be incorporated as permit conditions.	Minn. R. 7007.0800 , subp. 4 and 40 CFR Part 64
SUBMITTALS AND REPORTING	hdr
See Table B.	hdr

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-20**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 004 Power Boiler 4**Associated Items:** CE 004 Venturi Scrubber

CE 005 Electrostatic Precipitator - High Efficiency

CE 006 Spray Tower

CE 011 Fly Ash Injection

GP 004 Boilers 1-4 Sulfur Dioxide Limits

MR 005 Blr 4 Opacity

MR 006 Blr 4 CO2

MR 007 Blr 4 SO2

MR 008 Blr 4 NOx

MR 023 Blr 4 Air Flow

MR 026 Blr 4 Mercury

SV 004

What to do	Why to do it								
EMISSION LIMITS	hdr								
Total Particulate Matter: less than or equal to 0.1 lbs/million BTU heat input	Title I Condition: 40 CFR Section 52.21(j) PSD BACT limit and ambient impacts analysis; 40 CFR Section 60.42(a)(1)								
Opacity: less than or equal to 20 percent opacity based on a six minute average, except for one six-minute average per hour not to exceed 27%	40 CFR Section 60.42(a)(2) Minn. R. 7011.0555								
See GP004 for sulfur dioxide limits.	hdr								
Comply with the applicable Acid Rain emissions limitation for sulfur dioxide. Takes effect for years beginning January 1, 2000.	40 CFR Section 72.9(c)(1)(ii), 40 CFR Section 72.9(g)(4)								
Nitrogen Oxides: less than or equal to 0.7 lbs/million BTU heat input using 3 Hour Average for solid fossil fuels and less than 0.3 lb/mmBtu from liquid fossil fuels. When fossil fuels are burned simultaneously in any combination, the applicable standard shall be determined by proration using the following formula: $PS = [0.3y + 0.7z]/(y+z)$ where PS is the prorated NOx standard, y is the % heat input from liquid fossil fuels, and z is the % heat input from solid fossil fuels.	Title I Condition: 40 CFR Section 52.21(j) PSD BACT limit and ambient impacts analysis; 40 CFR Section 60.44								
NOx Averaging Plan  Maintain an annual average NOx emission rate of 0.40 lbs/MMBtu and limit the annual heat input to less than or equal to 33,000,000 mmBtu per year.  OR  Maintain a Btu-weighted annual average emission rate in lbs/mmBtu, averaged over the units specified in the NOx averaging plan, that is less than or equal to the Btu-weighted annual average emission rate averaged over the same units had they each been operated during the same period of time in compliance with the applicable emission limitations in 40 CFR Sections 76.5, 76.6, or 76.7. Units covered in the plan are:  <table> <tr> <td>Plant</td><td>Boiler ID#</td></tr> <tr> <td>Clay Boswell</td><td>1, 2, 3, 4</td></tr> <tr> <td>Syl Laskin</td><td>1, 2</td></tr> <tr> <td>Taconite Harbor</td><td>1, 2, 3</td></tr> </table>	Plant	Boiler ID#	Clay Boswell	1, 2, 3, 4	Syl Laskin	1, 2	Taconite Harbor	1, 2, 3	40 CFR Section 76.11 Minn. R. 7011.0553
Plant	Boiler ID#								
Clay Boswell	1, 2, 3, 4								
Syl Laskin	1, 2								
Taconite Harbor	1, 2, 3								
OPERATING REQUIREMENTS	hdr								
Fuel use: limited to sub-bituminous coal, boiler cleaning agents, distillate oil, oily coal, oily paper-based floor dry, and used oil.	Minn. R. 7007.0800, subp. 2								
Boiler cleaning agents limited to: EDTA type and Ammonium Bromate, are generated on-site, 5% of total mass input, oxygen limited to 3% or greater, agents may only be burned while the boiler is operating at 75 percent of rated capacity or greater.	Minn. R. 7007.0800, subp. 2								
Burn off-specification and on-specification used oil in accordance with Minn. R. ch. 7045, not to exceed 3824 gallons/hour (approximately 10 percent of rated capacity of 5,109 mmBtu/hour) on an hourly basis.	Minn. R. 7007.0800, subp. 2								

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-21**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Maintain SV 004 exit flue gas temperature at a minimum of 135 degrees F.	Minn. R. 7009
Vent all emissions to a venturi scrubber, electrostatic precipitator and spray tower.	Title I Condition: control of particulate matter and sulfur dioxide
PERFORMANCE TESTING	hdr
Performance Test: due before end of each 60 months following Initial Performance Test to determine compliance with the Title 1 condition particulate matter emission limit. The tests shall be conducted at an interval not to exceed 60 months between test dates.	Title I Condition: monitoring for the particulate emission limit set under 40 CFR Section 52.21; Minn. R. 7017.2020, subp. 1
Boiler Alternative Operating Conditions for Performance Testing:  Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing.  In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, Subp. 2(A) and 3(B)
Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing:  If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited on an 8-hour block average based on the following:  (1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate.  (2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate.  In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, Subp. 3(B)
STET (Short Term Emergency and Testing) Operating hours limit:  The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.	Minn. R. 7007.0800, Subp. 2.
STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing:  If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average operating rate achieved during that performance test.  If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test.  In no case will STET operation be higher than allowed by an existing permit condition.	Minn. R. 7007.0800, Subp. 2.
The results of a performance test are not final until issuance of a review letter by MPCA, unless specified otherwise by Minn. R. 7017.2001 - 7017.2060.	Minn. R. 7017.2020, Subp. 4.
CONTINUOUS MONITORING REQUIREMENTS	hdr
Measure all Opacity, SO <sub>2</sub> , NO <sub>x</sub> , and CO <sub>2</sub> emissions from affected units in accordance with 40 CFR Section 75.10. See GP002 for requirements regarding opacity monitoring, and GP003 for requirements regarding SO <sub>2</sub> and NO <sub>x</sub> monitoring. The SO <sub>2</sub> and NO <sub>x</sub> monitors shall be capable of producing emission rates in units of lb/mmBtu on a one-hour average, a three hour average and on a 30-day rolling average.  Using the 30-day averages for SO <sub>2</sub> , calculate and submit the annual SO <sub>2</sub> emission rate along with the annual compliance certification.	40 CFR Section 75.10 and Minn. R. 7017
Operate and maintain the continuous opacity monitor as a partial indicator of compliance with the particulate matter limit.	40 CFR Part 64

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-22**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Measure stack gas exit temperature.	Minn. R. 7009
Mercury Emissions Monitoring: Use a Hg CEMS to measure Hg emissions from EU 004 by July 1, 2007. Additional Hg monitoring requirements are located under subject item MR 026.	Minn. Stat. 216B.681
Establish Baseline Mercury Emission Rate: Use mercury monitors to establish the baseline mercury emission rate for EU 004.  This is a state only requirement and is not enforceable by the EPA administrator and citizens under the Clean Air Act.	Minn. Stat.216B.681
REPORTING	hdr
Submit the calculations and annual average emission rate of sulfur dioxide along with the annual compliance certification.	Minn. R. 7021.0050

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-23**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 007 Emergency Generator 1**Associated Items:** SV 007

What to do	Why to do it
Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
Fuel type: Diesel fuel oil or distillate fuel oil only	Minn. R. 7005.0100, subp. 35a
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of fuel oil, certifying that the sulfur content does not exceed 0.5% by weight.	Minn. R. 7007.0800, subps. 4 & 5

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-24**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 009 Emergency Generator 3**Associated Items:** SV 009 Diesel Emergency Generator 3

What to do	Why to do it
Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
Fuel type: Diesel fuel oil or distillate fuel oil only	Minn. R. 7005.0100, subp. 35a
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of fuel oil, certifying that the sulfur content does not exceed 0.5% by weight.	Minn. R. 7007.0800, subps. 4 & 5

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-25**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 010 Emergency Generator 4**Associated Items:** SV 010

What to do	Why to do it
Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
Fuel type: Diesel fuel oil or distillate fuel oil only	Minn. R. 7005.0100, subp. 35a
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of fuel oil, certifying that the sulfur content does not exceed 0.5% by weight.	Minn. R. 7007.0800, subps. 4 & 5

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-26**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 011 Coal Handling-Crusher Building**Associated Items:** CE 007 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
SV 011

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0715, subp. 1.A.
Opacity: less than or equal to 20 percent opacity	Minn. R. 7011.0715, subp. 1.B
Operate fabric filter when emissions from the equipment are vented to the atmosphere that meets the requirements of GP005.	Minn. Stat. Section 116.07, subd. 4(a); Minn. R. 7007.0800, subp. 2



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-27**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 012 Coal Handling-Crusher & Sampler House**Associated Items:** CE 008 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 012

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0715, subp. 1.A.
Opacity: less than or equal to 20 percent opacity	Minn. R. 7011.0715, subp. 1.B
Operate fabric filter when emissions from the equipment are vented to the atmosphere that meets the requirements of GP005.	Minn. Stat. Section 116.07, subd. 4(a); Minn. R. 7007.0800, subp. 2

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-28**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 013 Fly Ash - #1&2 Storage Silo**Associated Items:** CE 009 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
SV 013

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0715, subp. 1.A.
Opacity: less than or equal to 20 percent opacity	Minn. R. 7011.0715, subp. 1.B.
Operate fabric filter when emissions from the equipment are vented to the atmosphere that meets the requirements of GP005.	Minn. Stat. Section 116.07, subd. 4(a); Minn. R. 7007.0800, subp. 2

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-29**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 014 Fly Ash - #1&2 Ash Hoppers**Associated Items:** CE 010 Fabric Filter - Low Temperature, i.e., T<180 Degrees F  
SV 014

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0715, subp. 1.A.
Opacity: less than or equal to 20 percent opacity	Minn. R. 7011.0715, subp. 1.B.
Operate fabric filter when emissions from the equipment are vented to the atmosphere that meets the requirements of GP005.	Minn. Stat. Section 116.07, subd. 4(a); Minn. R. 7007.0800, subp. 2

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-30**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 015 Additive Handling and Storage**Associated Items:** CE 013 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 015 Additive Handling and Storage

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.01 grains/dry standard cubic foot unless required to further reduce emissions to comply with the less stringent of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Title I Condition: to avoid major modification classification under 40 CFR Section 52.21 and Minn. R. 7007.3000, also meets the requirements of Minn. R. 7011.0715
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, subp. 1.B
OPERATING CONDITIONS	hdr
Vent all emissions to a fabric filter that meets the requirements of GP005.	Title I Condition: to avoid major source classification under 40 CFR Section 52.21 and Minn. R. 7007.3000

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-31**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 016 Fly Ash Handling**Associated Items:** CE 014 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 016 Fly Ash Handling (separator)

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.01 grains/dry standard cubic foot unless required to further reduce emissions to comply with the less stringent of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Title I Condition: to limit potential emission increases to less than significant under 40 CFR 52.21 and Minn. R. 7007.3000, also meets the requirements of Minn. R. 7011.0715, 1.A
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, subp. 1.B
OPERATING CONDITIONS	hdr
Vent all emissions to a fabric filter that meets the requirements of GP005.	Title I Condition: to avoid major source classification under 40 CFR Section 52.21 and Minn. R. 7007.3000

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-32**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 017 Fly Ash Storage - Bin Vent**Associated Items:** CE 015 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 017 Fly Ash Storage-Bin Vent

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.005 grains/dry standard cubic foot unless required to further reduce emissions to comply with the less stringent of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Title I Condition: to limit potential emission increases to less than significant under 40 CFR 52.21 and Minn. R. 7007.3000, also meets the requirements of Minn. R. 7011.0715, 1.A
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, subp. 1.B
OPERATING CONDITIONS	hdr
Vent all emissions to a fabric filter that meets the requirements of GP005.	Title I Condition: to avoid major source classification under 40 CFR Section 52.21 and Minn. R. 7007.3000

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-33**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 018 Fly Ash Loadout**Associated Items:** SV 018 Fly Ash Loadout via general vent

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0715, 1.A
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, 1. B
OPERATING REQUIREMENTS	hdr
Add moisture to the flyash prior to loadout. Operation of the unit without moisture addition shall be a reportable deviation.	Minn. R. 7007.0800, subp. 2

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-34**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 019 Limestone Storage - Bin Vent**Associated Items:** CE 016 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 019 Limestone Storage - Bin Vent

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.005 grains/dry standard cubic foot unless required to further reduce emissions to comply with the less stringent of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Title I Condition: to limit potential emission increases to less than significant under 40 CFR 52.21 and Minn. R. 7007.3000, also meets the requirements of Minn. R. 7011.0715, 1. A
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, subp. 1.B
OPERATING CONDITIONS	hdr
Vent all emissions to a fabric filter that meets the requirements of GP005.	Title I Condition: to avoid major source classification under 40 CFR Section 52.21 and Minn. R. 7007.3000



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-35**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 020 Limestone Day Bin 1**Associated Items:** CE 017 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 020 Limestone Day Bin 1 - Bin Vent

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.005 grains/dry standard cubic foot unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Title I Condition: to limit potential emissions increases to less than significant under 40 CFR 52.21 and Minn. R. 7007.3000, also meets Minn. R. 7011.0715, 1.A
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, 1. B
OPERATING REQUIREMENTS	hdr
Vent all emissions to a fabric filter that meets the requirements of GP005.	Title I Condition: to avoid major source classification under 40 CFR Section 52.21 and Minn. R. 7007.3000

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-36**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 021 Limestone Day Bin 2**Associated Items:** CE 018 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 021 Limestone Day Bin 2 - Bin Vent

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.005 grains/dry standard cubic foot unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Title I Condition: to limit potential emission increases to less than significant under 40 CFR 52.21 and Minn. R. 7007.3000 , also meets Minn. R. 7011.0715, 1.A
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, 1. B
OPERATING REQUIREMENTS	hdr
Vent all emissions to a fabric filter that meets the requirements of GP005.	Title I Condition: to avoid major source classification under 40 CFR Section 52.21 and Minn. R. 7007.3000

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-37**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** EU 022 Emergency Gen. Unit 3 APCE**Associated Items:** SV 022 Emergency Generator - Unit 3

What to do	Why to do it
EMISSION LIMITS	hdr
Opacity: less than or equal to 20 percent once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Opacity: less than or equal to 20 percent during accelartion mode; 15 percent during lugging mode; and 50 percent during the peaks in either the acceleration or lugging modes.	40 CFR Section 60.4205(b)
Carbon Monoxide: less than or equal to 4.0 grams per kilowatt-hour.	Title I Condition: 40 CFR Section 52.21(j), BACT emission limit, also meets the requirements of 40 CFR Section 60.4202.
Non-methane Hydrocarbons plus Nitrogen Oxides: Less than or equal to 4.0 grams per kilowatt-hour	40 CFR Section 60.4205(b)
Total Particulate Matter: less than or equal to 0.30 grams per kilowatt-hour.	40 CFR Section 60.4205(b)
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input . Fuel with a sulfur content of 0.5 percent by weight or less meets this requirement.	Minn. R. 7011.2300, subp. 2
OPERATING REQUIREMENTS	hdr
Beginning October 1, 2007, use diesel fuel that meets the requirements of 40 CFR Section 80.510(a):  (1) Sulfur content. 500 parts per million (ppm) maximum.  (2) Cetane index or aromatic content, as follows:  (i) A minimum cetane index of 40; or  (ii) A maximum aromatic content of 35 volume percent.	40 CFR Section 60.4207(a)
Beginning October 1, 2010, use diesel fuel that meets the requirements of 40 CFR Section 80.510(b):  (1) Sulfur content.  (i) 15 ppm maximum for NR diesel fuel.  (ii) 500 ppm maximum for LM diesel fuel.  (2) Cetane index or aromatic content, as follows:  (i) A minimum cetane index of 40; or  (ii) A maximum aromatic content of 35 volume percent.	40 CFR Section 60.4207(b)
Owners and operators of pre-2011 model year stationary CI ICE subject to this subpart may petition the Administrator for approval to use remaining non-compliant fuel that does not meet the fuel requirements of paragraphs (a) and (b) of this section beyond the dates required for the purpose of using up existing fuel inventories. If approved, the petition will be valid for a period of up to 6 months. If additional time is needed, the owner or operator is required to submit a new petition to the Administrator.	40 CFR Section 60.4207(c)
Operate maintain the engine according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer. Only change those settings that are permitted by the manufacturer. You must also meet the requirments of 40 CFR parts 89, 94, and/ 1068 as they apply to you.	40 CFR Section 60.4211(a)
Meet the definition of "Emergency stationary internal combustion engine" - any stationary internal combustion engine whose operation is limited to emergency situations and required testing and maintenance. Examples include stationary ICE used to produce power for critical networks or equipment (including power supplied to portions of a faciltiy) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc. Stationary CI ICE used to supply power to an electric grid or that supply power as part of a financial arrangement with another entity are not considered to be emergency engines.	40 CFR Section 60.4219

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-38**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Operate the emergency engine for the purpose of maintenance checks and readiness testing provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor; or the insurance company associated with the engine. Maintenance checks and readiness testing for the emergency engine is limited to 100 hours per year. Anyone may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing. A petition is not required if the owner or operator maintains records indicating that the Federal State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year.	40 CFR Section 60.4211(e)
There is no time limit of the use of emergency stationary ICE in emergency situations. Any operation other than emergency operation, maintenance and testing, as permitted, is prohibited.	
After December 31, 2008, the permittee may not install a stationary CI ICE that does not meet the applicable requirements for 2007 model year engines.	40 CFR Section 60.4208(a)
MONITORING	hdr
Install a non-resettable hour meter prior to startup of the engine.	40 CFR Section 60.4209(a)
PERFORMANCE TESTING	hdr
If you conduct performance tests, the tests must be completed in accordance with 40 CFR 60.4212(a) through 40 CFR 60.4212(d).	40 CFR Section 60.4212
Performance Test: due 180 days after achieving maximum capacity for CO emissions.	Title I Condition: monitoring for CO BACT limit
COMPLIANCE DEMONSTRATION	hdr
Operate and maintain the unit in accordance with the standards as required by 40 CFR 60.4205, according to the manufacturer's written instructions, or according to the procedures developed by the owner or operator that are approved by the engine manufacturer, for the entire life of the engine. Settings for the unit may not be changed unless permitted by the manufacturer.	40 CFR Section 60.4206 and 40 CFR Section 60.4211(a)
The permittee must demonstrate compliance by purchasing an engine certified to conform with the emission standards listed in 40 CFR 52.05(b) for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.	40 CFR Section 60.4211(c)
Recordkeeping - Hours of operation: The permittee shall maintain documentation on-site that the unit is to be used for emergency (including training and testing) purposes, only that qualifies under the limitation above of 100 hours per year for checks and readiness testing. (40 CFR Section 60.4211(e)).	Minn. R. 7007.0800, subps. 4 and 5
Recordkeeping - Fuel Type: The permittee shall keep records of the type of fuel burned in this unit when in operation.	Minn. R. 7007.0800, subp. 4 and 5
The permittee shall maintain records of the operation of the engine in emergency service that is recorded through the non-resettable hour meter. The record must include the time of operation and the reason the generator was in operation during that time. This requirement is applicable when using a generator whose model year is 2012 or later, if the emergency engine also does not meet the standards for non-emergency engines for the 2012 model.	40 CFR Section 60.4214(b)
40 CFR Part 63, Subp. ZZZZ	hdr
Initial Notification: Submit an initial notification to the administrator as required by 40 CFR Section 63.9 within 120 days of initial startup. The initial notification shall include the following information:  (i) The name and address of the owner or operator;  (ii) The address (i.e., physical location) of the affected source;  (iii) An identification of the relevant standard, or other requirement, that is the basis of the notification and the source's compliance date;  (iv) A brief description of the nature, size, design, and method of operation of the source and an identification of the types of emission points within the affected source subject to the relevant standard and types of hazardous air pollutants emitted; and  (v) A statement of whether the affected source is a major source or an area source.	40 CFR Section 63.9(b)(2)
In addition, the notification shall contain a statement that your stationary RICE has not additional requirements and explain the basis of the exclusion of the unit from the requirements of 40 CFR Part 63, Subp. ZZZZ (for example, that it operates exclusively as an emergency/limited use stationary RICE or is less than 500 hp).	continued from above

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-39**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** CE 001 Fabric Filter - High Temperature, i.e., T>250 Degrees F**Associated Items:** EU 001 Power Boiler 1

What to do	Why to do it
The Permittee shall operate and maintain the control equipment such that it achieves an overall control efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Title I Condition and Minn. R. 7007.0800, subp. 2 and 14
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14
Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur:  - the recorded opacity is outside the permitted range; or - the fabric filter or any of its components are found during the inspections to need repair. Corrective actions shall return the opacity to within the permitted range, and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the fabric filter. The Permittee shall keep a record of the type and date of any corrective action taken for each filter.	Minn. R. 7007.0800, subp. 4, 5, and 14
COMPLIANCE ASSURANCE MONITORING	hdr
The owner or operator shall comply with the approved monitoring for opacity. The owner or operator shall measure the opacity by means of a COM.  Parameter range indicating normal operation is opacity as a six-minute average less than or equal to 20 percent opacity.	40 CFR Section 64.3(b) or (d) 40 CFR Section 64.6(c)(1)(i) 40 CFR Section 64.6(c)(1)(ii) Minn. R. 7017.0200
The owner or operator shall conduct the monitoring required under this part upon permit issuance.	40 CFR Section 64.7(a) Minn. R. 7017.0200
The owner or operator shall maintain the monitoring instruments and recorders, including but not limited to maintaining necessary parts for routine repairs of the monitoring equipment.	40 CFR Section 64.7(b) Minn. R. 7017.0200
Continuous Operation: Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities, the owner or operator shall conduct all monitoring in continuous operation at all times the pollutant-specific emissions unit is operating.	40 CFR Section 64.7(c) Minn. R. 7017.0200
Response to excursions or exceedances: Upon detecting an excursion or exceedance, the owner or operator shall restore operation of the pollutant-specific emissions unit to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.	40 CFR Section 64.7(d)(1) Minn. R. 7017.0200
Documentation of need for improved monitoring: After approval of monitoring under this part, if the owner or operator identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the owner or operator shall promptly notify the permitting authority and, if necessary, submit a proposed modification to the part 70 permit to address the necessary monitoring changes.	40 CFR Section 64.7(e) Minn. R. 7017.0200
The owner or operator shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained. The owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.	40 CFR Section 64.9(b) Minn. R. 7017.0200
The owner or operator shall report exceedances or excursions under 64.7 and 64.8 when the exceedance or excursion are greater than the limit and averaging period with the Semiannual Deviations Report.	40 CFR Section 64.9(a)(2)(i) Minn. R. 7017.0200

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-40**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** CE 002 Fabric Filter - High Temperature, i.e., T>250 Degrees F**Associated Items:** EU 002 Power Boiler 2

What to do	Why to do it
The Permittee shall operate and maintain the control equipment such that it achieves an overall control efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Title I Condition and Minn. R. 7007.0800, subp. 2 and 14
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14
Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur:  - the recorded opacity is outside the permitted operating range; or - the fabric filter or any of its components are found during the inspections to need repair. Corrective actions shall return the opacity to within the permitted range, and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the fabric filter. The Permittee shall keep a record of the type and date of any corrective action taken for each filter.	Minn. R. 7007.0800, subp. 4, 5, and 14
COMPLIANCE ASSURANCE MONITORING	hdr
The owner or operator shall comply with the approved monitoring for opacity. The owner or operator shall measure the opacity by means of a COM.  Parameter range indicating normal operation is opacity as a six-minute average less than or equal to 20 percent opacity.	40 CFR Section 64.3(b) or (d) 40 CFR Section 64.6(c)(1)(i) 40 CFR Section 64.6(c)(1)(ii) Minn. R. 7017.0200
The owner or operator shall conduct the monitoring required under this part upon permit issuance.	40 CFR Section 64.7(a) Minn. R. 7017.0200
The owner or operator shall maintain the monitoring instruments and recorders, including but not limited to maintaining necessary parts for routine repairs of the monitoring equipment.	40 CFR Section 64.7(b) Minn. R. 7017.0200
Continuous Operation: Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities, the owner or operator shall conduct all monitoring in continuous operation at all times the pollutant-specific emissions unit is operating.	40 CFR Section 64.7(c) Minn. R. 7017.0200
Response to excursions or exceedances: Upon detecting an excursion or exceedance, the owner or operator shall restore operation of the pollutant-specific emissions unit to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.	40 CFR Section 64.7(d)(1) Minn. R. 7017.0200
Documentation of need for improved monitoring: After approval of monitoring under this part, if the owner or operator identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the owner or operator shall promptly notify the permitting authority and, if necessary, submit a proposed modification to the part 70 permit to address the necessary monitoring changes.	40 CFR Section 64.7(e) Minn. R. 7017.0200
The owner or operator shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained. The owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.	40 CFR Section 64.9(b) Minn. R. 7017.0200
The owner or operator shall report exceedances or excursions under 64.7 and 64.8 when the exceedance or excursion are greater than the limit and averaging period with the Semiannual Deviations Report.	40 CFR Section 64.9(a)(2)(i) Minn. R. 7017.0200

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-41**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: CE 003 Alkaline Fly Ash Scrubbing**

What to do	Why to do it
Opacity monitoring alternative - monitor the following operating parameters for CE003: 1)prequench slurry flow; 2)prequench slurry pressure; 3)high pressure slurry flow; 4)high pressure slurry pressure.  These requirements apply until the modification of Boiler 3 and its pollution control equipment stream.	Minn. R. 7007.0800, subp. 4
Operate CE003 wet scrubber in accordance with the following operating parameters, in order to determine compliance with the opacity limit under Minn. R. 7011.0510, subp. 2: a. Prequench slurry flow >4592 gpm Prequench slurry pressure >32 psig b. High pressure slurry flow >4536 gpm High pressure slurry pressure >158 psig	Minn. R. 7007.0800, subp. 2
Record once each hour of operation of EU003 for CE003: 1)prequench slurry flow rate; 2)prequench slurry pressure; 3)high pressure slurry flow rate; 4)high pressure slurry pressure.	Minn. R. 7007.0800, subp. 5
COMPLIANCE ASSURANCE MONITORING	hdr
The owner or operator shall conduct the monitoring required under this part upon permit issuance.	40 CFR Section 64.7(a) Minn. R. 7017.0200
The owner or operator shall maintain the monitoring instruments and recorders, including but not limited to maintaining necessary parts for routine repairs of the monitoring equipment.	40 CFR Section 64.7(b) Minn. R. 7017.0200
Continuous Operation: Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities, the owner or operator shall conduct all monitoring in continuous operation at all times the pollutant-specific emissions unit is operating.	40 CFR Section 64.7(c) Minn. R. 7017.0200
Response to excursions or exceedances: Upon detecting an excursion or exceedance, the owner or operator shall restore operation of the pollutant-specific emissions unit to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.	40 CFR Section 64.7(d)(1) Minn. R. 7017.0200
Documentation of need for improved monitoring: After approval of monitoring under this part, if the owner or operator identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the owner or operator shall promptly notify the permitting authority and, if necessary, submit a proposed modification to the part 70 permit to address the necessary monitoring changes.	40 CFR Section 64.7(e) Minn. R. 7017.0200
The owner or operator shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained. The owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.	40 CFR Section 64.9(b) Minn. R. 7017.0200
The owner or operator shall report exceedances or excursions under 64.7 and 64.8 when the exceedance or excursion are greater than the limit and averaging period with the Semiannual Deviations Report.	40 CFR Section 64.9(a)(2)(i) Minn. R. 7017.0200

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-42**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** CE 004 Venturi Scrubber**Associated Items:** EU 004 Power Boiler 4

What to do	Why to do it
A minimum of one venturi slurry pump for each particulate scrubber module in service shall be operated at all times during the operation of EU004.	Title 1 Condition: monitoring for the particulate matter emission limit set under 40 CFR Section 52.21 and 40 CFR Section 60.42(a)(1)
COMPLIANCE ASSURANCE MONITORING	hdr
The owner or operator shall comply with the approved monitoring for opacity. The owner or operator shall measure the opacity by means of a COM.  Parameter range indicating normal operation is opacity as a six-minute average less than or equal to 20 percent opacity.	40 CFR Section 64.3(b) or (d) 40 CFR Section 64.6(c)(1)(i) 40 CFR Section 64.6(c)(1)(ii) Minn. R. 7017.0200
The owner or operator shall conduct the monitoring required under this part upon permit issuance.	40 CFR Section 64.7(a) Minn. R. 7017.0200
The owner or operator shall maintain the monitoring instruments and recorders, including but not limited to maintaining necessary parts for routine repairs of the monitoring equipment.	40 CFR Section 64.7(b) Minn. R. 7017.0200
Continuous Operation: Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities, the owner or operator shall conduct all monitoring in continuous operation at all times the pollutant-specific emissions unit is operating.	40 CFR Section 64.7(c) Minn. R. 7017.0200
Response to excursions or exceedances: Upon detecting an excursion or exceedance, the owner or operator shall restore operation of the pollutant-specific emissions unit to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.	40 CFR Section 64.7(d)(1) Minn. R. 7017.0200
Documentation of need for improved monitoring: After approval of monitoring under this part, if the owner or operator identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the owner or operator shall promptly notify the permitting authority and, if necessary, submit a proposed modification to the part 70 permit to address the necessary monitoring changes.	40 CFR Section 64.7(e) Minn. R. 7017.0200
The owner or operator shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained. The owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.	40 CFR Section 64.9(b) Minn. R. 7017.0200
The owner or operator shall report exceedances or excursions under 64.7 and 64.8 when the exceedance or excursion are greater than the limit and averaging period with the Semiannual Deviations Report.	40 CFR Section 64.9(a)(2)(i) Minn. R. 7017.0200



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-43**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: CE 005 Electrostatic Precipitator - High Efficiency****Associated Items: EU 004 Power Boiler 4**

What to do	Why to do it
<p>When bypass reheat is required to maintain compliance with the minimum flue gas exit temperature specified under SV004 in this permit, a portion of the total flue gas from EU004 may bypass the particulate matter emissions scrubber (CE004) and sulfur dioxide absorber (CE006), and be treated by a minimum of one unit of CE005 (electrostatic precipitator). When required to operate, CE005 shall not be operated with more than three of the bus-sections de-energized.</p> <p>When bypass reheat is not required to maintain compliance with the minimum flue gas exit temperature, all of the EU004 flue gas shall be treated by the particulate matter emissions scrubber (CE004) and sulfur dioxide absorber (CE006). After closing the inlet and outlet dampers to CE005, the Permittee may de-energize CE005.</p>	Title 1 Condition: To ensure compliance with the particulate matter emission limit set under 40 CFR Section 52.21 and 40 CFR Section 60.42(a)(1)
COMPLIANCE ASSURANCE MONITORING	hdr
<p>The owner or operator shall comply with the approved monitoring for opacity. The owner or operator shall measure the opacity by means of a COM.</p> <p>Parameter range indicating normal operation is opacity as a six-minute average less than or equal to 20 percent opacity</p>	<p>40 CFR Section 64.3(b) or (d)  40 CFR Section 64.6(c)(1)(i)  40 CFR Section 64.6(c)(1)(ii)  Minn. R. 7017.0200</p>
The owner or operator shall conduct the monitoring required under this part upon permit issuance.	40 CFR Section 64.7(a) Minn. R. 7017.0200
The owner or operator shall maintain the monitoring instruments and recorders, including but not limited to maintaining necessary parts for routine repairs of the monitoring equipment.	40 CFR Section 64.7(b) Minn. R. 7017.0200
Continuous Operation: Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities, the owner or operator shall conduct all monitoring in continuous operation at all times the pollutant-specific emissions unit is operating.	40 CFR Section 64.7(c) Minn. R. 7017.0200
Response to excursions or exceedances: Upon detecting an excursion or exceedance, the owner or operator shall restore operation of the pollutant-specific emissions unit to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.	40 CFR Section 64.7(d)(1) Minn. R. 7017.0200
Documentation of need for improved monitoring: After approval of monitoring under this part, if the owner or operator identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the owner or operator shall promptly notify the permitting authority and, if necessary, submit a proposed modification to the part 70 permit to address the necessary monitoring changes.	40 CFR Section 64.7(e) Minn. R. 7017.0200
The owner or operator shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained. The owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.	40 CFR Section 64.9(b) Minn. R. 7017.0200
The owner or operator shall report exceedances or excursions under 64.7 and 64.8 when the exceedance or excursion are greater than the limit and averaging period with the Semiannual Deviations Report.	40 CFR Section 64.9(a)(2)(i) Minn. R. 7017.0200

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-44**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** CE 021 Fabric Filter - High Temperature, i.e., T>250 Degrees F**Associated Items:** EU 003 Power Boiler 3

What to do	Why to do it
The Permittee shall operate and maintain the control equipment such that it achieves an overall control efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Minn. R. 7007.0800, subp. 2 and 14
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14
Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur:  - the recorded opacity is outside the permitted range; or - the fabric filter or any of its components are found during the inspections to need repair. Corrective actions shall return the opacity to within the permitted range, and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the fabric filter. The Permittee shall keep a record of the type and date of any corrective action taken for each filter.	Minn. R. 7007.0800, subp. 4, 5, and 14
COMPLIANCE ASSURANCE MONITORING	hdr
The owner or operator shall comply with the approved monitoring for opacity. The owner or operator shall measure the opacity by means of a COM.  Parameter range indicating normal operation is opacity as a six-minute average less than or equal to 20 percent opacity.  These requirements apply upon return of Unit 3 to regular operation.	40 CFR Section 64.3(b) or (d) 40 CFR Section 64.6(c)(1)(i) 40 CFR Section 64.6(c)(1)(ii) Minn. R. 7017.0200
An excursion or exceedance from the specified parameter range occurs when:  1. the measured pressure drop (observed once per operating day) deviates from the specified minimum or maximum by 0.1 inch WC or more.	40 CFR Section 64.6(c)(2)
The owner or operator shall conduct the monitoring required under this part upon permit issuance.	40 CFR Section 64.7(a) Minn. R. 7017.0200
The owner or operator shall maintain the monitoring instruments and recorders, including but not limited to maintaining necessary parts for routine repairs of the monitoring equipment.	40 CFR Section 64.7(b) Minn. R. 7017.0200
Continuous Operation: Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities, the owner or operator shall conduct all monitoring in continuous operation at all times the pollutant-specific emissions unit is operating.	40 CFR Section 64.7(c) Minn. R. 7017.0200
Response to excursions or exceedances: Upon detecting an excursion or exceedance, the owner or operator shall restore operation of the pollutant-specific emissions unit to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.	40 CFR Section 64.7(d)(1) Minn. R. 7017.0200
Documentation of need for improved monitoring: After approval of monitoring under this part, if the owner or operator identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the owner or operator shall promptly notify the permitting authority and, if necessary, submit a proposed modification to the part 70 permit to address the necessary monitoring changes.	40 CFR Section 64.7(e) Minn. R. 7017.0200
The owner or operator shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained. The owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.	40 CFR Section 64.9(b) Minn. R. 7017.0200
The owner or operator shall report exceedances or excursions under 64.7 and 64.8 when the exceedance or excursion are greater than the limit and averaging period with the Semiannual Deviations Report.	40 CFR Section 64.9(a)(2)(i) Minn. R. 7017.0200

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-45**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: FS 004 Unpaved Roads**

What to do	Why to do it
OPERATING CONDITIONS These requirements apply after 4/1/2007.	hdr
Fugitive Dust Control - EU003 dry fly ash haul roads:  - apply at least 3 gallons for each 100 square feet every 24 hours, - a rainfall of at least 0.1 inch during the previous 24 hours shall substitute for one water application, - if the road cannot be watered because the ambient air temperature is less than 35 degrees F or if conditions due to weather, in combination with the application of water, could create hazardous driving conditions, then watering shall be postponed and accomplished as soon as the conditions preventing water application have abated, - water application is not required on days when there is no vehicle traffic, and - following any day when water is not applied based on the absence of traffic, water shall be applied within 3 hours of commencement of vehicle traffic, unless another criterion for not watering is met.	Minn. R. 7011.0150
RECORDKEEPING	hdr
Maintain daily records of:  - whether there was 0.1 inch or more of rainfall in the last 24 hours, - temperature, - if conditions exist where watering would create hazardous driving, - dates of watering and areas watered, and - amounts of water applied.	Minn. R. 7007.0800, subp. 4

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-46**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item: FS 007 Paved Roads**

What to do	Why to do it
<b>OPERATING REQUIREMENTS</b> These requirements apply after 4/1/2007. Under dry pavement conditions, if the temperature is less than 35 degrees, or if conditions due to weather in combination with the application of water, could create hazardous driving conditions, paved plant roads shall be swept weekly. Sweeping is not required if the pavement is snow or ice covered. Under dry pavement conditions, if the temperature is greater than 35 degrees, and conditions due to weather in combination with the application of water will not create hazardous driving conditions, paved plant roads shall be swept and flushed weekly.	hdr  Title I Condition: to avoid major modification classification under 40 CFR Section 52.21 and Minn. R. 7007.3000
<b>RECORDKEEPING</b> Maintain daily records of: - whether and which areas are snow and ice covered, - whether and which areas are dry, - dates of sweeping and areas swept, - dates of flushing and areas flushed, and - amounts of water applied when flushing.	hdr  Minn. R. 7007.0800, subp. 4

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-47**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 002 Blr 1, 2, and 3 SO2**Associated Items:** EU 001 Power Boiler 1

EU 002 Power Boiler 2

EU 003 Power Boiler 3

GP 003 NOx, CO and SO2 Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar half-year following CEM Certification Test for MR 002, i.e., once every two successive QA operating quarters (calendar quarter in which there are at least 168 unit operating hours). Conduct a RATA on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, Appendix B. Relative accuracy test audits may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the conditions listed in 40 CFR pt. 75, Appendix B, Section 2.3.1.2(a) through Section 2.3.1.2(i) are met.	40 CFR pt. 75, Appendix B, Section 2.3.1, Minn. R. 7017.1020
Linearity and Leak Check Test (Acid Rain Program): due before end of each QA operating quarter (as defined in Section 72.) in accordance with procedures in 40 CFR pt. 75, Appendix B, Sections 2.2.1 and 2.2.2, and Appendix A, Section 6.2. Perform a leak check at least once during each QA operating quarter (calendar quarter in which there are at least 168 unit operating hours) and no less than 30 days apart.	40 CFR pt. 75, Appendix B, Section 2.2.1 & Section 2.2.2; Minn. R. 7017.1020

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-48**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 004 Blr 1 and 2 NOx**Associated Items:** EU 001 Power Boiler 1

EU 002 Power Boiler 2

GP 003 NOx, CO and SO2 Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar half-year following CEM Certification Test for MR004, i.e., once every two successive QA operating quarters (calendar quarter in which there are at least 168 unit operating hours). Conduct a RATA on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, Appendix B. Relative accuracy test audits may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the conditions listed in 40 CFR pt. 75, Appendix B, Section 2.3.1.2(a) through Section 2.3.1.2(i) are met.	40 CFR pt. 75, Appendix B, Section 2.3.1, Minn. R. 7017.1020
Linearity and Leak Check Test (Acid Rain Program): due before end of each QA operating quarter (as defined in Section 72.) in accordance with procedures in 40 CFR pt. 75, Appendix B, Sections 2.2.1 and 2.2.2, and Appendix A, Section 6.2. Perform a leak check at least once during each QA operating quarter (calendar quarter in which there are at least 168 unit operating hours) and no less than 30 days apart.	40 CFR pt. 75, Appendix B, Section 2.2.1 & Section 2.2.2; Minn. R. 7017.1020

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-49**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 005 Blr 4 Opacity**Associated Items:** EU 004 Power Boiler 4

GP 002 Opacity Monitors

What to do	Why to do it
CONTINUOUS OPACITY MONITORING SYSTEMS (COMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
COMS Calibration Error Audit: due before end of each calendar half-year following Permit Issuance for MR005. Conduct three point calibration error audits at least 3 months apart but no greater than 8 months apart. Conduct audits in accordance with Minn. R. 7017.1210, subp. 3.	Minn. R. 7017.1210, subp. 3

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-50**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 007 Blr 4 SO2**Associated Items:** EU 004 Power Boiler 4

GP 003 NOx, CO and SO2 Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar half-year following CEM Certification Test for MR007, i.e., once every two successive QA operating quarters (calendar quarter in which there are at least 168 unit operating hours). Conduct a RATA on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, Appendix B. Relative accuracy test audits may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the conditions listed in 40 CFR pt. 75, Appendix B, Section 2.3.1.2(a) through Section 2.3.1.2(i) are met.	40 CFR pt. 75, Appendix B, Section 2.3.1, Minn. R. 7017.1020
Linearity and Leak Check Test (Acid Rain Program): due before end of each QA operating quarter (as defined in Section 72.) in accordance with procedures in 40 CFR pt. 75, Appendix B, Sections 2.2.1 and 2.2.2, and Appendix A, Section 6.2. Perform a leak check at least once during each QA operating quarter (calendar quarter in which there are at least 168 unit operating hours) and no less than 30 days apart.	40 CFR pt. 75, Appendix B, Section 2.2.1 & Section 2.2.2; Minn. R. 7017.1020



**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-51

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 008 Blr 4 NOx**Associated Items:** EU 004 Power Boiler 4

GP 003 NOx, CO and SO2 Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar half-year following CEM Certification Test for Monitor 008, i.e., once every two successive QA operating quarters (calendar quarter in which there are at least 168 unit operating hours). Conduct a RATA on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, Appendix B. Relative accuracy test audits may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the conditions listed in 40 CFR pt. 75, Appendix B, Section 2.3.1.2(a) through Section 2.3.1.2(i) are met.	40 CFR pt. 75, Appendix B, Section 2.3.1, Minn. R. 7017.1020
Linearity and Leak Check Test (Acid Rain Program): due before end of each QA operating quarter (as defined in Section 72.) in accordance with procedures in 40 CFR pt. 75, Appendix B, Sections 2.2.1 and 2.2.2, and Appendix A, Section 6.2. Perform a leak check at least once during each QA operating quarter (calendar quarter in which there are at least 168 unit operating hours) and no less than 30 days apart.	40 CFR pt. 75, Appendix B, Section 2.2.1 & Section 2.2.2; Minn. R. 7017.1020

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-52**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 016 Blr 3 NOx**Associated Items:** EU 003 Power Boiler 3

GP 003 NOx, CO and SO2 Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar half-year following CEM Certification Test for MR016, i.e., once every two successive QA operating quarters (calendar quarter in which there are at least 168 unit operating hours). Conduct a RATA on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, Appendix B. Relative accuracy test audits may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the conditions listed in 40 CFR pt. 75, Appendix B, Section 2.3.1.2(a) through Section 2.3.1.2(i) are met.	40 CFR pt. 75, Appendix B, Section 2.3.1, Minn. R. 7017.1020
Linearity and Leak Check Test (Acid Rain Program): due before end of each QA operating quarter (as defined in Section 72.) in accordance with procedures in 40 CFR pt. 75, Appendix B, Sections 2.2.1 and 2.2.2, and Appendix A, Section 6.2. Perform a leak check at least once during each QA operating quarter (calendar quarter in which there are at least 168 unit operating hours) and no less than 30 days apart.	40 CFR pt. 75, Appendix B, Section 2.2.1 & Section 2.2.2; Minn. R. 7017.1020

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Minnesota Power Inc - Boswell Energy Ctr  
Permit Number: 06100004 - 003

Subject Item: MR 020 Blr 1 Opacity

Associated Items: EU 001 Power Boiler 1  
GP 002 Opacity Monitors

What to do	Why to do it
CONTINUOUS OPACITY MONITORING SYSTEMS (COMS) Requirements (Additional requirements are located under the associated GP subject item)	hdr
COMS Calibration Error Audit: due before end of each calendar half-year following Permit Issuance for MR020. Conduct three point calibration error audits at least 3 months apart but no greater than 8 months apart. Conduct audits in accordance with Minn. R. 7017.1210, subp. 3.	Minn. R. 7017.1210, subp. 3

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-54**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 021 Blr 2 Opacity**Associated Items:** EU 002 Power Boiler 2

GP 002 Opacity Monitors

What to do	Why to do it
CONTINUOUS OPACITY MONITORING SYSTEMS (COMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
COMS Calibration Error Audit: due before end of each calendar half-year following Permit Issuance for MR021. Conduct three point calibration error audits at least 3 months apart but no greater than 8 months apart. Conduct audits in accordance with Minn. R. 7017.1210, subp. 3.	Minn. R. 7017.1210, subp. 3

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-55

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 024 Boiler 3 CO**Associated Items:** EU 003 Power Boiler 3

GP 003 NOx, CO and SO2 Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test for MR024. A RATA is not required in any calendar year if a RATA conducted in the previous year demonstrated a relative accuracy value of less than 15 percent or if the associated emissions unit operated less than 48 hours during the calendar year. If the exception is used, the next RATA shall be conducted during the first half of the following calendar year. RATAs shall be conducted at least 3 months apart according to 40 CFR pt. 60, Appendix F, section 5.1.1.	Minn. R. 7017.1170, subp. 5

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-56**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 025 Blr 3 Mercury**Associated Items:** EU 003 Power Boiler 3

GP 006 Boilers 3 and 4 Mercury Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements: (Additional requirements are located under the Subject Item EU 003 and in Table B.)	hdr
Install: due before 07/01/2007 a mercury CEMS to monitor mercury emissions from EU 003.	Minn. Stat. 216B.681
CEM Certification Test: due 30 days after Excess Emissions/Downtime Reports (EER's) are first required for the CEMS. The first EER is due 30 days after the end of the calendar quarter following 07/01/2007. Follow the Certification Procedures in 40 CFR Section 75.80(d) or as approved by the MPCA.	Minn. R. 7017.1050, subp. 1; Minn. R. 7017.1110
CEMS QA/QC: The owner or operator shall meet the applicable QA/QC requirements in 40 CFR Section 75.80(e) or as approved by the MPCA.	Minn. Stat. 216B.681
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test A RATA is not required in any calendar year if a RATA conducted in the previous year demonstrated a relative accuracy value of less than 15 percent or if the associated emissions unit operated less than 48 hours during the calendar year. If the exception is used, the next RATA shall be conducted during the first half of the following calendar year. RATAs may be conducted using an alternate test method as approved by the MPCA.	40 CFR Section 75.80(e); Minn. R. 7017.1170, subp. 5
Recordkeeping and Recording: Follow the provisions listed under 40 CFR Section 75.84. This requirement is effective beginning January 1, 2009.	Minn. Stat. 216B.681

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-57**

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 026 Blr 4 Mercury**Associated Items:** EU 004 Power Boiler 4

GP 006 Boilers 3 and 4 Mercury Monitors

What to do	Why to do it
CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) Requirements (Additional requirements are found under the Subject Item EU 004 and in Table B)	hdr
Install: due before 07/01/2007 a mercury CEMS to monitor mercury emissions from EU 004.	Minn. Stat. 216B.681
CEM Certification Test: due 30 days after Excess Emissions/Downtime Reports (EER's) are first required for the CEMS. The first EER is due 30 days after the end of the calendar quarter following 07/01/2007. Follow the Certification Procedures in 40 CFR Section 75.80(d) or as approved by the MPCA.	Minn. R. 7017.1050, subp. 1; Minn. R. 7017.1110
CEMS QA/QC: The owner or operator shall meet the applicable QA/QC requirements in 40 CFR Section 75.80(e) or as approved by the MPCA.	Minn. Stat. 216B.681
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test A RATA is not required in any calendar year if a RATA conducted in the previous year demonstrated a relative accuracy value of less than 15 percent or if the associated emissions unit operated less than 48 hours during the calendar year. If the exception is used, the next RATA shall be conducted during the first half of the following calendar year. RATAs may be conducted using an alternative test method as approved by the MPCA.	40 CFR Section 75.80(e); Minn. R. 7017.1170, subp. 5
Recordkeeping and Recording: Follow the provisions listed under 40 CFR Section 75.84. This requirement is effective beginning January 1, 2009.	Minn. Stat. 216B.681

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-58

03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

**Subject Item:** MR 027 Boiler 3 Opacity**Associated Items:** EU 003 Power Boiler 3

GP 002 Opacity Monitors

What to do	Why to do it
CONTINUOUS OPACITY MONITORING SYSTEMS (COMS) Requirements (Additional requirements are located under the associated GP subject item and in Table B.)	hdr
COMS Calibration Error Audit: due before end of each calendar half-year following COMS Certification Test for MR027. Conduct three point calibration error audits at least 3 months apart but no greater than 8 months apart. Conduct audits in accordance with Minn. R. 7017.1210, subp. 3.	Minn. R. 7017.1210, subp. 3
REQUIREMENTS FOR INSTALLATION OF MR027, BOILER 3 FOR OPACITY.	hdr
Installation Notification: due 60 days before installing the continuous opacity monitoring system. The notification shall include plans and drawings of the system.	Minn. R. 7017.1040, subp. 1
COMS Certification Test Pretest Meeting: due 7 days before COMS Certification Test.	Minn. R. 7017.1060, subp. 3
COMS Certification Test: due 60 days after achieving maximum capacity.	Minn. R. 7017.1050, subp.1
COMS Certification Test Report: due 45 days after COMS Certification Test.	Minn. R. 7017.1080, subp. 1, 2 & 4
COMS Certification Test Report - Microfiche or CD Copy: due 105 days after COMS Certification Test.	Minn. R. 7017.1080, subp. 3



## TABLE B: SUBMITTALS

B-1 03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr  
Permit Number: 06100004 - 003

Also, where required by an applicable rule or permit condition, send to the Permit Technical Advisor notices of:

- accumulated insignificant activities,
- installation of control equipment,
- replacement of an emissions unit, and
- changes that contravene a permit term.

Send submittals that are required to be submitted to the U.S. EPA regional office to:

Mr. George Czerniak  
Air and Radiation Branch  
EPA Region V  
77 West Jackson Boulevard  
Chicago, Illinois 60604

Unless another person is identified in the applicable Table, send all other submittals to:

AQ Compliance Tracking Coordinator  
Industrial Division  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, Minnesota 55155-4194

Send submittals that are required by the Acid Rain Program to:

U.S. Environmental Protection Agency  
Clean Air Markets Division  
1200 Pennsylvania Avenue NW (6204N)  
Washington, D.C. 20460

Send any application for a permit or permit amendment to:

AQ Permit Technical Advisor  
Industrial Division  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, Minnesota 55155-4194

Each submittal must be postmarked or received by the date specified in the applicable Table. Those submittals required by parts 7007.0100 to 7007.1850 must be certified by a responsible official, defined in Minn. R. 7007.0100, subp. 21. Other submittals shall be certified as appropriate if certification is required by an applicable rule or permit condition.

Table B lists most of the submittals required by this permit. Please note that some submittal requirements may appear in Table A or, if applicable, within a compliance schedule located in Table C. Table B is divided into two sections in order to separately list one-time only and recurrent submittal requirements.

**TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS****B-2** 03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

What to send	When to send	Portion of Facility Affected
Application for Permit Reissuance	due 180 days before expiration of Existing Permit	Total Facility
Computer Dispersion Modeling Protocol	due 180 days after Permit Issuance for sulfur dioxide, PM10, and nitrogen oxides. This protocol will describe the proposed modeling methodology and input data, in accordance with MPCA modeling guidance for Title V air dispersion modeling analyses. This is a state-only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Total Facility
Computer Dispersion Modeling Results	due 180 days after receipt of written MPCA approval of modeling protocol for sulfur dioxide, nitrogen oxides and PM10. To be submitted after the MPCA has reviewed and approved the modeling protocol. The submittal should adhere to MPCA modeling guidance for Title V air dispersion modeling analyses. This is a state-only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Total Facility
COMS Certification Test Notification	due 30 days before COMS Certification Test for MR027, Boiler 3 Opacity.	MR027
Notification of the Actual Date of Initial Startup	due 15 days after Initial Startup after modification of Boiler 3 and its pollution control equipment stream.	EU003
Notification	due 60 days before 07/01/2007 for the installation of the Hg CEMS. The notification shall include plans and drawings of the proposed system which show the configuration of the monitoring system including any monitor bypass routes.	MR025, MR026
Plans and Specifications	due before 07/01/2011 for mercury removal. The plan shall contain the information specified in Minn. Stat. 216B.682, subd. 3.	EU004
Plans and Specifications	due before 12/31/2007 for mercury removal. The plan shall contain the information specified in Minn. Stat. 216B.682, subd. 3.	EU003
Relative Accuracy Test Audit (RATA) Notification	due 30 days before CEMS Relative Accuracy Test Audit (RATA)	MR025, MR026
Testing Frequency Plan	due 60 days after Initial Performance Test for Hydrogen Fluoride emissions.	EU003
Testing Frequency Plan	due 60 days after Initial Performance Test for Lead emissions.	EU003
Testing Frequency Plan	due 60 days after Initial Performance Test for PM and PM10 emissions.	EU003

**TABLE B: RECURRENT SUBMITTALS****B-3** 03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

What to send	When to send	Portion of Facility Affected
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (Submit Deviations Reporting Form DRF-1 as amended). The EER must contain all of the information requested in 40 CFR60.7(c). The EER shall indicate all periods of monitor bypass and all periods of exceedances of the limit including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions.	GP002, GP003
Linearity Test Results Summary	due 30 days after end of each calendar quarter following Linearity and Leak Check Test (Acid Rain Program), if performed.	MR002, MR004, MR007, MR008, MR016
Quarterly Report	due 30 days after end of each calendar quarter starting 01/01/2009 as referenced by 40 CFR Section 75.84(f).	MR026
Quarterly Report	due 30 days after end of each calendar quarter starting 01/01/2009 as required by 40 CFR Section 75.84(f).	MR025
Relative Accuracy Test Audit (RATA) Results Summary	due 30 days after end of each calendar quarter following CEMS Relative Accuracy Test Audit (RATA)	MR025, MR026
COMS Calibration Error Audit Results Summary	due 30 days after end of each calendar half-year following COMS Certification Test for MR027, Boiler 3 Opacity.	MR027
COMS Calibration Error Audit Results Summary	due 30 days after end of each calendar half-year following Permit Issuance for MR 005, Boiler 4 Opacity.	MR005
COMS Calibration Error Audit Results Summary	due 30 days after end of each calendar half-year following Permit Issuance for MR 020, Boiler 1 Opacity.	MR020
COMS Calibration Error Audit Results Summary	due 30 days after end of each calendar half-year following Permit Issuance for MR 021, Boiler 2 Opacity.	MR021
Relative Accuracy Test Audit (RATA) Results Summary	due 30 days after end of each calendar half-year following CEMS Relative Accuracy Test Audit (RATA) in which a CEMs RATA was conducted for MR002, Boiler 1 SO <sub>2</sub> .	MR002
Relative Accuracy Test Audit (RATA) Results Summary	due 30 days after end of each calendar half-year following CEMS Relative Accuracy Test Audit (RATA) in which the CEMs RATA was conducted for MR007, Boiler 4 SO <sub>2</sub> .	MR007
Relative Accuracy Test Audit (RATA) Results Summary	due 30 days after end of each calendar half-year following CEMS Relative Accuracy Test Audit (RATA) in which the CEMs RATA was conducted for MR008, Boiler 4 NO <sub>x</sub> .	MR008
Relative Accuracy Test Audit (RATA) Results Summary	due 30 days after end of each calendar half-year following CEMS Relative Accuracy Test Audit (RATA) in which the CEMs RATA was conducted for MR016, Boiler 3 NO <sub>x</sub> .	MR016
Relative Accuracy Test Audit (RATA) Results Summary	due 30 days after end of each calendar half-year following CEMS Relative Accuracy Test Audit (RATA) in which the CEMs RATA was conducted. for MR004, Boiler 1 NO <sub>x</sub> .	MR004
Semiannual Deviations Report	due 30 days after end of each calendar half-year following Permit Issuance. The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occurred, the Permittee shall submit the report stating no deviations.	Total Facility

**TABLE B: RECURRENT SUBMITTALS****B-4** 03/28/07

Facility Name: Minnesota Power Inc - Boswell Energy Ctr

Permit Number: 06100004 - 003

Compliance Certification	due 31 days after end of each calendar year following Permit Issuance (for the previous calendar year). To be submitted on a form approved by the Commissioner, both to the Commissioner and to the US EPA regional office in Chicago. This report covers all deviations experienced during the calendar year.	Total Facility
Relative Accuracy Test Audit (RATA) Results Summary	due 30 days after end of each calendar year following CEMS Relative Accuracy Test Audit (RATA) in which the CEMs RATA was conducted for MR024, Boiler 3 CO.	MR024

**APPENDIX MATERIAL**

**Facility Name: Minnesota Power - Boswell Energy Center**

**Permit Number: 06100004-003**

## Dispersion Modeling Parameters

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*** ISC3P - VERSION 99020 ***      *** 0959-03 MN Power - Boswell Energy Center - SO2 Modeling      ***      04/01/02
*** PRIME: Final, Scenario S01- Hibbing Met Year 1972      ***      15:35:23

C:\PROJECTS\MPBAPR02\PFS01_72.LST
**This Run Includes:      8 Source(s);      3 Source Group(s); and      6913 Receptor(s)
  AREA SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) XDIM(M) YDIM(M)
  VOLUME SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) SYI(M) SZI(M)
  AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) #VERTS. SZI(M)
  POINT SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) DIA(M) DIA(FT) DEG(K) DEG(C) DEG(F) VS(M/S) VS(F/M) ACFM
-----
POINT BEC_SV01 450572 5234323 395 0.00 0.00 0.00 76.20 250.00 2.900 9.514 439. 165. 330. 42.30 8326.77 592014
POINT BEC_SV04 450654 5234624 395 772.51 6131.0326852.45 182.88 600.00 6.100 20.013 343. 70. 158. 35.90 7066.93 2223054
POINT BEC_SV03 450543 5234355 395 2446.9019419.8485054.23 203.36 667.19 8.840 29.003 353. 79. 175. 15.60 3070.87 2028734
POINT BEC_SV09 450631 5234411 395 0.00 0.00 0.00 13.70 44.95 0.240 0.787 700. 427. 800. 20.20 3976.38 1936
POINT BEC_SV10 450683 5234586 395 0.02 0.20 0.86 8.20 26.90 0.640 2.100 700. 427. 800. 8.80 1732.28 5998
POINT BEDSV03S 450543 5234355 395 2446.9019419.8485054.23 213.30 699.80 8.840 29.003 353. 79. 175. 15.60 3070.87 2028734
POINT BECSV04A 450654 5234624 395 212.44 1686.03 7384.41 182.88 600.00 6.100 20.013 343. 70. 158. 35.90 7066.93 2223054
POINT BECSV09A 450631 5234411 395 0.00 0.00 0.00 13.70 44.95 0.240 0.787 700. 427. 800. 20.20 3976.38 1936
TOTAL 5878.7746656.94*****

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\*\*\* ISC3P - VERSION 99020 \*\*\*  
\*\*\* 0959-03: MN Power - Boswell Energy Center - NOx Modeling  
\*\*\* PRIME: Final Case , Scenario N01: Hibbing Met Year 1972

\*\*\* 04/02/02  
\*\*\* 08:10:19

C:\PROJECTS\MPBAPR02\PFN01\_72.LST

\*\*This Run Includes: 5 Source(s); 2 Source Group(s); and 6913 Receptor(s)  
AREA SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) XDIM(M) YDIM(M)  
VOLUME SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) SYI(M) SZI(M)  
AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) #VERTS. SZI(M)  
POINT SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) DIA(M) DIA(FT) DEG(K) DEG(C) DEG(F) VS(M/S) VS(F/M) ACFM  
POINT BEC\_SV04 450654 5234624 395 257.54 2043.97 8952.09 182.88 600.00 6.100 20.013 343. 70. 158. 35.90 7066.93 2223054  
POINT BEC\_SV03 450543 5234355 395 284.76 2260.00 9898.26 203.36 667.19 8.840 29.003 353. 79. 175. 15.60 3070.87 2028734  
POINT BEC\_SV10 450683 5234586 395 0.36 2.86 12.53 8.20 26.90 0.640 2.100 700. 427. 800. 8.80 1732.28 5998  
POINT BECSV03S 450543 5234355 395 284.76 2260.00 9898.26 213.30 699.80 8.840 29.003 353. 79. 175. 15.60 3070.87 2028734  
POINT BECSV09A 450631 5234411 395 0.00 0.02 0.10 13.72 45.01 0.240 0.787 700. 427. 800. 20.20 3976.38 1936  
TOTAL 827.42 6566.8528761.23

\*\*\* ISC3P - VERSION 99020 \*\*\*  
\*\*\* 0959-03 MN Power - Boswell Energy Center PM10 Modeling  
\*\*\* PRIME: Case PM10, Scenario P01 - Hibbing 1972

\*\*\* 04/05/02  
\*\*\* 20:20:22

C:\PROJECTS\MPBAPR02\PMP01\_72.LST

\*\*This Run Includes: 101 Source(s); 3 Source Group(s); and 6913 Receptor(s)  
AREA SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) XDIM(M) YDIM(M)  
VOLUME SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) SYI(M) SZI(M)  
AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) #VERTS. SZI(M)  
POINT SRCIDNT EASTINGNORTHING ELEV(M) G/SEC #/HOUR T/YEAR HGT(M) HGT(FT) DIA(M) DIA(FT) DEG(K) DEG(C) DEG(F) VS(M/S) VS(F/M) ACFM  
POINT BEC\_SV01 450572 5234323 395 0.00 0.00 0.00 76.20 250.00 2.900 9.514 439. 165. 330. 42.30 8326.77 592014  
POINT BEC\_SV04 450654 5234624 395 64.37 510.87 2237.50 182.88 600.00 6.100 20.013 343. 70. 158. 35.90 7066.93 2223054  
POINT BEC\_SV03 450543 5234355 395 272.50 2162.70 9472.10 203.36 667.19 8.840 29.003 353. 79. 175. 15.60 3070.87 2028734  
POINT BEC\_SV09 450631 5234411 395 0.00 0.03 0.12 13.70 44.95 0.240 0.787 700. 427. 800. 20.20 3976.38 1936  
POINT BEC\_SV10 450683 5234586 395 0.02 0.20 0.86 8.20 26.90 0.640 2.100 700. 427. 800. 8.80 1732.28 5998  
POINT BECSV03S 450543 5234355 395 272.50 2162.70 9472.10 213.30 699.80 8.840 29.003 353. 79. 175. 15.60 3070.87 2028734  
POINT BECSV09A 450631 5234411 395 0.00 0.00 0.01 13.70 44.95 0.240 0.787 700. 427. 800. 20.20 3976.38 1936  
POINT BEC\_SV11 450625 5234196 395 1.26 10.00 43.80 14.00 45.93 0.480 1.575 294. 21. 70. 41.50 8169.29 15912  
POINT BEC\_SV12 450570 5234161 395 0.68 5.41 23.70 30.48 100.00 0.360 1.181 294. 21. 70. 28.40 5590.55 6125  
POINT BEC\_SV14 450543 5234323 395 0.23 1.80 7.88 12.80 41.99 0.200 0.656 294. 21. 70. 2.90 570.87 193  
VOLUME BEC\_SV13 450540 5234289 395 0.00 0.01 0.05 29.00 95.14 0.390 15.000  
AREA BECFS101 450370 5234097 394 0.37 2.90 12.69 15.24 50.00 357.000 170.000 (0.6015E-05 G/S/M2, 60690.0 M2) \*HROFDY\*  
AREA BECFS301 450584 5234653 394 0.00 0.02 0.08 3.00 9.84 57.300 10.000 (0.3959E-05 G/S/M2, 573.0 M2)  
AREA BECFS302 450585 5234642 394 0.00 0.02 0.10 3.00 9.84 71.300 10.000 (0.3959E-05 G/S/M2, 713.0 M2)  
AREA BECFS303 450655 5234626 394 0.00 0.02 0.07 3.00 9.84 54.400 10.000 (0.3959E-05 G/S/M2, 544.0 M2)  
AREA BECFS304 450592 5234592 394 0.00 0.02 0.08 3.00 9.84 61.400 10.000 (0.3959E-05 G/S/M2, 614.0 M2)  
AREA BECFS305 450587 5234539 394 0.00 0.02 0.07 3.00 9.84 53.300 10.000 (0.3959E-05 G/S/M2, 533.0 M2)  
AREA BECFS306 450575 5234485 394 0.00 0.02 0.08 3.00 9.84 55.100 10.000 (0.3959E-05 G/S/M2, 551.0 M2)  
AREA BECFS307 450561 5234429 394 0.00 0.02 0.08 3.00 9.84 57.600 10.000 (0.3959E-05 G/S/M2, 576.0 M2)  
AREA BECFS308 450535 5234373 394 0.00 0.02 0.08 3.00 9.84 55.300 10.000 (0.3959E-05 G/S/M2, 553.0 M2)  
AREA BECFS309 450535 5234373 394 0.00 0.02 0.09 3.00 9.84 62.200 10.000 (0.3959E-05 G/S/M2, 622.0 M2)  
AREA BECFS310 450589 5234362 394 0.00 0.02 0.08 3.00 9.84 60.300 10.000 (0.3959E-05 G/S/M2, 603.0 M2)  
AREA BECFS311 450561 5234429 394 0.00 0.01 0.06 3.00 9.84 40.600 10.000 (0.3959E-05 G/S/M2, 406.0 M2)  
AREA BECFS312 450532 5234285 394 0.00 0.02 0.08 3.00 9.84 59.000 10.000 (0.3959E-05 G/S/M2, 590.0 M2)  
AREA BECFS313 450563 5234234 394 0.00 0.02 0.10 3.00 9.84 74.900 10.000 (0.3959E-05 G/S/M2, 749.0 M2)  
AREA BECFS314 450636 5234217 394 0.00 0.02 0.09 3.00 9.84 62.500 10.000 (0.3959E-05 G/S/M2, 625.0 M2)  
AREA BECFS315 450706 5234200 394 0.00 0.02 0.07 3.00 9.84 50.500 10.000 (0.3959E-05 G/S/M2, 505.0 M2)  
AREA BECFS316 450717 5234249 394 0.00 0.02 0.07 3.00 9.84 53.100 10.000 (0.3959E-05 G/S/M2, 531.0 M2)  
AREA BECFS317 450729 5234301 394 0.00 0.03 0.14 3.00 9.84 98.100 10.000 (0.3959E-05 G/S/M2, 981.0 M2)  
AREA BECFS318 450750 5234397 394 0.00 0.03 0.12 3.00 9.84 90.000 10.000 (0.3959E-05 G/S/M2, 900.0 M2)  
AREA BECFS319 450770 5234484 394 0.00 0.00 0.02 3.00 9.84 15.500 10.000 (0.3959E-05 G/S/M2, 155.0 M2)  
AREA BECFS320 450773 5234499 394 0.00 0.02 0.07 3.00 9.84 53.100 10.000 (0.3959E-05 G/S/M2, 531.0 M2)  
AREA BECFS321 450777 5234552 394 0.00 0.02 0.08 3.00 9.84 56.900 10.000 (0.3959E-05 G/S/M2, 569.0 M2)  
AREA BECFS322 450782 5234609 394 0.00 0.03 0.13 3.00 9.84 95.300 10.000 (0.3959E-05 G/S/M2, 953.0 M2)

AREA BECFS323	450702	5234591	394	0.02	0.12	0.53	3.00	9.84	45.700	83.800	(0.3959E-05	G/S/M2,	3829.7	M2)
AREA BECFS403	451302	5234229	394	0.04	0.28	1.22	3.00	9.84	100.000	10.000	(0.3507E-04	G/S/M2,	1000.0	M2)
AREA BECFS404	451207	5234252	394	0.03	0.27	1.19	3.00	9.84	97.400	10.000	(0.3507E-04	G/S/M2,	974.0	M2)
AREA BECFS405	451178	5234271	394	0.01	0.10	0.43	3.00	9.84	35.200	10.000	(0.3507E-04	G/S/M2,	352.0	M2)
AREA BECFS406	451104	5234323	394	0.03	0.25	1.11	3.00	9.84	91.000	10.000	(0.3507E-04	G/S/M2,	910.0	M2)
AREA BECFS407	451015	5234323	394	0.03	0.25	1.09	3.00	9.84	89.200	10.000	(0.3507E-04	G/S/M2,	892.0	M2)
AREA BECFS408	450922	5234324	394	0.03	0.26	1.13	3.00	9.84	92.300	10.000	(0.3507E-04	G/S/M2,	923.0	M2)
AREA BECFS409	450833	5234347	394	0.03	0.26	1.13	3.00	9.84	92.400	10.000	(0.3507E-04	G/S/M2,	924.0	M2)
AREA BECFS410	450748	5234368	394	0.03	0.24	1.07	3.00	9.84	87.800	10.000	(0.3507E-04	G/S/M2,	878.0	M2)
AREA BECFS411	450814	5234343	394	0.00	0.02	0.10	3.00	9.84	8.200	10.000	(0.3507E-04	G/S/M2,	82.0	M2)
AREA BECFS412	450802	5234339	394	0.00	0.03	0.11	3.00	9.84	10.000	9.000	(0.3507E-04	G/S/M2,	90.0	M2)
AREA BECFS413	450756	5234250	394	0.04	0.28	1.22	3.00	9.84	10.000	100.000	(0.3507E-04	G/S/M2,	1000.0	M2)
AREA BECFS414	450738	5234167	394	0.03	0.24	1.04	3.00	9.84	10.000	85.000	(0.3507E-04	G/S/M2,	850.0	M2)
AREA BECFS415	450738	5234167	394	0.02	0.19	0.84	3.00	9.84	69.200	10.000	(0.3507E-04	G/S/M2,	692.0	M2)
AREA BECFS416	450776	5234109	394	0.02	0.17	0.73	3.00	9.84	59.900	10.000	(0.3507E-04	G/S/M2,	599.0	M2)
AREA BECFS417	450805	5234057	394	0.02	0.18	0.81	3.00	9.84	66.400	10.000	(0.3507E-04	G/S/M2,	664.0	M2)
AREA BECFS418	450869	5234040	394	0.03	0.22	0.98	3.00	9.84	80.200	10.000	(0.3507E-04	G/S/M2,	802.0	M2)
AREA BECFS419	450938	5233999	394	0.03	0.23	1.00	3.00	9.84	82.300	10.000	(0.3507E-04	G/S/M2,	823.0	M2)
AREA BECFS420	451009	5233957	394	0.02	0.16	0.71	3.00	9.84	58.300	10.000	(0.3507E-04	G/S/M2,	583.0	M2)
AREA BECFS421	451054	5233920	394	0.02	0.17	0.75	3.00	9.84	61.300	10.000	(0.3507E-04	G/S/M2,	613.0	M2)
AREA BECFS422	451101	5233881	394	0.03	0.26	1.15	3.00	9.84	94.200	10.000	(0.3507E-04	G/S/M2,	942.0	M2)
AREA BECFS423	451141	5233796	394	0.03	0.21	0.94	3.00	9.84	76.800	10.000	(0.3507E-04	G/S/M2,	768.0	M2)
AREA BECFS424	451122	5233661	394	0.02	0.18	0.81	3.00	9.84	66.400	10.000	(0.3507E-04	G/S/M2,	664.0	M2)
AREA BECFS426	450957	5233600	394	0.03	0.24	1.06	3.00	9.84	87.300	10.000	(0.3507E-04	G/S/M2,	873.0	M2)
AREA BECFS425	451039	5233631	394	0.03	0.25	1.08	3.00	9.84	88.800	10.000	(0.3507E-04	G/S/M2,	888.0	M2)
AREA BECFS427	450873	5233603	394	0.03	0.23	1.02	3.00	9.84	83.600	10.000	(0.3507E-04	G/S/M2,	836.0	M2)
AREA BECFS428	450800	5233649	394	0.03	0.24	1.06	3.00	9.84	87.100	10.000	(0.3507E-04	G/S/M2,	871.0	M2)
AREA BECFS429	450765	5233693	394	0.02	0.16	0.68	3.00	9.84	56.100	10.000	(0.3507E-04	G/S/M2,	561.0	M2)
AREA BECFS430	450720	5233773	394	0.03	0.25	1.11	3.00	9.84	91.000	10.000	(0.3507E-04	G/S/M2,	910.0	M2)
AREA BECFS431	450677	5233850	394	0.03	0.25	1.08	3.00	9.84	89.000	10.000	(0.3507E-04	G/S/M2,	890.0	M2)
AREA BECFS432	450657	5233920	394	0.03	0.20	0.89	3.00	9.84	72.700	10.000	(0.3507E-04	G/S/M2,	727.0	M2)
AREA BECFS433	450678	5234018	394	0.04	0.28	1.22	3.00	9.84	10.000	100.000	(0.3507E-04	G/S/M2,	1000.0	M2)
AREA BECFS434	450694	5234045	394	0.03	0.21	0.94	3.00	9.84	76.800	10.000	(0.3507E-04	G/S/M2,	768.0	M2)
AREA BECFS435	450699	5234116	394	0.04	0.28	1.22	3.00	9.84	10.000	100.000	(0.3507E-04	G/S/M2,	1000.0	M2)
AREA BECFS436	450720	5234214	394	0.01	0.07	0.32	3.00	9.84	10.000	26.000	(0.3507E-04	G/S/M2,	260.0	M2)
AREA BECFS438	450678	5234018	394	0.04	0.28	1.22	3.00	9.84	100.000	10.000	(0.3507E-04	G/S/M2,	1000.0	M2)
AREA BECFS439	450766	5234072	394	0.01	0.07	0.33	3.00	9.84	26.900	10.000	(0.3507E-04	G/S/M2,	269.0	M2)
AREA BECFS437	450726	5234240	394	0.01	0.09	0.38	3.00	9.84	31.000	10.000	(0.3507E-04	G/S/M2,	310.0	M2)
AREA BECFS324	450564	5234707	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS325	450663	5234706	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS326	450762	5234701	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS327	450862	5234698	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS328	450962	5234698	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS329	451062	5234696	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS330	451161	5234695	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS331	451261	5234694	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS332	451361	5234692	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS333	451461	5234691	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05	G/S/M2,	1000.0	M2)
AREA BECFS334	451561	5234689	394	0.00	0.01	0.04	3.00	9.84	31.500	10.000	(0.3959E-05	G/S/M2,	315.0	M2)
AREA BECFS335	450357	5234718	394	0.00	0.00	0.01	3.00	9.84	100.000	10.000	(0.1852E-06	G/S/M2,	1000.0	M2)
AREA BECFS336	450457	5234712	394	0.00	0.00	0.00	3.00	9.84	49.300	10.000	(0.1852E-06	G/S/M2,	493.0	M2)
AREA BECFS337	450506	5234710	394	0.00	0.00	0.00	3.00	9.84	57.900	10.000	(0.1852E-06	G/S/M2,	579.0	M2)
AREA BECFS201	450370	5234097	394	0.43	3.42	15.00	15.24	50.00	357.000	170.000	(0.7110E-05	G/S/M2,	60690.0	M2)
AREA BECFS401	450370	5234097	394	0.09	0.68	2.99	15.24	50.00	357.000	170.000	(0.1417E-05	G/S/M2,	60690.0	M2)
AREA BECFS402	448555	5234852	396	0.08	0.60	2.63	3.00	9.841145.0001	400.800	(0.4711E-07	G/S/M2,	1603916.0	M2)	
AREA BECFS501	448583	5236107	394	0.24	1.88	8.24	0.00	0.00	631.800	415.400	(0.9036E-06	G/S/M2,	262449.7	M2)
AREA BECFS502	448575	5235859	394	0.15	1.20	5.24	0.00	0.00	820.000	203.600	(0.9036E-06	G/S/M2,	166952.0	M2)
AREA BECFS601	450719	5234006	394	1.22	9.71	42.55	21.20	69.55	450.000	170.000	(0.1600E-04	G/S/M2,	76500.0	M2)
AREA BECFS440	450357	5234718	394	0.00	0.00	0.00	3.00	9.84	47.400	10.000	(0.4711E-07	G/S/M2,	474.0	M2)
AREA BECFS441	450282	5234901	395	0.00	0.00	0.00	3.00	9.84	83.700	10.000	(0.4711E-07	G/S/M2,	837.0	M2)
AREA BECFS442	450317	5234814	396	0.00	0.00	0.00	3.00	9.84	94.200	10.000	(0.4711E-07	G/S/M2,	942.0	M2)
AREA BECFS443	450339	5234762	396	0.00	0.00	0.00	3.00	9.84	56.300	10.000	(0.4711E-07	G/S/M2,	563.0	M2)

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AREA BECFS444	449698	5234802	396	0.01	0.06	0.26	3.00	9.84	534.600	299.400	(0.4711E-07 G/S/M2,	160059.2 M2)
AREA BECFS338	451592	5234688	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05 G/S/M2,	1000.0 M2)
AREA BECFS339	451692	5234687	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05 G/S/M2,	1000.0 M2)
AREA BECFS340	451792	5234686	394	0.00	0.03	0.14	3.00	9.84	100.000	10.000	(0.3959E-05 G/S/M2,	1000.0 M2)
AREA BECFS341	451892	5234684	394	0.00	0.03	0.13	3.00	9.84	95.400	10.000	(0.3959E-05 G/S/M2,	954.0 M2)
TOTAL				613.95	4872.6521	341.03						
SUMP=				611.57	4853.7121	258.06						
SUMV=				0.00	0.01	0.05						
SUMA=				2.39	18.93	82.92						
WNDA=				0.82	6.50	28.49						

## Insignificant Activities

Activity	Rule Citation	Applicable Regulations
Grinders	Minn. R. 7007.1300, subp. 3.D.(2)	Minn. R. 7011.0715
Gasoline Tanks	Minn. R. 7007.1300, subp. 3.E(1)	NA
Welding Equipment	Minn. R. 7007.1300, subp. 3.H(4)	Minn. R. 7011.0715
Sandblasting	Minn. R. 7007.1300, subp. 4.B(2)	Minn. R. 7011.0715
Coal Stockpile loading	“	Minn. R. 7011.0150
Coal Stockpile, equipment traffic	“	Minn. R. 7011.0150
Conveyor drop onto stockpile, reclaimer	“	Minn. R. 7011.0150
Conveyor Drop onto Stockpile –Side Chute	“	Minn. R. 7011.0150
Rail Car Unloading	“	Minn. R. 7011.0150
Rail Car Load Out	“	Minn. R. 7011.0150
Lab Hoods (4)	“	Minn. R. 7011.0715
Coal Transfer Tower A	“	Minn. R. 7011.0150
Coal Transfer Tower B	“	Minn. R. 7011.0150
Coal Conveyer Belt C3	“	Minn. R. 7011.0150
Coal Rotary Car Dumper	“	Minn. R. 7011.0150
Coal Rotary Car TP	“	Minn. R. 7011.0150
Coal Transfer and Sampling House	“	Minn. R. 7011.0150
Coal Storage Silo	“	Minn. R. 7011.0715
Coal Tripper Transfer	“	Minn. R. 7011.0715
#4 Coal Bunker	“	Minn. R. 7011.0715

# Phase II NOx Compliance Plan

For more information, see instructions and refer to 40 CFR 76.9

This submission is:

☒

New

☐

Revised

<b>Step 1</b> Indicate plant name, State, and ORIS code from NADB, if applicable	Clay Boswell  Plant Name	MN  State	1893  ORIS Code
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**Step 2** Identify each affected Group 1 and Group 2 boiler using the boiler ID# from NADB, if applicable. Indicate boiler type: “CB” for cell burner, “CY” for cyclone, “DBW” for dry bottom wall-fired, “T” for tangentially fired, “V” for vertically fired, and “WB” for wet bottom. Indicate the compliance option selected for each unit

ID# 1	ID# 2	ID# 3	ID# 4	ID#	ID#
DBW	DBW	T	T		
Type	Type	Type	Type	Type	Type

(a) Standard annual average emission limitation of 0.50 lb/mmBtu (for <u>Phase I</u> dry bottom wall-fired boilers)						
(b) Standard annual average emission limitation of 0.45 lb/mmBtu (for <u>Phase I</u> tangentially fired boilers)			X			
(c) EPA-approved early election plan under 40 CFR 76.8 through 12/31/07 (also indicate above emission limit specified in plan)			X			
(d) Standard annual average emission limitation of 0.46 lb/mmBtu (for <u>Phase II</u> dry bottom wall-fired boilers)						
(e) Standard annual						

average emission limitation of 0.40 lb/mmBtu (for <u>Phase II</u> tangentially fired boilers)						
(f) Standard annual average emission limitation of 0.68 lb/mmBtu (for cell burner boilers)						
(g) Standard annual average emission limitation of 0.86 lb/mmBtu (for cyclone boilers)						
(h) Standard annual average emission limitation of 0.80 lb/mmBtu (for vertically fired boilers)						
(i) Standard annual average emission limitation of 0.84 lb/mmBtu (for wet bottom boilers)						
(j) NOx Averaging Plan (include NOx Averaging form)	X	X		X		
(k) Common stack pursuant to 40 CFR 75.17(a)(2)(i)(A) (check the standard emission limitation box above for most stringent limitation applicable to any unit utilizing stack)						
(l) Common stack pursuant to 40 CFR 75.17(a)(2)(i)(B) with NOx Averaging (check the NOx Averaging Plan box and include NOx Averaging form)	X	X				
(m) EPA-approved common stack apportionment method pursuant to 40 CFR 75.17 (a)(2)(i)(C), (a)(2)(iii)(B), or (b)(2)						
(n) AEL (include Phase II AEL Demonstration Period, Final AEL Petition, or AEL Renewal form as						

appropriate)						
(o) Petition for AEL demonstration period or final AEL under review by U.S. EPA or demonstration period ongoing						
(p) Repowering extension plan approved or under review						

### Standard Requirements

General. This source is subject to the standard requirements in 40 CFR 72.9 (consistent with 40 CFR 76.8(e)(1)(i)). These requirements are listed in this source's Acid Rain Permit.

#### Special Provisions for Early Election Units

Nitrogen Oxides. A unit that is governed by an approved early election plan shall be subject to an emissions limitation for NO<sub>x</sub> as provided under 40 CFR 76.8(a)(2) except as provided under 40 CFR 76.8(e)(3)(iii).

Liability. The owners and operators of a unit governed by an approved early election plan shall be liable for any violation of the plan or 40 CFR 76.8 at that unit. The owners and operators shall be liable, beginning January 1, 2000, for fulfilling the obligations specified in 40 CFR Part 77.

Termination. An approved early election plan shall be in effect only until the earlier of January 1, 2008 or January 1 of the calendar year for which a termination of the plan takes effect. If the designated representative of the unit under an approved early election plan fails to demonstrate compliance with the applicable emissions limitation under 40 CFR 76.5 for any year during the period beginning January 1 of the first year the early election takes effect and ending December 31, 2007, the permitting authority will terminate the plan. The termination will take effect beginning January 1 of the year after the year for which there is a failure to demonstrate compliance, and the designated representative may not submit a new early election plan. The designated representative of the unit under an approved early election plan may terminate the plan any year prior to 2008 but may not submit a new early election plan. In order to terminate the plan, the designated representative must submit a notice under 40 CFR 72.40(d) by January 1 of the year for which the termination is to take effect. If an early election plan is terminated any year prior to 2000, the unit shall meet, beginning January 1, 2000, the applicable emissions limitation for NO<sub>x</sub> for Phase II units with Group 1 boilers under 40 CFR 76.7. If an early election plan is terminated on or after 2000, the unit shall meet, beginning on the effective date of the termination, the applicable emissions limitation for NO<sub>x</sub> for Phase II units with Group 1 boilers under 40 CFR 76.7.

# Phase II NOx Averaging Plan

For more information, see instructions and refer to 40 CFR 76.11

This submission is:      New      ☐      ☒ Revised

## Step 1

Identify the units participating in this averaging plan by plant name, State, and boiler ID# from NADB. In column (a), fill in each unit's applicable emission limitation from 40 CFR 76.5, 76.6, or 76.7. In column (b), assign an alternative contemporaneous annual emissions limitation in lb/mmBtu to each unit. In column (c), assign an annual heat input limitation in mmBtu to each unit. Continue to page 3 if necessary.

Plant Name	State	ID#	(a) Emission Limitation	(b) Alt. Contemp. Emission Limitation	(c) Annual Heat Input Limit
Clay Boswell	MN	1	0.46	0.45	3,500,000
Clay Boswell	MN	2	0.46	0.45	3,500,000
Clay Boswell	MN	3	0.40	0.39	19,000,000
Clay Boswell	MN	4	0.40	0.35	33,000,000
Syl Laskin	MN	1	0.40	0.50	4,600,000
Syl Laskin	MN	2	0.40	0.50	4,600,000
Taconite Harbor	MN	1	0.40	0.45	5,600,000
Taconite Harbor	MN	2	0.40	0.45	5,600,000
Taconite Harbor	MN	3	0.40	0.45	5,600,000

## Step 2

Use the formula to enter the Btu-weighted annual emission rate averaged over the units if they are operated in accordance with the proposed averaging plan and the Btu-weighted annual average emission rate for the same units if they are operated in compliance with 40 CFR 76.5, 76.6, or 76.7.

The former must be less than or equal to the latter.

Btu-weighted annual emission rate averaged over the units if they are operated in accordance with the proposed averaging plan

Btu-weighted annual average emission rate for same units operated in compliance with 40 CFR 76.5, 76.6, or 76.7

0.40

0.40

$$\frac{\sum_{i=1}^n (R_{Li} \times HI_i)}{\sum_{i=1}^n HI_i} \leq \frac{\sum_{i=1}^n [R_{li} \times HI_i]}{\sum_{i=1}^n HI_i}$$

Where,

$R_{Li}$  = Alternative contemporaneous annual emission limitation unit i, in lb/mmBtu, as specified in column (b) of Step 1:

$R_{li}$  = Applicable emission limitation for unit i, in lb/mmBtu, as specified in column (a) of Step 1:

$HI_i$  = Annual heat input for unit i, in mmBtu, as specified in column (c) of Step 1:

$n$  = Number of units in the averaging plan

☒ This plan is effective for calendar year 2004 through calendar year 2007 unless notification to terminate the plan is given.

☐ Treat this plan as ☐ identical plans, each effective for one calendar year for the following calendar years           ,           ,           ,           , and            unless notification to terminate one or more of these plans is given.

#### Special Provisions

#### Emission Limitations

Each affected unit in an approved averaging plan is in compliance with the Acid Rain emission limitation for NO<sub>x</sub> under the plan only if the following requirements are met:

(i) For each unit, the unit's actual annual average emission rate for the calendar year, in lb/mmBtu, is less than or equal to its alternative contemporaneous annual emission limitation in the averaging plan, and

(a) For each unit with an alternative contemporaneous emission limitation less stringent than the applicable emission limitation in 40 CFR 76.5, 76.6, or 76.7, the actual annual heat input for the calendar year does not exceed the annual heat input limit in the averaging plan,

- (b) For each unit with an alternative contemporaneous emission limitation more stringent than the applicable emission limitation in 40 CFR 76.5, 76.6, or 76.7, the actual annual heat input for the calendar year is not less than the annual heat input limit in the averaging plan, or
- (ii) If one or more of the units does not meet the requirements of (i), the designated representative shall demonstrate, in accordance with 40 CFR 76.11(d)(1)(ii)(A) and (B), that the actual Btu-weighted annual average emission rate for the units in the plan is less than or equal to the Btu-weighted annual average rate for the same units had they each been operated, during the same period of time, in compliance with the applicable emission limitations in 40 CFR 76.5, 76.6, or 76.7.
- (iii) If there is a successful group showing of compliance under 40 CFR 76.11(d)(1)(ii)(A) and (B) for a calendar year, then all units in the averaging plan shall be deemed to be in compliance for that year with their alternative contemporaneous emission limitations and annual heat input limits under (i).

#### Liability

The owners and operators of a unit governed by an approved averaging plan shall be liable for any violation of the plan or this section at that unit or any other unit in the plan, including liability for fulfilling the obligations specified in part 77 of this chapter and sections 113 and 411 of the Act.

#### Termination

The designated representative may submit a notification to terminate an approved averaging plan, in accordance with 40 CFR 72.40(d), no later than October 1 of the calendar year for which the plan is to be terminated.



# Phase II Permit Application

For more information, see instructions and refer to 40 CFR 72.30 and 72.31

This submission is ☒ New ☐ Revised

Clay Boswell	MN	1893
Plant Name	State	ORIS Code

## Compliance Plan

a Boiler ID#	b Unit Will Hold Allowances in Accordance with 40 CFR 72.9(c)(1)	c Repowering Plan	d New Units Commence Operation Date	e New Units Monitor Certification Deadline
1	Yes	no		
2	Yes	no		
3	Yes	no		
4	Yes	no		
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			

## Standard Requirements

### Permit Requirements.

- (1) The designated representative of each affected source and each affected unit at the source shall:
- (i) Submit a complete Acid Rain permit application (including a compliance plan) under 40 CFR part 72 in accordance with the deadlines specified in 40 CFR 72.30; and

- (ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain permit application and issue or deny an Acid Rain permit;
- (2) The owners and operators of each affected source and each affected unit at the source shall:
  - (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and
  - (ii) Have an Acid Rain Permit.

#### Monitoring Requirements.

- (1) The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR parts 74, 75, and 76.
- (2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.
- (3) The requirements of 40 CFR parts 74 and 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

#### Sulfur Dioxide Requirements.

- (1) The owners and operators of each source and each affected unit at the source shall:
  - (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and
  - (ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.
- (2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.
- (3) An affected unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:
  - (i) Starting January 1, 2000, an affected unit under 40 CFR 72.6(a)(2); or
  - (ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an affected unit under 40 CFR 72.6(a)(3).
- (4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
- (5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1)(i) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
- (6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
- (7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

Nitrogen Oxides Requirements. The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

#### Excess Emissions Requirements.

- (1) The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
- (2) The owners and operators of an affected unit that has excess emissions in any calendar year shall:
  - (i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
  - (ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

#### Recordkeeping and Reporting Requirements.

- (1) Unless otherwise provided, the owners and operators of the source and each affected unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
  - (i) The certificate of representation for the designated representative for the source and each affected unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
  - (ii) All emissions monitoring information, in accordance with 40 CFR part 75;
  - (iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,
  - (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.

(2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

#### Liability.

(1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain permit application, an Acid Rain permit, or a written exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.

(2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.

(3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.

(4) Each affected source and each affected unit shall meet the requirements of the Acid Rain Program.

(5) Any provision of the Acid Rain Program that applies to an affected source (including a provision applicable to the designated representative of an affected source) shall also apply to the owners and operators of such source and of the affected units at the source.

(6) Any provision of the Acid Rain Program that applies to an affected unit (including a provision applicable to the designated representative of an affected unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans) and 40 CFR 76.11 (NO<sub>x</sub> averaging plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one affected unit shall not be liable for any violation by any other affected unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.

(7) Each violation of a provision of 40 CFR parts 72, 73, 74, 75, 76, 77, and 78 by an affected source or affected unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities. No provision of the Acid Rain Program, an Acid Rain permit application, an Acid Rain permit, or a written exemption under 40 CFR 72.7 or 72.8 shall be construed as:

(1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an affected source or affected unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;

(2) Limiting the number of allowances a unit can hold; provided, that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;

(3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;

(4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,

(5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

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**g**  
**TECHNICAL SUPPORT DOCUMENT**  
**For**  
**AIR EMISSION PERMIT NO. 06100004-003**  
**RE-ISSUANCE OF A PART 70 PERMIT**

This Technical Support Document (TSD) is intended for all parties interested in the permit and to meet the requirements that have been set forth by the federal and state regulations (40 CFR § 70.7(a)(5) and Minn. R. 7007.0850, subp. 1). The purpose of this document is to provide the legal and factual justification for each applicable requirement or policy decision considered in the preliminary determination to issue the permit.

## **1. General Information**

### **1.1. Applicant and Stationary Source Location:**

Applicant/Address	Stationary Source/Address (SIC Code: 4911)
Minnesota Power 30 West Superior Street Duluth, MN 55802-2093	1210 3 <sup>rd</sup> Street North Cohasset Itasca County
Contact: Brandon Krogh Phone: 218-723-3954	

### **1.2. Description of the Permit Action**

This permit action is a re-issuance of a Part 70 permit. Emission units at the Boswell Energy Center include four power boilers, emergency engine generators, and fuel, additive and ash handling equipment. The main fuel for all boilers is coal. They may also burn distillate oil, limited amounts of boiler cleaning agents, used oil, oily coal, oily paper-based floor dry, wastewater treatment plant sludge, and oily materials (earth substrate with petroleum product). Emissions are controlled by baghouses on Boilers 1 and 2, a wet scrubber on Boiler 3, and a wet venturi scrubber/electrostatic precipitator, and sulfur dioxide spray towers on Boiler 4.

### **1.3 Description of any Changes Allowed with this Permit Issuance**

This permit includes a major amendment to the facility's total facility operating air emission permit. It allows for a project to be conducted to comply with what Minnesota Power assumes will be the final outcome of U.S. Environmental Protection Agency's (EPA) Regional Haze Rule (RHR), Clean Air Interstate Rule (CAIR), Minnesota's Mercury Reduction Act (Act) and EPA's Clean Air Mercury Rule and any related Minnesota implementation procedures for these rules. Power boiler No. 3 will be retrofitted with Low Nitrogen Oxide (NO<sub>x</sub>) burners, over fire air and selective catalytic reduction for NO<sub>x</sub> control. It will be retrofitted with a baghouse filter for particulate and mercury control, and finally, with a wet scrubber for Sulfur Dioxide (SO<sub>2</sub>) control. Currently the only control equipment serving the boiler is a wet scrubber for particulate

emissions. Combustion controls will be installed and/or updated for Carbon Monoxide (CO) control.

The control equipment that Minnesota Power is proposing to install, along with proposed emissions limits are consistent with Federal New Source Review Best Available Control Technologies.

There will be new equipment installed for: delivery, storage and handling of mercury removal additive (if needed); ammonia for NO<sub>x</sub> control, limestone for SO<sub>2</sub> removal, and handling of dry fly ash from the fabric filter. There will also be a new emergency generator installed to allow for the orderly shutdown of the new pollution control equipment in the event of a power outage.

The project is subject to new source review for CO, the only pollutant that will increase according to the calculation methods for determining whether a modification results in a significant net emission increase for new source review applicability. There are limits on hydrogen fluoride and lead to prevent the modification from being classified as significant under new source review. For all other pollutants, emissions decrease.

#### **1.4 Description of All Amendments Issued Since the Issuance of the Last Total Facility Permit**

<b>Permit Number and Issuance Date</b>	<b>Action Authorized</b>
06100004-001 1997	Total Facility operating permit
06100004-002 1999	Major Amendment: The focus of the amendment was the addition of the NO <sub>x</sub> requirements to the Phase II Acid Rain portion of the Title V operating permit. A few administrative changes were made to the permit to bring it current with the latest rule changes.

#### **1.5. Facility Emissions:**

##### **Total Facility Potential to Emit Summary**

	PM tpy	PM <sub>10</sub> tpy	SO <sub>2</sub> tpy	NO <sub>x</sub> tpy	<sup>[4]</sup> CO tpy	VOC tpy	Single HAP tpy	All HAPs tpy
EU001 boiler	<b>328.5</b>	9	<b>13140</b>	<b>1623</b>	96.6	11.6	232	263
EU002 boiler	<b>328.5</b>	9	<b>13140</b>	<b>1623</b>	96.6	11.6	232	263
EU003 boiler pre-modification	<b>8817</b>	1469	<b>58780</b>	<b>5878</b>	<b>432</b>	51.9	1037	1177

EU003 boiler post-modification	<b>206</b>	<b>514</b>	<b>1322</b>	<b>1028</b>	2204	51.8	1037	1177
EU004 boiler	<b>2237.7</b>	60.8	<b>26853</b>	<b>15664</b>	658	79.0	1580	1793
EU007 IC engine	0.31	0.31	0.5	4.41	0.9	0.35		
EU009 IC engine	0.16	0.16	<b>0.25</b>	2.21	0.45	0.18		
EU010 IC engine	0.26	0.19	<b>1.88</b>	12.0	3.19	0.34		
EU011 coal	<b>0.51</b>	0.15						
EU012 coal	<b>0.51</b>	0.15						
EU013 fly ash	<b>0.74</b>	0.37						
EU014 fly ash	<b>0.74</b>	0.37						
EU015 Additive handling	<b>0.94</b>	0.94						
EU016 Ash handling	<b>1.50</b>	1.50						
EU017 Ash storage	<b>0.51</b>	0.51						
EU018 Ash truck loading	0.06	0.03						
EU019 Limestone silo	<b>0.38</b>	0.38						
EU020 Limestone day bin #1	<b>0.62</b>	0.62						
EU021 Limestone day bin #2	<b>0.62</b>	0.62						
EU022 IC engine	0.09	0.09	0.14	1.21	0.25	0.10		
FS001 coal pile	15.0	15.0						
FS002 bottom ash	0.0	0.0						
FS003 fly ash	5.25	5.25						
FS004 unpaved roads	27.7	7.78						
FS005 coal vehicles	48.7	10.3						

FS006 Coal stockpile material handling	1.27	0.60						
FS007 Paved roads	8.92	1.73						
FS008 Unit 3 flyash unloading into pond	0.07	0.04						
FS009 Unit 3 flyash pond wind erosion	1.0	1.0						

Boldface numbers are based on limits in the draft permit. Other table entries are from the MPCA permit database.

EU005 and EU006 are cooling towers. EU008 is an unused number.

(1) special SO<sub>2</sub> limits when EU001 and EU002 are not operating

(2) special SO<sub>2</sub> limit when EU001 and EU002 are not vented through SV001

(3) temperature requirement on SV004

(4) CO emissions pre-modification calculated as an average emission rate at full capacity. Potential emissions will be higher

	PM tpy	PM <sub>10</sub> tpy	SO <sub>2</sub> tpy	NO <sub>x</sub> tpy	CO tpy	VOC tpy	Single HAP tpy	All HAPs tpy
Total Facility Limited Potential Emissions pre modification	11,847	1602	111,915	24,808	1288	155	3080	3497
Total Facility Limited Potential Emissions post modification	3235	647	54,458	19,959	3060	155	3080	3497

### Facility Classification

Classification	Major/Affected Source	Synthetic Minor	Minor
PSD	X		
Part 70 Permit Program	X		
Part 63 NESHAP	X		

## 2. Regulatory and/or Statutory Basis

### New Source Review

The facility is an existing major source under New Source Review regulations. The Boswell Energy Center is in an attainment area for all pollutants, and so the applicable new source review regulations are found under 40 CFR § 52.21. Three of the facility's boilers (Nos. 1-3) existed prior to the effective dates of that program, and were not subject to it when installed. The installation of Power Boiler 4 was subject to new source review. The proposed modification to the pollution control equipment will result in an actual increase of CO emissions from Boiler #3. Because of the increase, the modification is subject to federal new source review for CO emissions. Accordingly, a Best Available Control Technology (BACT) analysis, as well as an Ambient Impacts Analysis was performed for CO. Combustion controls with an emission limit of 0.15 lb/mmBtu were determined to be BACT. The future potential minus past actual analysis is attached to this technical support document. The BACT Analysis is also attached.

A BACT analysis was also performed for NO<sub>x</sub>, Particulate Matter (PM), and SO<sub>2</sub>. Those analyses were performed voluntarily by Minnesota Power to demonstrate that the proposed control technology was consistent with BACT. The project is not formally subject to the regulation. Those analyses are attached.

### Part 70 Permit Program

The facility is a major source under the Part 70 permit program, and therefore must hold a Part 70 permit with a term of 5 years. This is a re-issuance of the Part 70 permit.

### New Source Performance Standards (NSPS)

Boiler 4 is subject to 40 CFR pt. 60, Subpart D. The proposed new emergency engine generator is subject to 40 CFR pt. 60, Subp. IIII.



### National Emission Standards for Hazardous Air Pollutants (NESHAP)

There are no NESHAPs for electric utility boilers. There is a NESHAP that applies to reciprocating internal combustion engines. The new emergency engine generator is exempted from the requirements of the standard, other than initial notification requirements in 40 CFR § 63.6600. Section 63.6600 exempts emergency/limited use engines, and engines that are smaller than 500 horsepower. The new proposed engine meets these two criteria. The other existing engines on site are exempt from the standard under the same criteria.

### Compliance Assurance Monitoring (CAM)

This permit action is a re-issuance of a Part 70 permit. Therefore CAM applies to any emission units with air pollution control equipment which meet the CAM applicability requirements. Boilers 1-4 use control equipment to meet particulate emission limits and the units are subject to CAM for particulate matter only. There are other emission limits and control equipment for some of the boilers but the boilers either do not use control equipment to meet those emission limits, or are monitored by continuous emission monitors, exempting those units for those pollutants for CAM. Therefore, CAM applies to emission unit 001 with a baghouse for PM control, emission unit 002 with a baghouse for PM control, emission unit EU003 with alkaline fly ash scrubbing currently and a fabric filter to be installed after permit issuance, and emission unit 004 with a venturi scrubber and electrostatic precipitator for PM control.

The CAM plans for the boilers are discussed in depth in part 3 of this technical support document.

### Minnesota State Rules

Portions of the facility are subject to the following Minnesota Standards of Performance:

- Minn. R. 7011.0510 Standards of Performance for Existing Indirect Heating Equipment
- Minn. R. 7011.0515 Standards of Performance for New Indirect Heating Equipment
- Minn. R. 7011.0710 Standards of Performance for Pre-1969 Industrial Process Equipment
- Minn. R. 7011.0715 Standards of Performance for Post-1969 Industrial Process Equipment
- Minn. R. 7011.2300 Standards of Performance for Stationary Internal Combustion Engines

### Mercury Reduction Act

In May of 2006, the State of Minnesota enacted the Mercury Emissions Reduction Act of 2006 (Minn. Stat. 216B.68 to 216B.687). The Act addresses several methods of reducing mercury emissions within the state, including reducing emissions from large electric power generating plants. Power plants that have a total net capacity in excess of 500 MW from all units at the site must develop plans and implement them at the units that are greater than 100 MW. A schedule is established in the Act that differs for dry and wet methods of controlling SO<sub>2</sub>. This legislation

affects the two larger units at the Boswell, Units 3 and 4. The Act will eventually require the reduction of mercury at targeted units. This permit includes the first of the requirements, the requirement to install a mercury emissions monitor on Units 3 and 4. Those monitors are due to be installed and operational by July 1, 2007.

This permit also addresses the requirement for wet and dry scrubbed units to prepare plans for achieving 90 percent reduction of mercury from the unit by 2014. Minn. Stat. 216B.6851, subd. 5 encourages early action for wet scrubbed units, and sets December 31, 2010 as the early action target date to achieve the 90 percent reduction for power boiler No. 3.

### Clean Air Interstate Rule

In March, 2005, the EPA promulgated the Clean Air Interstate Rule (CAIR) to address the interstate transport of air pollutants. This rule caps emissions of SO<sub>2</sub> and NO<sub>x</sub> in 28 eastern states, including Minnesota, and offers a NO<sub>x</sub> trading program to states. EPA estimates implementation of CAIR will result in \$85 to \$100 billion in health benefits and nearly \$2 billion in visibility benefits per year by 2015 and will substantially reduce premature mortality in the eastern United States. According to EPA, NO<sub>x</sub> reductions of 60 percent and SO<sub>2</sub> reductions of 30 percent will occur in Minnesota under the trading program.

Beginning in 2009, CAIR will cap emissions of NO<sub>x</sub> and will be followed by an SO<sub>2</sub> emission cap beginning in 2010. While most components of the trading program are fixed, states are free to determine the method of distributing budgeted NO<sub>x</sub> allowances to regulated parties. SO<sub>2</sub> allowances will continue to be allocated consistent with existing Acid Rain Program requirements.

The EPA adopted a Federal Implementation Plan (FIP), a default rule for implementing CAIR, in March 2006. CAIR allows states to make a few specific program changes under the FIP and put them in an “abbreviated” State Implementation Plan (SIP), which is due in March of 2007. The MPCA is considering implementation of CAIR through submittal of an abbreviated SIP. Whether the MPCA submits an abbreviated SIP or the FIP is the implementing rule for CAIR, units that are subject to CAIR will be required to comply beginning in 2009.

Minnesota has over 60 electric generating units greater than 25 MW that will be subject to the CAIR rule, including Minnesota Power’s Clay Boswell Unit 3. The owner or operator of each unit is able to choose from various compliance alternatives, including: installing pollution control equipment, switching fuels, buying excess allowances from other sources that have reduced their emissions, or transferring allowances between units with the same owner or operator. Because each source must hold sufficient allowances to cover its emissions each year, the limited number of allowances available ensures that required reductions are achieved in the 28 participating states as a whole.

Minnesota Power will use installation of pollution control equipment at Minnesota Power’s Boswell Unit 3 as part of its compliance strategy for CAIR. Since neither a CAIR FIP or an abbreviated SIP is expected to be in effect until fall of 2007, citation of the CAIR regulation is not included in this permit. Under either the FIP or abbreviated SIP, owners and operators of

CAIR units will be required to submit an application for a CAIR permit by July 2007. [ 40 CFR § 97.121] Under 40 CFR § 97.120, the CAIR permit will contain all applicable CAIR NOx Annual Trading Program and CAIR SO2 Program requirements and be a complete and separable portion of the title V operating permit. After the CAIR permit application is submitted to the MPCA, the CAIR program requirements and the CAIR permit will be added to the Minnesota Power's Boswell Energy Center's Title V permit in accordance with Minn. R. 7007.1600.

#### Regional Haze Rule (RHR)

To meet the Clean Air Act's requirements, the EPA published regulations to address visibility impairment in our nation's largest national parks and wilderness ("Class I") areas in July 1999. This rule is commonly known as the "Regional Haze Rule" [64 Fed. Reg. 35714 (July, 1999)] and is found in 40 CFR part 51, in §§ 51.300 through 51.309.

Within its boundary, Minnesota has two Class I areas – the Boundary Waters Canoe Area Wilderness and Voyageurs National Park. In addition, emissions from Minnesota may contribute to visibility impairment in other states' Class I areas, such as Michigan's Isle Royale National Park and Seney Wilderness Area. By December 2007, Minnesota must submit to EPA a Regional Haze State Implementation Plan (SIP) that identifies sources that cause or contribute to visibility impairment in these areas. The Regional Haze SIP must also include a demonstration of reasonable progress toward reaching the 2018 visibility goal for each of the state's Class I areas.

The EPA's 1999 Regional Haze Rule singles out certain older emission sources that have not been regulated under other provisions of the Clean Air Act. Those older sources that could contribute to visibility impairment in Class I areas may be required to install Best Available Retrofit Technology (BART). Minnesota Power's Clay Boswell Unit 3 is one such source and was designated by the MPCA as "BART-eligible". [See this website for more information on the MPCA's implementation of BART: <http://www.pca.state.mn.us/air/regionalhaze.html>.] On July 6, 2005, EPA published a revised final rule, including Appendix Y to 40 CFR part 51 "Guidelines for BART Determinations Under the Regional Haze Rule" that provides direction to states on determining which of these older sources may need to install BART and how to determine BART.

EPA has found that, as a whole, CAIR improves visibility more than implementing BART for EGUs in states affected by CAIR. If CAIR is determined by the state to substitute for BART, then BART-eligible EGU's are not required to install, operate and maintain BART. 40 CFR § 51.308 (e)(4) states:

"A State that opts to participate in the Clean Air Interstate Rule cap-and-trade program under part 96 AAA-EEE need not require affected BART-eligible EGU's to install, operate, and maintain BART. A State that chooses this option may also include provisions for geographic enhancement to this program to address the requirement under § 51.302 (c) related to BART for reasonably attributable impairment from the pollutants covered by the CAIR cap-and-trade program."

As described in the "MPCA Response To Comments On Proposed BART Strategy For Minnesota" dated December 15, 2005, the MPCA decided to determine whether CAIR

substitutes for BART within about three months after BART analyses are due (fall 2006). The MPCA still expects to make the decision as to whether CAIR substitutes for BART by fall of 2007. Minnesota Power was not requested to submit a BART analysis for Clay Boswell Unit 3 since they have committed to installing the most stringent control available for the targeted visibility pollutants (particulate matter, SO<sub>2</sub>, and NO<sub>x</sub>). BACT is an analysis required under the federal New Source Review program. The MPCA has determined that an analysis that meets the requirements of a BACT determination would also satisfy BART requirements. The components of the analyses are similar.

The MPCA accepts Minnesota Power's analysis, proposed control technology, and emission limits as being consistent with BACT. The MPCA believes that the PM<sub>10</sub> limit being established in this permit action is potentially a conservative limit. The MPCA has previously issued a permit retrofitting NO<sub>x</sub> and SO<sub>2</sub> controls at Xcel's AS King electric generating unit in Oak Park Heights, Minnesota establishing a PM<sub>10</sub> limit for that facility of 0.030 lb/mmbtu, while Ottertail Power's Big Stone II project proposes to construct a new PC boilers with SCR, FF and FGD to achieve a PM<sub>10</sub> limit of 0.030 lb/mmbtu. Minnesota Power has expressed some uncertainty surrounding the ability of the pollution control system to absorb any SO<sub>3</sub> that might be generated in the SCR, and then expressed as PM<sub>10</sub> during stack testing. Rather than establishing the lower PM<sub>10</sub> limit in this permit action, at the time of permit reissuance, the MPCA will review performance testing of Boswell 3 to determine if the unit is capable of achieving a PM<sub>10</sub> limit of 0.030 lb/mmbtu.

Because the Regional Haze SIP for the State of Minnesota with its plan for BART implementation has not been approved by EPA, this permit sets emission limits and cites its general environmental protection authority, Minn. R. 7007.0800, subp. 2, as the basis for the emission limits. However, the MPCA expects to include in its regional haze SIP a schedule for updating its Title V permits for facilities with BART units, including Clay Boswell, to add the appropriate citations for the visibility regulations upon EPA approval of the Minnesota regional haze SIP.

In order to achieve reasonable progress toward the 2018 visibility goal, Minnesota may need to implement control measures on other sources in addition to BART. BART applies to a relatively small subset of Minnesota sources. Additional reductions may also be required in nearby states that contribute to visibility impairment in Minnesota's Class I areas. However, the substantial emissions reductions resulting from the new controls at Clay Boswell Unit 3 will help in making progress towards the 2018 uniform reasonable progress goals for Minnesota's Class I areas.

#### Clean Air Mercury Rule

In May 2005 EPA promulgated the Clean Air Mercury Rule, a cap and trade program for mercury emissions from coal-fired electric generating utilities. Because all generating units at Boswell are greater than 25 MW, all four units are subject to the requirements of CAMR.

CAMR requires that Minnesota Power hold mercury emission allowances equal to the mass of mercury emitted in each year, starting the first year 2010. CAMR requires that each unit be

subject to mercury monitoring. CAMR provides for a “low-emitting” exemption from continuous mercury monitors if the unit emits less than 29 pounds per year. Minnesota Power may pursue the exemption for units 1 and 2 because the units’ emissions meet the exemption threshold. (40 CFR 75.81(b)) Conditions have been included in this permit for Units 1 and 2 to require the installation of monitors as allowed by EPA. Because Units 3 and 4 will have mercury monitors installed and operating by July 2007 to meet the requirements of Minn. Stat. 216B.681, operating, certification and reporting requirements related to the mercury monitors are included with this permit.

### Environmental Review

The rules of the state Environmental Quality Board (EQB) specify which projects require an environmental review. Those requirements are contained in Minn. R. 4410.0200-.9910. The state administers the requirements.

There are two levels of review – Environmental Impact Statement (EIS) and Environmental Assessment Worksheet (EAW). An EIS is a detailed analysis of a project. An EAW is a general review of the potential impacts of a project.

The project does not fall under a type that requires a mandatory EIS. The project could potentially be required to an EAW assessment if potential emissions increase more than 250 tons per year, (Minn. R. 4410.4300, subp. 15.A.)

Minnesota Power has completed an analysis of potential emission increases according to MPCA policy and EQB rules and determined that there will not be an increase in potential emissions of 250 tons per year of any pollutant. This analysis is performed differently under EQB rules than under federal new source review regulations so the determination that there would be a CO increase under new source review regulations does not ensure that there is an increase under the different calculation method specified by EQB rules.

The potential emissions increase using the EQB rules and MPCA policy is a comparison of potential to potential emissions, and is as follows:

<b>Pollutant</b>	<b>Future Potential less Past Potential (tpy)</b>
NO <sub>x</sub>	-4,848
PM	-8,592
PM <sub>10</sub>	-946
SO <sub>2</sub>	-57,457
Sulfuric Acid	-1,320

CO is a little more difficult to quantify. Minnesota Power has proposed 24 hour limit on CO emissions of 0.15 lb/mmBtu. There is no existing limit on CO emissions. Past operating history shows emissions that exceeded the proposed limit, as determined by continuous emission monitors. In fact, over 17 percent of the time, emissions exceeded this level. Since the unit could have been operated with emissions at this higher level, it is determined that there is not an increase in potential CO emissions. A detailed discussion is in the appendices to this technical support document.

### Regulatory Overview of Facility

EU, GP, or SV	Applicable Regulations	Comments:
GP004	Minn. R. ch. 7009, Minn. R. 7011.0515	SO2 limits are grouped because the boilers are all subject to both the SO2 limits set by Minnesota Performance Standards, and by SO2 limits established by air quality analyses performed to ensure that ambient standards for SO2 are not violated. Some of the limits assigned to a boiler are dependent on the operation of the other boilers.
EU004 Boiler 4	Minn. R. ch. 7009	Minimum exit gas temperature for SV004 Requirements on venturi scrubber and electrostatic precipitator operation and monitoring are included for Power Boiler 4. The requirements are based on maintaining a minimum SV 004 gas exit temperature by diverting a portion of the exhaust gases around the scrubber directly to the ESP, to avoid exhaust gas cooling due to the scrubber. This diverted flue gas acts to reheat the scrubber flue gas. This minimum temperature requirement is necessary to ensure adequate emissions dispersion.
EU 001 Boiler 1	40 CFR § 52.21	Title I Condition: PM limit based on PSD modeling for installation of EU004
	Minn. R. 7011.0510, subp. 2	Opacity limit
	Minn. R. ch. 7011.0510, subp. 1 and Minn. R. ch. 7009	SO2 limits
	40 CFR pt. 72 and pt. 76 Federal Acid Rain regulations	SO2 allowances and NOx limits and averaging plan
	Minn. R. ch. 7007.0800, subp. 2	Specification of types of fuels and wastes allowed to be burned
EU 002	40 CFR § 52.21	Title I Condition: PM limit based on PSD modeling for installation of EU004
	Minn. R. 7011.0510, subp. 2	Opacity limit

	Minn. R. 7011.0510, subp. 1 and Minn. R. ch. 7009	SO2 limits
	40 CFR pt. 72 and pt. 76 Federal Acid Rain regulations	SO2 allowances and NOx limits and averaging plan
	Minn. R. ch. 7007.0800, subp. 2	Specification of types of fuels and wastes allowed to be burned
EU 003	Minn. R. 7011.0510, subp. 1	PM limit
	Minn. R. 7011.0510, subp. 2	Opacity limit
	Minn. R. 7011.0510, subp. 1	SO2 limit for solid and liquid fuels and proportional equation for use of both fuels
	Minn. R. ch. 7009	1-hr average SO2 limit based on modeling
	40 CFR pt. 76	NOx limit for federal acid rain regulations
	Minn. R. 7007.0800	Fuel type limits
	Minn. R. 7007.0800, subp. 2	PM, PM10, NOx, and SO2 limits based on BACT analysis performed to comply with BART regulations not yet promulgated. These limits apply after modification of Boiler 3 and its pollution control equipment stream
	Title I Condition: to avoid major modification classification under 40 CFR Section 52.21	Hydrogen Fluoride and Lead limits. These limits apply after modification of Boiler 3 and its pollution control equipment stream.
	40 CFR Section 52.21	PSD BACT limit for CO. Applies after modification of Boiler 3 and its pollution control equipment stream.
EU 004	40 CFR Section 52.21	PSD BACT limit for PM
	40 CFR Section 60.42(a)(2)	Opacity limit
	40 CFR Section 52.21	PSD BACT limit for SO2
	40 CFR Section 52.21 40 CFR Section 60.	PSD BACT limit for NOx, also meets NSPS
	40 CFR pt. 72 and pt. 76 Federal Acid Rain regulations	SO2 allowances and NOx limits and averaging plan
	Minn. R. 7007.0800	Fuel type limits
EU005	No specific rules	Cooling tower
EU006	No specific rules	Cooling tower

EU007	Minn. R. 7011.2300	Standards of Performance for Internal Combustion Engines. Limits opacity and SO2
EU008	unused number	
EU009	Minn. R. 7011.2300	Standards of Performance for Internal Combustion Engines. Limits opacity and SO2
EU010	Minn. R. 7011.2300	Standards of Performance for Internal Combustion Engines. Limits opacity and SO2
EU011	Minn. R. 7011.0715	Standards of Performance for Industrial Process Equipment. Limits PM and opacity
EU012	Minn. R. 7011.0715	Standards of Performance for Industrial Process Equipment. Limits PM and opacity.
EU013	Minn. R. 7011.0715	Standards of Performance for Industrial Process Equipment. Limits PM and opacity.
EU014	Minn. R. 7011.0715	Standards of Performance for Industrial Process Equipment. Limits PM and opacity.
EU015	Minn. R. 7009 and Minn. R. 7011.0715	PM and opacity limits
EU016	Minn. R. 7009 and Minn. R. 7011.0715	PM and Opacity Limits
EU017	Minn. R. 7009 and Minn. R. 7011.0715	PM and Opacity Limits
EU018	Minn. R. 7009 and Minn. R. 7011.0715	PM and Opacity Limits
EU019	Minn. R. 7009 and Minn. R. 7011.0715	PM and Opacity Limits
EU020	Minn. R. 7009 and Minn. R. 7011.0715	PM and Opacity Limits
EU021	Minn. R. 7009 and Minn. R. 7011.0715	PM and Opacity Limits
EU022	40 CFR Part 60, subp. IIII and Minn. R. 7011.2300	Opacity, SO2, CO, Non-methane Hydrocarbons, and PM limits

### 3. Technical Information

#### **CAM Plans for boilers 1-4**

40 CFR Part 64 requires Compliance Assurance Monitoring for emission units that meet the following criteria:

1. The unit is subject to an emission limitation or standard for the applicable regulated air pollutant with exceptions.

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2. The unit uses a control device to achieve compliance, and
3. The unit has potential pre-control device emissions of the pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for the source to be classified as a major source.

Emission units with a continuous emission monitor are exempt from this requirement under 40 CFR § 64.2(b)(vi).

The four boilers meet the above criteria for particulate emissions control.

**EU001 and EU002**, power boilers with baghouse for PM control

Performance Criteria required by 40 CFR pt. 64 include:

- Representative data – data must be representative of emissions or the chosen parameter, considering, for instance, the location of the monitor.

*The test results below show that opacity is a greater percentage of the limit than the tested particulate rate. This makes opacity the limiting pollutant. The proposed method of compliance demonstration is opacity monitoring. The permit also requires periodic stack emission testing and control equipment monitoring in addition to the opacity monitoring.*

Test date 6/2002, EU001, 002

	Test Results	Permit Limit
PM	0.02 lb/MMBtu	0.1 lb/MMBtu
Opacity	5 %	20 %

*The parameter indicating proper operation of each baghouse is opacity. Opacity is measured with a certified continuous opacity monitor (COM)*

- Verification procedures – for new or modified monitors, verification of the operational status.

*The monitors are already in place and operational.*

- Quality assurance and quality control practices (QA/QC)

*MPCA standard practice is to require an O and M plan for all air pollution control equipment, including a corrective action plan. Certain elements of monitoring, operation and maintenance of the control equipment are included in the permit*

- Frequency of data collection

*Continuous*

**EU003**, power boiler with alkaline flyash scrubber for PM control (currently)

Performance Criteria required by 40 CFR pt. 64 include:

- Representative data – data must be representative of emissions or the chosen parameter, considering, for instance, the location of the monitor.

*Until the modification of the boiler and its pollution control equipment stream, Minnesota Power proposes the following: Opacity monitoring alternative - monitor the following operating parameters for CE003: 1)prequench slurry flow; 2)prequench slurry pressure; 3)high pressure slurry flow; 4)high pressure slurry pressure. The proposed method of compliance demonstration after the modification of Boiler 3 and its pollution control equipment stream is opacity monitoring. The permit also requires periodic stack emission testing and control equipment(fabric filter) monitoring in addition to the opacity monitoring.*

- Verification procedures – for new or modified monitors, verification of the operational status.

*The control equipment monitors for the wet particulate scrubber are already in place and operational. The opacity monitor will be operational prior to resuming regular operation of Boiler 3 following modification of it and its pollution control equipment stream.*

- Quality assurance and quality control practices (QA/QC)

*MPCA standard practice is to require an O and M plan for all air pollution control equipment, including a corrective action plan. Certain elements of monitoring, operation and maintenance of the control equipment are included in the permit*

- Frequency of data collection

*Continuous for the pollution control equipment parameters prior to the modification, and continuous once the opacity monitor is installed and used for monitoring.*

**EU004**, power boiler with a venturi scrubber and ESP for PM control

Performance Criteria required by 40 CFR pt. 64 include:

- Representative data – data must be representative of emissions or the chosen parameter, considering, for instance, the location of the monitor.

*The test results below show that opacity is a greater percentage of the limit than the tested particulate rate. This makes opacity the limiting pollutant. The proposed method of compliance demonstration is opacity monitoring. The permit also requires periodic stack emission testing and pollution control equipment monitoring in addition to the opacity monitoring.*

Test dates 7-15-03, test 8/2002, EU004

	<u>Test Results</u>	<u>Permit Limit</u>
PM	0.027 lb/MMBtu	0.1 lb/MMBtu
Opacity	18 %	20 %

- Verification procedures – for new or modified monitors, verification of the operational status.

*The monitors are already in place and operational. The permit contains requirements for operation, maintenance, and calibration of the opacity monitor.*

- Quality assurance and quality control practices (QA/QC)

*MPCA standard practice is to require an O and M plan for all air pollution control equipment, including a corrective action plan. Certain elements of monitoring, operation and maintenance of the control equipment are included in the permit*

- Frequency of data collection

*Continuous*

### **Dispersion Modeling**

Dispersion modeling was required for the facility for SO<sub>2</sub>, NO<sub>x</sub>, and particulate matter as part of the MPCA's policy on compliance demonstration with ambient standards for all facilities with potential and actual emissions above a specified level. Minnesota Power's Clay Boswell plant's emission subjected the plant to the requirement to dispersion model for the above mentioned pollutants. Minnesota Power is being required by this permitting action to re-perform the dispersion modeling to accurately reflect the stack parameters of Boiler 3. The dispersion modeling will be performed with the post-modification stack parameters.

The facility was also required to complete dispersion modeling for CO as part of this permitting action. The results of that dispersion modeling are attached.

### **3.1 Calculations of Potential to Emit**

Calculations of potential emissions for Boiler 3 after modification, and new auxiliary equipment are attached. Calculations of potential emissions for the entire facility prior to and after modification of Boiler 3 are also presented.

### **3.2 Periodic Monitoring**

In accordance with the Clean Air Act, it is the responsibility of the owner or operator of a facility to have sufficient knowledge of the facility to certify that the facility is in compliance with all applicable requirements.

In evaluating the monitoring included in the permit, the MPCA considers the following:

- The likelihood of violating the applicable requirements;
- Whether add-on controls are necessary to meet the emission limits;
- The variability of emissions over time;
- The type of monitoring, process, maintenance, or control equipment data already available for the emission unit;
- The technical and economic feasibility of possible periodic monitoring methods; and

- The kind of monitoring found on similar units elsewhere.

Table 4 summarizes the periodic monitoring requirements for those emission units for which the monitoring required by the applicable requirement is nonexistent or inadequate.

#### Periodic Monitoring

Emission Unit or Group	Requirement (basis)	Additional Monitoring	Discussion
GP004	SO <sub>2</sub> limits for SV001, 002, 003, and 004	CEM	
SV004	SV004 gas exit temperature This minimum temperature requirement is necessary to ensure adequate emissions dispersion.	Measured and recorded hourly	
EU001	PM $\leq$ 0.1 lb/MMBtu based on PSD modeling 40 CFR Section 52.21(k)	Monitoring, I and M, stack emission testing, and recordkeeping for fabric filter plus CAM requirements	
	Opacity $\leq$ 20 % with exception Minn. R. 7011.0510, subp. 2	COM	
	SO <sub>2</sub> $\leq$ 4 lb/MMBtu for solid fuel, 2 lb/MMBtu for liquid Minn. R. 7011.0510, subp. 1	CEM	Federal acid rain monitoring applies
	SO <sub>2</sub> $\leq$ 1.18 lb/mmBtu when emissions are vented through SV001	CEM	
	NO <sub>x</sub> limits and averaging plan	CEM	Federal acid rain monitoring applies
EU002	PM $\leq$ 0.1 lb/MMBtu based on PSD modeling 40 CFR Section 52.21(k)	Monitoring, I and M, stack emission testing, and recordkeeping for fabric filter plus CAM requirements	
	Opacity $\leq$ 20 % with exception Minn. R. 7011.0510, subp. 2	COM	
	SO <sub>2</sub> $\leq$ 4 lb/MMBtu for solid fuel, 2 lb/MMBtu for liquid Minn. R. 7011.0510, subp. 1	CEM	Federal acid rain monitoring applies

Emission Unit or Group	Requirement (basis)	Additional Monitoring	Discussion
	$SO_2 \leq 1.18 \text{ lb/mmBtu}$ when emissions are vented through SV001	CEM	
	NOx limits and averaging plan	CEM	Federal acid rain monitoring applies
EU003 Boiler 3 prior to modifications	$PM \leq 0.6 \text{ lb/MMBtu}$ Minn. R. 7011.0510, subp. 1	Monitoring, I and M, and recordkeeping for wet scrubber plus CAM requirements	
	Opacity $\leq 20\%$ with exceptions	COM	
	$SO_2 \leq 4 \text{ lb/MMBtu}$ for solid fuel, 2 lb/MMBtu for liquid Minn. R. 7011.0510, subp. 1	CEM	
	$SO_2 \leq 2.97 \text{ lb/MMBtu}$ as 1-hr avg. when EU001 and EU002 are also operating and vented through SV001 Minn. R. 7009.0020	CEM	
	$NO_x \leq 0.45 \text{ lb/MMBtu}$ annual avg.	CEM	
EU003 After modifications	$PM \leq 0.014 \text{ lb/MMBtu}$ BART	Monitoring, I and M, stack performance testing, and recordkeeping for fabric filer plus CAM requirements	
	$PM_{10} \leq 0.035 \text{ lb/mmBtu}$ BART	Monitoring, I and M, stack performance testing and recordkeeping for fabric filer plus CAM requirements	
	$SO_2 \leq 0.09 \text{ lb/MMBtu}$ BART	CEM	

	NO <sub>x</sub> ≤ 0.07 lb/MMBtu 30 day rolling BART	CEM	
	Hydrogen fluoride ≤ 0.0018 lb/mmBtu Title I Condition	Periodic stack emission testing	
	CO ≤ 0.15 lb/mmBtu BACT	CEM	
	Lead ≤ 0.00004 lb/mmBtu	Period stack emission testing, operation and monitoring of control equipment	
EU004	PM ≤ 0.1 lb/MMBtu 40 CFR § 52.21 BACT limit	Monitoring, I and M, and recordkeeping for ESP plus CAM requirements	
	Opacity ≤ 20 % with exception 40 CFR Section 60.42(a)(2)	COM	
	SO <sub>2</sub> ≤ 1.2 lb/MMBtu for solid fuel SO <sub>2</sub> ≤ 0.8 lb/MMBtu for liquid fuel 40 CFR § 52.21 BACT limit and 40 CFR § 60.43	CEM	
	NO <sub>x</sub> ≤ 0.7 lb/MMBtu for solid fuel NO <sub>x</sub> ≤ 0.3 lb/MMBtu for solid fuel 40 CFR § 52.21 BACT limit	CEM	
EU005	None	None	Particulate emissions due to drift loss are limited by proper operating practices to limit total dissolved solids in cooling water
EU006	None	None	Particulate emissions due to drift loss are limited by

			proper operating practices to limit total dissolved solids in cooling water
EU007 EU009 EU010	Opacity $\leq$ 20 % Minn. R. 7011.2300	None	Internal combustion engines for backup electrical generators. Opacity unlikely to be exceeded with fuel specifications, and engines are limited use.
	SO <sub>2</sub> $\leq$ 0.5 lb/MMBtu	None	Use of diesel fuel oil guarantees compliance with the limit
EU011	PM $\leq$ IPER Minn. R. 7011.0710	Monitoring, I and M, and recordkeeping for fabric filter	
EU012	PM $\leq$ IPER Minn. R. 7011.0710	Monitoring, I and M, and recordkeeping for fabric filter	
EU013	PM $\leq$ IPER Minn. R. 7011.0710	Monitoring, I and M, and recordkeeping for fabric filter	
EU014	PM $\leq$ IPER Minn. R. 7011.0710	Monitoring, I and M, and recordkeeping for fabric filter	
EU015	PM $\leq$ 0.01 gr/dscf Title I Condition	Monitoring, I and M, and recordkeeping for fabric filter	
EU016	PM $\leq$ 0.01 gr/dscf Minn. R. 7009 and Minn. R. 7011.0715	Monitoring, I and M, and recordkeeping for fabric filter	
EU017	PM $\leq$ 0.005 gr/dscf Minn. R. 7009 and Minn. R. 7011.0715	Monitoring, I and M, and recordkeeping for fabric filter	
EU018	PM $\leq$ IPER Minn. R. 7009 and Minn. R. 7011.0715	Monitoring, I and M, and recordkeeping for fabric filter	
EU019	PM $\leq$ 0.005 gr/dscf Title I Condition	Monitoring, I and M, and recordkeeping for fabric filter	
EU020	PM $\leq$ 0.005 gr/dscf	Monitoring, I and M, and recordkeeping for	



	Minn. R. 7009 and Minn. R. 7011.0715	fabric filter	
EU021	PM $\leq$ 0.005 gr/dscf Minn. R. 7009 and Minn. R. 7011.0715	Monitoring, I and M, and recordkeeping for fabric filter	
EU022	Limits set by Subp. IIII	Operation and monitoring set by regulation	

### **3.3 Insignificant Activities**

Minnesota Power Boswell has several operations which are classified as insignificant activities. These are listed in the Appendix to the permit.

### **3.4 Permit Organization**

In general, the permit meets the MPCA Delta Guidance for ordering and grouping of requirements. One area where this permit deviates slightly from Delta guidance is in the use of appendices. While appendices are fully enforceable parts of the permit, in general, any requirement that the MPCA thinks should be tracked (e.g., limits, submittals, etc.), should be in Table A or B. The main reason is that the appendices are word processing sections and are not part of the tracking system. Violation of the appendices can be enforced, but the computer system will not automatically generate the necessary enforcement notices or documents. Staff must generate these.

### **3.5 Comments Received**

Public Notice Period: February 5, 2007 – March 6, 2007

EPA 45-day Review Period: February 5, 2007 – March 21, 2007

No comments were received during the public notice period. Mercury monitoring requirements were added (per Anne Jackson's request) for EU 001 – 004 Boilers.

## **4. Conclusion**

Based on the information provided by the Permittee, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 06100004-003 and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Jenny L. Reinertsen, P.E. (permit writer/engineer)  
Lea Nyberg (worked with Anne Jackson and Andy Place on mercury monitoring requirements and issued permit)  
Robert Beresford (enforcement)  
Andrew Place (stack testing)  
Marshall Cole (peer reviewer)

Attachments to TSD:

- Future Potential minus Past Actual Analysis
- BACT Analysis
- CO Ambient Impact Analysis
- State Environmental Review Discussion

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- Calculations of potential emissions

***PSD Analysis, Future Potential minus Past Actual for the project***

Pollutant	Future Potential	Past Actual	Difference	Threshold	PSD, yes or no
CO	2204	1346	+859	100	Yes
Fluorides	26.6	25.1	+1.4	3	No
Lead	0.54	0.22	+0.33	0.6	No
NOx	1029	4809	-3780	40	No
PM	254	2732	-2478	25	No
PM10	514	1303	-789	15	No
SO2	1323	12097	-10,774	40	No
Sulfuric Acid Mist	30	278	-247	7	No
VOC	50	43	+7	40	No

***BACT Analyses: Source: Air Emission Permit Application***

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## **6.0 Control Technology – SO<sub>2</sub>, NO<sub>x</sub>, PM, PM<sub>10</sub>**

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This section proposes emission limits for Unit 3 for SO<sub>2</sub>, NO<sub>x</sub>, PM and PM<sub>10</sub>. As noted in Section 2.0, Unit #3 is a BART eligible unit. Therefore, BART must be installed in the future. Minnesota Power proposes to use this permit action to establish BACT for the unit and thereby avoid the need for a BART determination at a latter date. BACT technologies and emission limits will be established for SO<sub>2</sub>, NO<sub>x</sub>, PM, and PM<sub>10</sub>. The proposed control technologies and emission limits meet BACT and therefore, it is reasonable to incorporate those limits in this process and address the BART issue directly at this time.

As discussed in Section 5.1, BACT consists of an emission limit and a technology. A BACT analysis is conducted in this section for each SO<sub>2</sub>, NO<sub>x</sub>, PM, and PM<sub>10</sub>. EPA's top-down BACT analysis process as outlined in Section 5.1 is followed in each case. Available technologies are identified and ranked. Technically infeasible technologies are eliminated. The remaining highest ranking (i.e. most efficient) technology is the 'top' technology, and is proposed unless shown to be infeasible for economic reasons. In each case, for Unit #3, the top ranking feasible technology is chosen. Emission limits are established based on RBLC data and equipment capabilities.

The U.S. Environmental Protection Agency's (US EPA's) RACT/BACT/LAER Clearinghouse (RBLC) was searched to determine BACT limits for similar projects for each pollutant. As for CO, an RBLC search was conducted for coal-fired boilers. The search went back 10 years and no boiler size limits were included. Only PSD-BACT limits were used in this analysis. The search results were then sorted to remove data entries (cases) that were not applicable to the proposed project. Entries were removed where the boilers were fluidized bed or circulating fluidized bed combustion units as these units are not comparable to the pulverized coal, tangentially fired Unit 3.

Note that Unit 3 is an affected source under 40 CFR Part 75. Continuous emission monitoring (CEM) requirements from Part 75 apply to Unit 3 for SO<sub>2</sub> and NO<sub>x</sub>. Those CEM requirements will continue to apply and will set the basic monitoring requirements for those pollutants after new controls are installed.

CD-01 forms are included at the end of this section for each pollutant.

### **6.1 SULFUR DIOXIDE**

#### **6.1.1 Available Technologies – SO<sub>2</sub>**

Table 6-1 summarizes the proven and available control technologies for emissions of SO<sub>2</sub>.

Table 6-1. SO<sub>2</sub> Control Options

<b>Control Technology</b>	<b>Control Efficiency</b>	<b>Technically Feasible</b>	<b>Energy Impacts</b>	<b>Non-Air Quality Environmental Impacts</b>
Wet Scrubber with Alkalai Injection	80 to 95% (AP-42 Table 1.1-1, 9/98, for Lime/limestone) Up to 97% in RBLC	Yes	Increased Electrical Power Usage	Reagent Handling and Increased Wastewater
Dry Scrubbing	73% - 94.5% in RBLC Data	Yes	Increased Electrical Power Usage	Increased Solid Waste

#### Wet Scrubber with Alkalai Injection

A wet scrubber with alkalai injection is a type of post combustion flue gas desulfurization (FGD) technique used to remove SO<sub>2</sub> formed during combustion. SO<sub>2</sub> is removed by injecting an alkalai such as limestone, to absorb SO<sub>2</sub> in the flue gas. Wet scrubbers with caustic are a technically feasible control option for SO<sub>2</sub> emissions.

#### Dry Scrubbing - Spray Dryer

Similar to a wet scrubber, a spray dryer is a type of post combustion FGD technique used to remove SO<sub>2</sub> formed during combustion by injecting a calcium- or sodium-based reagent to absorb SO<sub>2</sub> in the flue gas. Spray dryers utilize slurry a with a higher sorbent concentration and the process produces a dry waste product that must be collected by a particulate matter control device. Spray dryers are most commonly used in tandem with fabric filters. Spray dryers are a technically feasible control option for SO<sub>2</sub> emissions.

### **6.1.2 RBLC Data – SO<sub>2</sub>**

New and existing units are included in the RBLC data, as well as data for both wet and dry scrubbing systems. The data is summarized in Table 6-2 located at the end of Section 6.0 (prior to CD-01 forms). BACT emission data is summarized below:

- Wet Systems (5 listings) – 0.0976 – 0.167 l lbs/MMBtu.
- Wet System Average – 0.123 lbs/MMBtu
- Most Recent Wet System – 0.1 lbs/MMBtu
- Dry Systems (14 listing) – 0.09 – 0.48 lbs/MMBtu
- Dry System Average – 0.249 lbs/MMBtu
- Most Recent Dry System – 0.161 lbs/MMBtu

Emission rate averaging times vary and include maximum hourly (1x), 2-hour fixed averages (3x, all in Wyoming), 24-hour rolling/block averages (3x), 30-day rolling (7x), and 12-month rolling (1x).

### 6.1.3 Proposed BACT – SO<sub>2</sub>

BACT is proposed to be a wet scrubbing system with an emission rate of 0.09 lbs/MMBtu, compliance to be determined on a 30-day rolling average basis. Wet systems are the highest ranking technology and therefore the technology choice is the 'top'. The proposed emission rate is equivalent to the lowest value in the RBLC database and is lower than the lowest value for a wet system.

The averaging time is proposed to be 30-day rolling average. This is the most frequent value in the database. It is likely that many of the shorter term averages were required for compliance with National Ambient Air Quality Standards (NAAQS) without consideration related to BACT.

Compliance will be determined using an SO<sub>2</sub> CEM. The standard is proposed to apply at all times except startup, shutdown and malfunction.

## 6.2 NITROGEN OXIDES

### 6.2.1 Available Technologies - NO<sub>x</sub>

Table 6-3 summarizes the proven and available control technologies for emissions of NO<sub>x</sub>.

Table 6-3. NO<sub>x</sub> Control Options

<b>Control Technology</b>	<b>Control Efficiency*</b>	<b>Technically Feasible</b>	<b>Energy Impacts</b>	<b>Non-Air Quality Environmental Impacts</b>
Selective Catalytic Reduction (SCR)	75 to 85%	Yes	Increased Electrical Power Usage	Catalyst Disposal and Reagent Handling
Selective Non-Catalytic Reduction (SNCR)	30 to 60%	Yes	Increased Electrical Power Usage	Reagent Handling
Low NO <sub>x</sub> Burners	35 to 55%	Yes	Negligible	None
Over-Fire Air	20 to 30%	Yes	Negligible	None
Flue Gas Recirculation	15 to 30%	Yes	Negligible	None
Good Combustion Practice	10 to 20%	Yes	Negligible	None

\*AP-42, Table 1.1-2, 9/98

#### Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is a post combustion control technique that involves the injection of ammonia into the flue gas. Aqueous ammonia is injected into the flue gas stream, upstream of the SCR catalyst bed, where it mixes with the NO<sub>x</sub> to form water and molecular nitrogen. The reactions take place on the surface of the catalyst, the function of which is to effectively lower the activation energy of the NO<sub>x</sub> decomposition reactions. Depending on system design and the inlet NO<sub>x</sub> level, NO<sub>x</sub> removal of up to 85 percent is achievable at optimum conditions. Depending on the catalyst, NO<sub>x</sub> reduction occurs within a reaction window of 400 to 1,100 degrees Fahrenheit. SCR is a technically feasible control option for NO<sub>x</sub> emissions for Unit #3.

#### Selective Non-Catalytic Reduction

Selective non-catalytic reduction (SNCR) involves using ammonia or urea injection similar to SCR technology but at a higher temperature window of 1,600 to 2,200 degrees Fahrenheit. Reagent injection is done prior to combustion gases exiting the boiler. Efficiencies for SNCR are less consistent and lower than SCR due to the lesser level of control of the reaction and lack of a catalyst. SNCR is a technically feasible control option for NO<sub>x</sub> emissions for Unit #3.

#### Low-NO<sub>x</sub> Burners

Low-NO<sub>x</sub> burners (LNBs) limit NO<sub>x</sub> formation by controlling the stoichiometric and temperature profiles of the combustion process in each burner zone. The unique design features of an LNB may create a reduced oxygen level in the combustion zone to limit fuel NO<sub>x</sub> formation, a reduced flame temperature that limits thermal NO<sub>x</sub> formation, and/or a reduced residence time at peak temperature which also limits thermal NO<sub>x</sub> formation. LNBs are a technically feasible control option for NO<sub>x</sub> emissions for Unit #3.

#### Over-Fire Air

Over-fire air (OFA) is a technique in which a percentage of the total combustion air is diverted from the burners and injected through ports above the top burner level. OFA limits NO<sub>x</sub> by suppressing thermal NO<sub>x</sub> by partially delaying and extending the combustion process resulting in less intense combustion and cooler flame temperatures. OFA also suppresses fuel NO<sub>x</sub> formation by reducing the concentration of air in the combustion zone where volatile fuel nitrogen is evolved. OFA is a technically feasible control option for NO<sub>x</sub> emissions.

#### Flue-Gas Recirculation

Flue gas recirculation (FGR) involves extracting a portion of the flue gas from the economizer section or air heater outlet and readmitting it to the furnace through the furnace hopper, the burner windbox, or both. This method reduces the concentration of oxygen in the combustion zone, which reduces NO<sub>x</sub> emissions. FGR is a technically feasible control option for NO<sub>x</sub> emissions.

#### Good Combustion Practices

Good combustion practices are techniques which may be used to minimize formation of NO<sub>x</sub> for any combustion process. Good combustion practices are a technically feasible control option for NO<sub>x</sub> emissions.

### **6.2.2 RBLC Data - NO<sub>x</sub>**



The RBLC data is summarized in Table 6-4 located at the end of Section 6.0 (prior to CD-01 forms). Data is separated between existing and new units. As for CO as discussed in Section 5.1.2, new units can incorporate NO<sub>x</sub> formation controls in the design at the time of construction. Therefore, comparison of new and existing units where retrofitting is required, are not necessarily comparable for NO<sub>x</sub>. Data for new and existing units are included but analyzed separately.

BACT emission data from Table 6-4 is summarized below:

- Existing Systems (12 listings) – 0.067 – 0.55 lbs/MMBtu.
- Existing System Average – 0.204 lbs/MMBtu
- Most Recent Existing System (based on date last updated in RBLC) – 0.067 lbs/MMBtu
  
- New Systems (6 listings) – 0.057 – 0.09 lbs/MMBtu
- New System Average – 0.0745 lbs/MMBtu
- Most Recent New System – 0.057 lbs/MMBtu

Emission rate averaging times include maximum 24-hour rolling/block (2x), and 30-day rolling (7x) averages. One listing specifically excludes periods of startup, shutdown and malfunction.

### 6.2.3 Proposed BACT - NO<sub>x</sub>

BACT is proposed to be a combination of in-boiler modifications (overfire air and low NO<sub>x</sub> burners) and SCR with an emission rate of 0.07 lbs/MMBtu, compliance to be determined on a 30-day rolling average basis. SCR is the highest ranking technology and therefore the technology choice is the 'top'. The proposed emission rate is very close to the lowest value in database for existing units (proposed value of 0.07 compared to 0.067 lbs/MMBtu).

The averaging time is proposed to be 30-day rolling average. This is the most frequent value in the database. Compliance will be determined using a NO<sub>x</sub> CEM. The standard will apply at all times except startup, shutdown and malfunction.

## 6.3 PARTICULATE MATTER – FILTERABLE (PM)

### 6.3.1 Available Technologies - PM

Table 6-5 summarizes the proven and available control technologies for emissions of PM.

Table 6-5. PM/PM<sub>10</sub> Control Options

Control Technology	Control Efficiency*	Technically Feasible	Energy Impacts	Non-Air Quality Environmental Impacts
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Table 6-5. PM/PM<sub>10</sub> Control Options

<b>Control Technology</b>	<b>Control Efficiency*</b>	<b>Technically Feasible</b>	<b>Energy Impacts</b>	<b>Non-Air Quality Environmental Impacts</b>
Fabric Filters	>99%	Yes	Minimal Electrical Power Relative to ESPs	Increased Solid Waste
Dry Electrostatic Precipitators (ESPs)	95%	Yes	Increased Electrical Power Usage	Increased Solid Waste
Wet ESPs	95%	Yes	Increased Electrical Power Usage	Increased Wastewater
Wet Scrubbers	90%	Yes	Minimal Electrical Power Relative to ESPs	Increased Wastewater
Cyclones	30-80%	Yes	Minimal Relative to Others	Solid Waste is generated

\* From Table GI-05A.1 in MPCA's instructions.

#### Fabric Filters

Fabric filters use fiberglass or other fabric bags as a filter to collect particulate matter. The particulate-laden air is drawn through the bags and through a layer of accumulated particulate matter collected on the fabric of the filter bags. The collected particulate matter forms a filter cake layer on the bag that enhances the bag's filtering efficiency. Periodically, the fabric filter is placed into a cleaning cycle and the excess particulate matter is removed to a collection system. This cleaning must occur because excessive caking will increase the pressure drop across the fabric filter. Fabric filters have been widely applied to coal combustion sources. Fabric filters are a technically feasible control option for PM emissions.

#### Dry Electrostatic Precipitators

Dry electrostatic precipitation (ESP) technology is also applicable to coal combustion sources. Dry ESPs remove particulate matter from the flue gas stream by charging fly ash particles with a very high direct current (dc) voltage and attracting these particles to charged collection plates. A layer of collected particulate forms on the collection plates (electrodes) and is removed by rapping the electrodes. The collected ash particles drop into hoppers below the precipitator and are periodically removed by the fly ash handling system. Dry ESPs are not as effective as fabric filters at capturing fine particulate because their design favors collection of larger particles. Large particles have a high mass to surface area ratio, which allows a charged particle to be efficiently dragged through the flue gas stream for collection on a charged plate. Fine particulate have a low terminal velocity and do not carry a strong enough electrical charge to result in collection. The high temperature and carbon content of the exhaust stream can lead to explosions in a dry ESP because of the possibility of sparking in the dry ESP. Dry ESPs are a technically feasible control option for PM emissions.

### Wet Electrostatic Precipitators

A wet ESP may have the same precipitator configuration as any type of dry ESP; however, a wet ESP is operated with wet walls instead of dry. The water flow may be applied intermittently or continuously to wash the collected particles into a sump for disposal. Wet ESPs are not as effective as fabric filters at capturing fine particulate for the same reasons as dry ESPs. The advantage of the wet wall precipitator is that it has no problems with rapping re-entrainment or with back coronas. The disadvantage is the increased complexity of the handling of the collected wet slurry which adds to the expense of disposal. Wet ESPs are a technically feasible control option for PM emissions.

### Wet Scrubbing

Wet scrubbing technology uses a liquid for removing particles from gas streams. Wet collectors are designed to incorporate particulates into water droplets. The water droplets are then captured by gravity, impaction on baffles or cyclonic action and removed from the gas stream. Wet scrubbers come in many types and use various mechanisms for incorporating particles into the gas stream. These include sprays, venturi systems, baffles or combinations of these. Wet scrubbers are a technically feasible control option for PM emissions.

### Cyclones

A variety of cyclone options are available. Typically, particulate laden air comes into a cyclone horizontally and spins in a vortex. Heavier material is not able to stay with the gas stream and drops out. Prior to ESPs or fabric filters, cyclones can be useful in removing hot ash or cinders that could ignite. Typically, coal fired boilers would be most likely to use a multi-clone prior to other particulate removal systems – particularly ESPs. Cyclones are technically feasible.

## **6.3.2 RBLC Data - PM**

For PM and PM<sub>10</sub>, a careful review of the RBLC entries was made. Those entries where the compliance determination method is filterable or Method 5 only are included as PM. Where the compliance determination method is filterable plus condensable, those entries were listed as PM<sub>10</sub>. Existing and new systems are treated equally for PM as the add-on controls will be less affected by in-boiler characteristics.

The RBLC data is detailed in Table 6-6 located at the end of Section 6.0 (prior to CD-01 forms) and is summarized below. The data is summarized for listings from 2001 to present. Data for earlier listings is included Table 6-6 for information.

- Range – 2001 to present – 0.012 – 0.03 lbs/MMBtu
- Average – 2001 to present – 0.01845 lbs/MMBtu
- 11 Listings
- 8 Fabric Filters
  - Average for Fabric Filter Entries - 2001 to present – 0.0175 lbs/MMBtu
- 3 ESP's

One listing, WV-0223, indicates that the control will consist of “Dry solid injection w/fabric filter and wet scrubber”. That emission limit is 0.013 lbs/MMBtu. This control scheme closely matches that planned for BEC and is the only unit that mentions the potential for material injection at the fabric filter.

### **6.3.3 Proposed BACT - PM**

BACT is proposed to be a fabric filter with an emission rate of 0.014 lbs/MMBtu, filterable PM only. Fabric filters are the highest ranking technology and therefore the technology choice is the ‘top’. The proposed emission rate is very close to the most comparable limit in the database for a unit where dry solid injection is planned (proposed value of 0.014 compared to 0.013 lbs/MMBtu).

Compliance will be determined via stack testing for filterable PM only, with no condensibles. Compliance is proposed to be determined after the FGD unit. Consistent with NSPS Subpart Da for units with FGD systems, particulate compliance testing will be done using method 5B.

## **6.4 PARTICULATE MATTER LESS THAN OR EQUAL TO 10 MICRONS (PM<sub>10</sub>)**

### **6.4.1 Available Technologies – PM<sub>10</sub>**

The available technologies for PM<sub>10</sub> are the same as those listed for PM. There are three portions of PM<sub>10</sub> that should be considered when considering control technologies.

- Fine particulate - i.e. filterable PM<sub>10</sub>
- Organic condensibles
- Inorganic condensibles

Overall, fabric filters will continue to have the highest efficiency. For the filterable PM<sub>10</sub> portion, the filter ‘cake’ method of removal is the most efficient at capturing small particles. As previously noted ESP’s are inherently less efficient at capturing filterable PM<sub>10</sub>.

With respect to condensibles, only wet scrubbers may have some advantage. Wet scrubbers may remove more organic or inorganic condensibles by transferring them to the scrubbing fluid. However, they can create condensible ‘particles’ at the same time from other materials in the flue gas, due to added moisture. In general, the lower efficiency of wet scrubbers compared to fabric filters for filterable material outweighs their potential advantages for removal of condensibles.

### **6.4.2 RBLC Data – PM<sub>10</sub>**

As noted for PM, a careful review of the RBLC entries was made for PM and PM<sub>10</sub>. Those entries where the compliance determination method is filterable or Method 5 only are included as PM. Where the compliance determination method is filterable plus condensible, those entries were listed as PM<sub>10</sub>. Existing and new systems are treated equally for PM<sub>10</sub> as the add-on controls will be less affected by in-boiler characteristics.

The RBLC data is detailed in Table 6-6 located at the end of Section 6.0 (prior to CD-01 forms) and is summarized below for PM<sub>10</sub>. As for PM the summary below is for listings from 2001 to present.

- Range –2001 to present – 0.012 – 0.10 lbs/MMBtu
- Average – 2001 to Listings – 0.0275 lbs/MMBtu
- 12 Listings
- 8 Fabric Filters only
  - Average for Fabric Filter Entries – 2001 to present – 0.0224 lbs/MMBtu
- 2 ESP's
- 2 with ESPs and fabric filters– 0.015 lbs/MMBtu (LA-0176) and 0.1 lbs/MMBtu (LA-0122)

Some data was available from prior RBLC searches and contacts by Wenck regarding operational dates for these units. In general, little or no data is available for compliance determinations for PM<sub>10</sub> for these units, especially for the newer listings. Construction periods for utility projects are long and therefore, compliance will not be determined for years after permitting. This means that little if any PM<sub>10</sub> performance data for similar units is available at this time, and the validity of the RBLC data for PM<sub>10</sub>, particularly of the newer listings cannot be confirmed by completed compliance testing.

Seven of the RBLC listings 2001 and later list both PM and PM<sub>10</sub>. Of those:

- VA-0296, and WI-0228 list PM as 0.02 and PM<sub>10</sub> as 0.018 lbs/MMBtu. Both are dry systems.
- UT-0065 lists PM as 0.013 and PM<sub>10</sub> as 0.012 lbs/MMBtu.
- SC-0104 lists PM as 0.015 and PM<sub>10</sub> as 0.018 lbs/MMBtu.
- IA-0067 lists PM as 0.027 and PM<sub>10</sub> as 0.025 lbs/MMBtu (dry system).
- WV-0023 and KY-0085 (wet ESP) list PM and PM<sub>10</sub> as 0.018 lbs/MMBtu.

Note that the SC-0104 listing acknowledges the potential impact of condensibles. The PM<sub>10</sub> limit is 1.2 x the PM limit.

### **6.4.3 Proposed BACT – PM<sub>10</sub>**

Experience in Minnesota and elsewhere shows that inclusion of condensibles increases emissions such that PM<sub>10</sub> (filterable plus condensible) emissions are typically higher than PM (filterable only). This is due to the inclusion particularly of inorganic condensibles. Further, for Unit #3, PM<sub>10</sub> testing using method 201A will likely not be possible due to high moisture content in the exhaust. This means the 'true' PM<sub>10</sub> filterable proportion of PM will not be able to be determined. This means that the organic and inorganic condensibles will add to the total PM. The PM<sub>10</sub> proportion of filterable PM should be low given the fabric filter control, however the effect of the FGD cannot be predicted with any certainty at this time. The FGD may affect the filterable proportion of PM<sub>10</sub> as well as the condensibles.

Further, the effect of the influences on PM<sub>10</sub> discussed here increases as the overall emission limit decreases. In other words, the lower the emission limit the higher the condensible proportion is of that emission limit.

In addition, discussions with potential vendors have indicated additional uncertainties and concerns regarding meeting a low PM<sub>10</sub> emission rate. The ultimate fate of SO<sub>3</sub> created across the SCR is one such uncertainty. All vendors indicate that PM<sub>10</sub> guarantees (particularly where method 202 will be used for condensibles) must be higher than PM guarantees. In this particular case vendors have indicated that there is not sufficient information for this particular combination of controls and the fuels used – coal type, SCR, FF, Wet Scrubber with limestone addition – to provide a guarantee at a very low level of emissions for PM<sub>10</sub>.

Given the uncertainties associated with PM<sub>10</sub> emissions in general, and our conversations with vendors in particular, BACT is proposed to be a fabric filter with an emission rate of 0.035 lbs/MMBtu, total PM<sub>10</sub>. Fabric filters are the highest ranking technology and therefore the technology choice is the 'top'. The proposed emission rate reflects current understanding of the impact of condensible test methods on particulate emissions, as well as site specific conditions reflecting other controls, as discussed.

Compliance will be determined using Method 201A and 202 unless 201A is impractical due to moisture content. If that is the case, Method 5 and 202 shall be used.

## ***CO Ambient Impacts Analysis***

**To:** Jenny Reinertsen, Dennis Becker – MPCA  
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**From:** Libbie Henderson - Wenck Associates, Inc.

**Date:** October 26, 2006

**Subject:** Minnesota Power - Boswell Energy Center Proposed Modifications  
CO AERMOD Analysis – Update to Permit Application Dated 8/29/2006  
Wenck File #0959-20

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Additional air dispersion modeling has been completed for Minnesota Power's Boswell Energy Center (BEC) using the AMS/EPA Regulatory Model with Plume Rise Model Enhancements (AERMOD-PRIME or AERMOD) for Minnesota Power's Arrowhead Regional Emission Abatement Program Phase 2. This additional modeling was completed at the request of Minnesota Pollution Control Agency (MPCA) staff. Initial modeling submitted with Minnesota Power's permit application was completed with the Industrial Source Complex model with Plume Rise Model Enhancements (ISC-PRIME). Even though the models were switched from ISC-PRIME to AERMOD, all buildings, source locations, discharge parameters, emission rates and receptor locations were not changed. The only aspects of the modeling that were adjusted include:

- Changing control block parameters to accommodate AERMOD options,
- Upgrading the receptor grid to include hill scale factors from AERMAP, and
- Analyzing the nearby meteorological data for applicable use at BEC.

## **6.5 AERMOD OPTIONS**

Minnesota Power used AERMOD-PRIME, version 04300, to estimate concentrations at and around BEC. All options within AERMOD recommended by the USEPA as regulatory defaults were used. These options include: 1) using elevated terrain algorithms that require the input of terrain height data; 2) using stack-tip downwash as applicable; 3) using routines to process averages during calm winds; and 4) using algorithms to handle missing meteorological data.

## **6.6 RECEPTOR GRID**

Receptor locations used in the AERMOD analysis were the same as the receptor locations documented in the submitted ISC-PRIME analysis. Receptor elevations and hill scale factors for these locations were determined using the AERMOD Terrain preprocessor (AERMAP), version 04300, and USGS 7.5-minute resolution Digital Elevation Model (DEM) files. The option of NADA = 4 was used to reference the NAD83 anchor coordinates based on the AERMAP users manual. A total of 7,171 receptors were used in the ambient air quality analysis.

## **6.7 METEOROLOGICAL DATA**

For refined modeling analysis, USEPA and MPCA guidelines specify the use of either one (1) year of on-site meteorological data, or five (5) years of representative, hourly National Weather Service (NWS) observations. Because no on-site data exists in the format required for the modeling, NWS data must be relied upon in this analysis.

The NWS meteorological data necessary for the AERMOD meteorological preprocessor (AERMET) were based on hourly surface observation data and upper air sounding data. AERMET requires site-specific land use parameters for the Bowen ratio, the albedo, and surface roughness length. MPCA has pre-processed AERMET data for the stations located in Minnesota and surrounding states.



In choosing meteorological data for a particular project, USEPA and MPCA have indicated that site-specific land use and land cover data from the **meteorological station** is preferred over the modeled facility's land use data. However, the meteorological station with the most similar land use and land cover to the project site should be selected. Following MPCA recommendations, all available nearby meteorological stations were compared to the land use and land cover characteristics for BEC.

Using GIS Spatial Analyst™, twelve nominal 30-degree wind sectors were used to determine the land use out to three kilometers from BEC. A three-kilometer upwind fetch is recommended by the AERMET users guide, and is defined in EPA's Guideline on Air Quality Models, published in Appendix W of 40 CFR Part 51. Figure 1 provides a view of the land use data for the BEC site.

Several land use groups defined by the GIS database are specifically covered under the default land use groups within AERMET. Also, multiple land use categories generated by the GIS software describe the same AERMET land use group. Therefore, the following assumptions were made:

- Forest = 0.5 \* deciduous forest + 0.5 \* coniferous forest
- Swamp = bogs + marsh + fens
- Cultivated Land = cultivated land + mining
- Desert/Shrubland = brushland
- Urban = urban + rural developments
- Grassland = grassland + hay + pasture

Table 1 provides the fractional land use for each of the twelve sectors at BEC.

**Table 1. Fractional Land Use per Sector - BEC**

<b>Sector</b>	<b>Water</b>	<b>Forest</b>	<b>Swamp</b>	<b>Cultivated Land</b>	<b>Grassland</b>	<b>Urban</b>	<b>Desert Shrubland</b>
1	0.01	0.20	0.66	0.00	0.08	0.04	0.00
2	0.00	0.17	0.28	0.08	0.36	0.08	0.03
3	0.05	0.14	0.05	0.03	0.46	0.23	0.04
4	0.14	0.33	0.04	0.03	0.24	0.21	0.00
5	0.58	0.21	0.09	0.00	0.10	0.03	0.00
6	0.32	0.30	0.29	0.00	0.08	0.01	0.00
7	0.14	0.28	0.37	0.00	0.19	0.01	0.01
8	0.51	0.25	0.14	0.00	0.02	0.00	0.07
9	0.48	0.09	0.20	0.00	0.16	0.00	0.08
10	0.23	0.21	0.07	0.00	0.45	0.00	0.03
11	0.67	0.03	0.07	0.00	0.19	0.00	0.03
12	0.09	0.25	0.42	0.00	0.21	0.02	0.00

Tables 4-1, 4-2b, and 4-3 from the “User’s Guide for the AERMOD Meteorological Preprocessor (AERMET)” were used to determine the surface roughness, Bowen ratio, and albedo for each sector and season. A weighted average of characteristics by surface area within each wind sector were determined for each season. In accordance with MPCA guidance the site-specific seasons were defined within AERMET by using the monthly frequency setting and the following seasonal breakdown:

- Winter – December through March
- Spring – April and May
- Summer – June through September
- Autumn – October and November

For determination of the Bowen Ratio, moisture conditions can be selected as dry, average and moist. Average moisture conditions were selected for this modeling analysis. The surface roughness, Bowen ratio, and albedo are given in Table 2.

The available observational sites include: Minneapolis/St. Paul, Rochester, Duluth, Hibbing, International Falls, Fargo, Sioux Falls, La Crosse, and Eau Claire. The information documented in Figure 1 shows that the land use surrounding the BEC project site is divided between water, grassland, swampland and forest. The Minneapolis/St. Paul observation site is much more urban than the BEC project site. Therefore, this dataset may be removed from consideration. Duluth is not representative because it is next to Lake Superior and is heavily influenced by the lake. The Rochester, La Crosse, Sioux Falls, and Eau Claire observation sites are located at a much more southern latitude than BEC. Therefore, these datasets may also be removed from consideration.

**Table 2. Albedo, Bowen Ratio, and Surface Roughness - BEC**

Sector Index No.	Sector Area (ft <sup>2</sup> )	Albedo				Bowen Ratio (Avg. Moisture)				Surface Roughness (m)			
		Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn
1	25,361,825	0.35	0.13	0.14	0.16	1.50	0.28	0.27	0.41	0.25	0.41	0.44	0.35
2	25,361,824	0.46	0.15	0.16	0.17	1.62	0.48	0.67	0.92	0.25	0.36	0.42	0.31
3	25,361,825	0.47	0.16	0.16	0.18	1.67	0.65	1.04	1.30	0.37	0.44	0.49	0.39
4	25,361,825	0.42	0.14	0.14	0.16	1.51	0.57	0.76	1.01	0.51	0.61	0.68	0.52
5	25,361,825	0.30	0.13	0.12	0.14	1.50	0.28	0.26	0.40	0.22	0.29	0.32	0.23
6	25,361,825	0.33	0.13	0.12	0.15	1.50	0.31	0.23	0.43	0.29	0.41	0.46	0.33
7	25,361,825	0.38	0.13	0.14	0.15	1.53	0.35	0.33	0.55	0.28	0.42	0.47	0.34
8	25,361,825	0.30	0.13	0.13	0.15	1.83	0.47	0.46	0.76	0.25	0.35	0.39	0.28
9	25,361,825	0.32	0.14	0.14	0.16	1.85	0.43	0.53	0.77	0.10	0.17	0.19	0.14
10	25,361,825	0.44	0.15	0.15	0.17	1.65	0.46	0.59	0.87	0.20	0.29	0.34	0.22
11	25,361,825	0.30	0.14	0.12	0.16	1.64	0.27	0.36	0.48	0.04	0.07	0.08	0.06
12	25,361,825	0.39	0.13	0.14	0.16	1.51	0.34	0.35	0.55	0.27	0.40	0.45	0.33

The remaining stations are Fargo, Hibbing, and International Falls. Surface roughness is the most sensitive surface characteristic in AERMOD. The BEC surface roughness values were weighted by month to determine an annual surface roughness value for each sector. The surface roughness values at the project and meteorological data sites are compared in Table 3. Data for Fargo, Hibbing and International Falls is as provided by the MPCA for those sites.

**Table 3. Project Site and Meteorological Site Surface Roughness Values**

Sector Index No.	Surface Roughness (m)			
	BEC	Hibbing	Fargo	International Falls
1	0.36	0.58	0.07	0.64
2	0.34	0.43	0.36	0.58
3	0.42	0.49	0.65	0.27
4	0.58	0.70	0.65	0.44
5	0.27	0.56	0.65	0.29
6	0.38	0.64	0.65	0.36
7	0.38	0.55	0.65	0.43
8	0.32	0.67	0.36	0.37
9	0.15	0.53	0.07	0.48
10	0.26	0.29	0.07	0.47
11	0.06	0.45	0.07	0.40
12	0.36	0.57	0.07	0.53
Total	0.32	0.54	0.36	0.44

The information presented in Table 3 makes the decision of choosing the meteorological station that best represents the BEC site difficult. The overall average surface roughness at BEC is most similar to the surface roughness at Fargo. However, the Fargo site has many sectors with either rather large surface roughness values (5 sectors @ 0.65 m) or small surface roughness values (5 sectors @ 0.07 m). The BEC site is comprised of a much wider variety of surface roughness values between the 12 sectors. Both Hibbing and International Falls show a wider variety of surface roughness values, similar to the surface roughness distribution of the BEC site. These three meteorological observation sites are also located in different proximities to BEC. Fargo and Hibbing are much closer in latitude to BEC than International Falls. However, Hibbing and International Falls are located closer to BEC (30 and 95 miles, respectively) than Fargo (150 miles).

For these reasons, it is difficult to decide which set of meteorological data best represents the BEC site. Therefore, modeling was completed using all three datasets. This extra step of analysis ensures that maximum impacts will be captured in the modeling analysis. Surface data from the Hibbing, Minnesota airport (ID #94931) and upper air data from the International Falls, Minnesota NWS station (ID #14918) were used for the years 1972 through 1976. Surface data from the Fargo, North Dakota NWS station (ID #14914) and from the International Falls, Minnesota NWS station with upper air data from the St. Cloud, Minnesota NWS station (ID #14926) were used for the years 1986 through 1990. Data used was that available from the MPCA on their website. No changes were made to that data.

## 6.8 MODELING RESULTS

Modeling was performed to determine the maximum ambient concentrations of CO using AERMOD. The modeling demonstration indicated that PSD significant ambient impact levels (SILs) were not exceeded for CO. Therefore, further modeling for the NAAQS/MAAQs compliance is not required. Table 4 shows

the modeling results for BEC. ISC-PRIME results were also included for comparison purposes. Note that AERMOD results were less than ISC-PRIME results in all cases.

As for the original ISC-PRIME analysis, a CO emission rate of 10 times the proposed 24-hour emission limit of 0.15 lbs/MMBtu was used here. This was done to address potential differences between the 1-hour, 8-hour and 24-hour averaging times. This AERMOD analysis provides an even larger margin to address these differences than in the previous ISC-PRIME analysis.

Maximum predicted concentrations of CO were less than the PSD significant monitoring concentrations as well. The monitoring thresholds for CO are also displayed in Table 4. Therefore, pre-construction monitoring is not required for this project.

**Table 4. Modeling Results**

Impact	Carbon Monoxide	
	1-Hour Average ( $\mu\text{g}/\text{m}^3$ )	8-Hour Average ( $\mu\text{g}/\text{m}^3$ )
ISC-PRIME – Hibbing metdata	668.56	130.46
AERMOD – Hibbing AERMET data	317.82	111.97
AERMOD – Fargo AERMET data	282.87	115.26
AERMOD – International Falls AERMET data	240.54	107.90
PSD Significant Ambient Impact Level	2,000 <sup>a</sup>	500 <sup>a</sup>
PSD Significant Monitoring Concentration	---	575 <sup>a</sup>

<sup>a</sup> Never to be exceeded.

***State Environmental Review: Source: Air Emission Permit Application***

The rules of the state environmental quality Board (EQB) specify what projects require environmental review, what level of review and the responsibility for conducting the review. Those requirements are contained in Minn. Rules 4410.0200 - .9910. The state administers the requirements. They are not necessarily related to other forms of environmental review for a project (such as PSD or NSPS, etc.).

There are two levels of review – Environmental Impact Statement (EIS) and Environmental Assessment Worksheet (EAW). And EIS is a detailed analysis of a project and includes analysis of alternatives to the project. An EAW is a general review of the potential impacts of a project. The endpoint of an EAW is a determination as to whether further review via an EIS is required – i.e. would additional environmental review provide additional information helpful in determining whether or not to proceed with a project.

EQB rules (Minn. Rules) 4410.4400 list project types that require mandatory environmental review via an EIS. EQB rules (Minn. Rules) 4410.4300 contain a list of projects that require EAW's. Tables 7.5 and 7.6 located at the end of Section 7.0 list those requirements and include notes as to their applicability to this project. The only potentially applicable requirement relates to the EAW requirement for increases in emissions of air pollutants. That item is discussed in detail in the following section. No other mandatory EAW or EIS requirements apply.

The EQB rules also specify what entity has responsibility for an environmental review (city, county, MPCA, Department of Natural Resources (DNR), etc.). The EAW listing regarding air pollution control is under the jurisdiction of the MPCA. The MPCA is responsible for interpretation and determination as to whether an EAW is required under that item. Therefore, information regarding this requirement is included in this application as the MPCA will be the decision making body on the EAW question.

## 7.1 AIR EMISSIONS INCREASE

Minn. Rules 4410.4300, Subp. 15.A, specifies that a project meeting the following criteria must conduct a mandatory EAW:

*“When potential air emissions increase by 100 tons per year or more of any single air pollutant after installation of air pollution control equipment.”*

### 7.1.1 MPCA Guidance

The MPCA has issued guidance on how to make a determination under Subp. 15.A. That is contained in an MPCA fact sheet entitled “Calculating Air Emission Increases for EAW Applicability” dated October 2005. This methodology differs significantly from the methodology used in Section 4.0 for PSD purposes. The fact sheet states in part (**emphasis added**):

*“To determine whether an EAW is needed, emission increases should be calculated following a method similar to that of a state air permit or modification. This is defined in Minn. Rules 7007.1200, Subp. 3. (non Title I modifications).*

*The state permit calculation compares the potential to emit (PTE) before and after a proposed change. The comparison can be thought of as looking at snapshots in time of the emissions before and after a proposed project.*

*For permits, this calculation method compares hourly emission rates. For EAW’s however, the trigger is in tons per year. Therefore, you would follow the steps described in Minn. Rule 7007.1200, subp. 3.A., 3.B. and 3.C. to obtain a comparison of the potential emissions before and after the proposed project. **After you find the change in the potential hourly emissions rates, you would then make a tons-per-year calculation considering emission control equipment, emission decreases, or long term permit limits as appropriate.** For example if your facility has or is proposing an annual cap on emissions, this limit would be taken into account when deciding if there is an emissions increase.”*

The EAW calculation therefore takes the following general form:

Future maximum hourly allowable emissions (tons/hour) \* 8760 hours per year \* future permit limits on operation hours or capacity (% capacity, % hours, etc.) = Future tons per year.

Past Maximum hourly allowable emission (tons/hour) \* 8760 hours per year \* current permit limits on operation hours or capacity (% capacity, % hours, etc.) = Past tons per year.

Future tons per year – past tons per year = Emission increase for EAW purposes.

Therefore, the EAW calculation assumes the maximum hourly emission rate for all allowed hours of operation (unless prohibited by permit conditions or requirements). The following sections discuss this analysis as it relates to pollutants affected by the proposed project.

### **7.1.2 Air Pollutants With Proposed Add-On Air Pollution Control Equipment**

For future potential emissions, data developed for the PSD analysis (refer to Section 4.0) will be used. The future potential emissions calculations show that emissions of VOCs, lead and



fluorides (uncontrolled) after the modification are less than 100 tons per year and therefore cannot result in the requirement for an EAW and are not discussed further.

For past potential emissions of the remaining pollutants (other than CO which is discussed in section 7.1.3), the potential is calculated by scaling up past actual emissions based on the past actual percent of maximum operations. The following calculation was conducted:

$$\text{Past Actual Emissions} * \text{Past Potential Heat Input/Past Actual Heat Input} \\ = \text{Past Potential Emissions}$$

Note, there is no requirement under EAW policy to segregate PM and PM<sub>10</sub> emissions types between combustion emissions and non-combustion emissions as in the PSD analysis (Section 4.1.1). Therefore they are treated as a group for environmental review purposes.

Table 7-1 shows when comparing future potential emissions to past potential emissions, emissions will decrease, significantly, in all cases. Therefore, further analysis based on EAW criteria is not warranted for the pollutants listed in Table 7-1. This is consistent with the fact that add-on controls (as well as in boiler controls for NO<sub>x</sub>) will be installed as part of the project for all pollutants listed. Note that the majority of emissions decreases for particulates will take place at Unit #3 due to added particulate controls. Particulate controls will also result in decreases of related metal emissions.

**Table 7-1 Summary of Potential Decreases in Emissions**

<b>Pollutant</b>	<b>Future Potential less Past Potential – tons/year</b>
NO <sub>x</sub>	-4,849
PM	-8.592
PM <sub>10</sub>	-946
SO <sub>2</sub>	-47,457
Sulfuric Acid	- 1,320

The MPCA guidance referenced in Section 7.1.1 indicates that the EAW analysis should be done on a maximum hourly basis. The analysis presented above does not strictly adhere to this guidance. However, no increase in capacity will result from the project and further, it is reasonable to assume that the decreases on a short term basis will be significant because air pollution controls will be installed. Therefore it is reasonable to infer that an analysis of short term decreases would yield a similar result. Note that no increase in hourly emissions is planned or anticipated.

### 7.1.3 Carbon Monoxide

Boswell Unit #3 has an existing CO monitor located in the flue gas ductwork just prior to entering the stack. MP is using the data provided from this monitor to aid in determining emission increases over baseline. This data was used to determine past actual emissions. If this data is scaled from past actual to past potential based on heat input (as was done for other pollutants in Section 7.1.2), the increase is above 100 tons per year. However, that analysis does not take into account past emissions on a maximum short-term basis as indicated by MPCA Guidance. That analysis is conducted here.

No add-on pollution controls are proposed for CO. BACT is proposed to be combustion controls and an emission limit of 0.15 lbs/MMBtu on a 24-hour basis. No emission limit on a 1-hour basis is proposed or anticipated. Nor is a 1-hour limit necessary to insure proper boiler operation.

CO emissions from the boiler vary considerably from hour to hour and day to day. As can be seen in Table 7-2, 1-hour average CO emissions range from zero parts per million (ppm) to over 3000 ppm. So for EAW purposes, the question as to how to determine past maximum emissions (as described in Section 7.1.2) arises.

As noted in Section 4.4.5 the CO data for the Unit 3 CO monitoring was validated by testing. It is the best available data. The data included on a CD-ROM in Appendix A of this report.

**Table 7-2 CO Monitor Data Summary – Top 10, 1-Hour CO Values**

**All data in ppm @ 3% O<sub>2</sub>, 1-hour Averages – 1/1/2004 – 5/14/2006**

<b>Top 10 1-hr CO Values, ppm</b>
3473
2439
2359
2297
1931
1873
1624
1394
1366

The MPCA guidance indicates that maximum hourly emissions should be used. However, it does not seem practical to use the worst case (3000+ ppm) in determining past potential as this occurred only once. Further, there is neither a past, nor is a future permit limit on an **hourly** basis proposed, for CO. Given the hour-by-hour variability in CO emissions and because the proposed CO BACT level will be on a 24-hour average basis, MP proposes the EAW analysis be based on a 24-hour average in lieu of a maximum hourly value. This is consistent with the MPCA guidance on EAW applicability where long-term permit conditions should be considered.

The CO data could all be converted to a pounds per hour basis and then to tons per year. However, an alternative is to maintain the data on a ppm basis and compare the data at that level. If the past maximum ppm value is lower than the future maximum ppm value, then there will be no increase in emissions applying the MPCA EAW calculation methodology.

Comparing data on a ppm basis requires that the data be based on a common measurement basis for percent oxygen. Data on the percent oxygen was available in the monitoring data file. These data were used to adjust all data to a common basis of 3% O<sub>2</sub>. The correction was made as follows:

$$\text{ppm CO at 3\% O}_2 = \text{ppm CO at X\% O}_2 * (20.9 - 3\% \text{ O}_2) / (20.9 - X\% \text{ O}_2).$$

Comparing the data on a ppm basis also assumes that there will be no significant change in airflow from the unit. The monitor that provided the CEM data is located in the breeching for stack SV003 (prior to joining with emissions from boilers 1 and 2). At that location, this is a reasonable assumption, particularly when comparing maximum 24-hour average cases, as the heat input capacity of the unit will not be increased in this modification. No significant changes in gas flow rate are planned.

The CO monitor data were reduced to 24-hour block averages. That data is summarized in the Table 7.3.

The proposed BACT value on a 24-hour average basis of 0.15 lbs/MMBtu at 3% O<sub>2</sub> equates to approximately **181 ppm** using f-factor and design airflow for Unit #3 after modifications (Reference Burns & McDonnell calculations 6/16/2006). Table 7-3 data clearly shows that a substantial number of past actual 24-hour block average values are above this value. Specifically, the frequency analysis shows that 17.4% of values from 1/1/2004 – 5/14/2006 are 181 ppm @ 3% O<sub>2</sub> or greater.

**Table 7-3 CO Monitor Data Summary – Frequency Analysis**

**All data ppm, @ 3% O<sub>2</sub>, 24-hour block averages 1/1/2004 – 5/14/2006**

<b>Range – ppm</b>	<b># of 24-Hour Averages</b>	<b>% of 24-Hour Averages</b>	<b>Cumulative %</b>	<b>1-Cummulative %</b>
0-50	431	52.9	52.9	47.1
51-100	109	13.4	66.3	33.7
101-180	133	16.3	<b>82.6</b>	<b>17.4</b>
181-250	61	7.5	90.1	9.9
251-500	69	8.5	98.6	1.4
501-1000	9	1.1	99.7	0.3
>1000	2	0.3	100	0

Using 24-hour periods as the short-term measure in this case shows that future maximum emissions of 181 ppm (24-hour average BACT limit) will be less than the past maximum 24-hour average emission rate of >1000 ppm. Further, 17.4% of the past 24-hour block averages are greater than the 181 ppm value. This means that it is reasonable to say that the 'past maximum' CO emission rate is higher than 181 ppm. Therefore, applying the MPCA guidance of comparisons of past maximum to future maximum on using a 24-hour average, no increase in CO will result and no EAW is required.