

**AIR EMISSION PERMIT NO. 13700015- 001**

**IS ISSUED TO**

Minnesota Power & Light and the City of Duluth

**MINNESOTA POWER AND LIGHT - ML HIBBARD**

30 West Superior Street

Duluth, St. Louis County, Minnesota 55802

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

|                                 |                  |
|---------------------------------|------------------|
| Permit Type                     | Application Date |
| Total Facility Operating Permit | 09/15/95         |

This permit authorizes the Permittee to 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 and with all general conditions listed in Minn. R. 7007.0800, subp. 16, [and all standard permit requirements listed in 40 CFR § 70.6\(a\)](#), which are incorporated by reference. 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 ; Part 70

**Issue Date:** July 14, 1997

**Expiration:** July 14, 2002  
All Title I Conditions do not expire.

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Michael J. Sandusky  
Acting Division Manager  
Air Quality Division

for Peder A. Larson  
Commissioner  
Minnesota Pollution Control Agency

BAB:lao

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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         | (612)296-6300  |
| Outside Metro Area | 1-800-657-3864 |
| TTY                | (612)282-5332  |

The rule 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. Any requirements which have been determined not to apply are listed in Table A of this permit.

The permit shield, however does not apply to: Minn. R. ch. 7030 (Noise Pollution Control).

**FACILITY DESCRIPTION:**

The M.L. Hibbard/Duluth Steam District No. 2 power generating facility is jointly owned by Minnesota Power (MP) and the city of Duluth. Located in the city of Duluth, adjacent to the Lake Superior Paper Industries (LSPI) paper mill, Hibbard combusts a mixture of wood, coal, natural gas and paper mill sludge. The primary mission of Hibbard is to produce steam for LSPI and the associated Superior Recycled Fiber Industries paper recycling facility. Hibbard is also capable of producing electrical energy for the MP system. The site contains four steam generating boilers, four steam turbines, coal handling facilities, wood handling facilities, a 3.4 million gallon fuel oil storage tank and natural gas supply lines. Two small boilers (Boilers No. 1 and No. 2) and the fuel oil supply tank have been out of service since 1981, but can be used if current plans were to change.

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 steam and/or electrical power production or support activities; (3) monitor and control air emissions 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.

### **Steam and Power Generation**

Steam and power generation is accomplished primarily through steam generation in two boilers (Boilers No. 3 and No. 4). Both units have spreader stokers and traveling grates. Emissions are discharged through a common 331 foot stack (Stack No. 1). Boilers No. 1 and No. 2 are smaller units and if used would also discharge air emissions through Stack No. 1.

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

Boilers No. 3 and No. 4 are capable of combusting a mixture of wood, subbituminous coal, natural gas and sludge. The primary fuel is wood which may include wood chips, sawdust, sanderdust, wood bark, chipped railroad ties and other various forms of waste wood such as the wood waste from Superior Wood Systems in Superior, Wisconsin. The wood fuel is supplemented with low-sulfur, subbituminous coal and natural gas. Boilers No. 3 and No. 4 are capable of combusting 100No. wood, 100No. coal, and various combinations of wood, coal, and natural gas. This permit allows for the addition of oily coal (coal with oil spilled on it), oily cellulose-based sorbents (including rags), activated charcoal, and boiler cleaning agents as permitted fuels.

The wood fuel is delivered directly to the plant in covered trucks, unloaded and conveyed directly to the A-frame storage building. The wood fuel is conveyed to the wood metering bins and transferred to the boiler's traveling grate through the auger feed and spreader stoker systems. Combustion occurs in suspension and on the grate.

Coal is delivered to the facility in trucks and unloaded in a three sided enclosure maintained at negative pressure and vented through a fabric filter. Coal is transferred from the unloading facility to storage bunkers by a bucket conveyor system. Air from the bunkers and coal transfer system is vented through a fabric filter. Coal transfer from the bunker to the boilers is accomplished by a totally enclosed conveyor.

Natural gas is supplied to Boilers No. 3 and No. 4 through a pipeline. Natural gas could be supplied to Boilers No. 1 and No. 2 by the same system.

If used in the future as fuel, oil would be delivered by truck and stored in the 3.4 million gallon tank. Piping which would connect the fuel oil storage to the boilers is disconnected.

## **Air Emission Monitoring and Control**

Air emissions from the facility are released primarily as a result of the combustion of wood and coal. Smaller amounts of criteria pollutants are emitted from the combustion of natural gas and the handling and storage of coal and wood fuels. The combustion of wood and coal also results in the emission of some hazardous air emissions.

Continuous Emission Monitors have been installed, tested and certified to measure and record the combustion emissions from Boilers No. 1 through No. 4 exiting the common stack, Stack No. 1. The monitors measure and record information on the following parameters: Sulfur Dioxide, Nitrogen Oxides, opacity, Carbon Monoxide, and volumetric flow and are located in the breaching leading to the stack.

Emissions from Stack No. 1 due to combustion in Boilers No. 3 and No. 4 are controlled by multiple cyclones in series with an electrostatic precipitator for each unit. Boilers No. 1 and No. 2 do not have associated pollution control equipment. Particulates from coal unloading, transfer, and storage are controlled with fabric filter baghouses. Additional particulate control is accomplished through the use of enclosures to limit fugitive emissions from coal and wood unloading operations.

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

Hibbard is designed to operate with a once-through cooling system to dissipate waste heat in the production of electrical energy. Water from St. Louis Bay is pumped through the intake structure, used to condense steam from the back side of the turbine generator and discharged to the bay. Hibbard is not presently generating electricity, so this system is not currently in operation.

The combustion of wood and coal also produces ash, which is collected off the traveling grates, wetted and transferred to a truck. The ash is used as agricultural soil enhancement or is landfilled.

## **Support Activities**

Support activities include the building elevator, vehicle maintenance, general facility activities, energy production equipment maintenance, piping installation and maintenance. These activities can include painting, welding, and cleaning operations. In terms of air emission regulations, these activities are considered insignificant activities for these purposes.

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

**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**

| <b>What to do</b>  | <b>Why to do it</b>  |
|--|--|
| Coal handling: not to exceed 241,200 tons on a 12-month rolling sum. Coal handling operations limited to 8 hours per day.  | Title I Conditions: PSD total facility permit application & impacts analysis |
| Recordkeeping to demonstrate compliance with coal handling limit: By the 15th day of each month, the Permittee shall calculate and record the total coal handled in the previous month, and calculate and record the total coal handled during the previous 12-month period.   | Title I Conditions: PSD total facility permit application & impacts analysis |
| Coal storage and coal conveyors and transfer points must be enclosed.  | Minn. R. 7007.0800, subp. 2  |
| Wet all ash and cover ash haul trucks leaving the facility.  | Minn. R. 7007.0800, subp. 2  |
| Operate a live-bottom hopper, truck unloading system for wood.   | Minn. R. 7007.0800, subp. 2  |
| Cover all wood hauling systems except for unloading.   | Minn. R. 7007.0800, subp. 2  |
| Access areas, roads, parking facilities<br>(1) Install asphalt or concrete surfaces or chemical agents on all active truck haul roads of the coal handling facility when the coal throughput by truck is 200,000 tons or greater. All paved roads and areas shall be cleaned to minimize the discharge to the atmosphere of fugitive particulate emissions. Such cleaning shall be accomplished in a manner which minimizes resuspension of particulate matter.<br>Access areas surrounding coal stockpiles and parking facilities which are located within a coal handling facility shall be treated with water or chemical agents. | Minn. R. 7011.1105   |
| Truck and hauler unloading stations: Control fugitive particulate emissions from the unloading of trucks or haulers by dust suppression methods so that emissions from such sources are minimized.   | Minn. R. 7011.1105   |
| Enclosed coal handling facilities or emissions units not specifically covered by any other provision in these parts. If exhaust gases from any enclosed coal handling facility exceed 20 percent opacity, then the owner or operator of such facility shall select and implement one of the following further controls:<br><br>(1) install exhaust air system and control exhaust gases so that particulate emissions in such gases do not exceed 0.020 gr/dscf;<br><br>(2) control exhaust gases using dust suppression methods so that particulate emissions do not exhibit greater than 20 percent opacity.                       | Minn. R. 7011.1105   |
| Operating practices: Clean up all coal spilled on roads or access areas as soon as practicable using methods that minimize the amount of dust suspended.<br><br>Maintain air pollution control equipment in proper operating condition and utilize air pollution control systems as designed.  | Minn. R. 7011.1105   |
| The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.   | Minn. R. 7007.0800, subp. 16   |
| 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   |
| Comply with the Fugitive Control Plan: The Permittee shall follow the actions and recordkeeping specified in the control plan. The plan may be amended by the Permittee with the Commissioner's approval. If the Commissioner determines the Permittee is out of compliance with Minn R. 7011.0150 or the fugitive control plan, then the Permittee may be required to amend the control plan and/or to install and operate particulate matter ambient monitors as requested by the Commissioner.  | Minn. Stat. Section 116.07, subd. 4a; Minn. R. 7007.0800, subp. 2            |
| 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.   | Minn. R. 7007.0800, subp. 14 & subp. 16(J)                                   |
| 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, such as for system breakdowns, repairs, calibration checks, and zero and span adjustments (as applicable). Monitoring records should reflect any such periods of process shutdown.   | Minn. R. 7007.0800, subp. 4(D)   |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

|  |  |
|--|--|
| Monitoring Equipment: Install or make needed repairs to monitoring equipment within 60 days of issuance of the permit if monitoring equipment is not installed and operational on the date the permit is issued.   | Minn. R. 7007.0800, subp. 4(d)   |
| Monitoring Equipment Calibration: Annually calibrate all required monitoring equipment (any requirements applying to continuous emission monitors are listed separately in this permit).   | Minn. R. 7007.0800, subp. 4(D)   |
| For all baghouses controlling emissions from enclosed coal handling equipment including those listed as insignificant activity:<br>1. Inspect quarterly, or as required by manufacturing specifications, all components that are not subject to wear or plugging, including structural components, housing, ducts, and hoods. Maintain a written record of the inspection and any action resulting from the inspection.<br>2. Inspect monthly, or as required by manufacturing specifications, all components that are subject to wear or plugging. Maintain a written record of the inspection and any action resulting from the inspection.<br>3. Check visible emissions once every 48 hours. If visible emissions exist, inspect equipment for evidence of malfunction, including broken bags. Record the results of the inspection, and any action taken. | Minn. R. 7011.1105   |
| Oily Floor Dry: Limit combustion to (for entire facility): 1) cellulose based only (including rags), 2) 25 tons per year, and 3) 1.25 tons per hour.   | Title I Condition: to ensure that the emissions increase from the addition of the fuel type is less than significant as defined by 40 CFR Section 52.21; Minn. R. 7007.0800, subp. 2 |
| Activated Charcoal: Limit combustion to (for entire facility): 1) material generated on site, material received from Lake Superior Paper, or material received from other off-site facilities that is representative of the same material, 2) 25 tons per year, and 3) 3 tons per hour.  | Title I Condition: to ensure that the emissions increase from the addition of the fuel type is less than significant as defined by 40 CFR Section 52.21; Minn. R. 7007.0800, subp. 2 |
| 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   |
| Oral Notification of Deviations Endangering Human Health or the Environment: Within 24 hours of discovery, orally notify the Commissioner of any deviation from permit conditions which could endanger human health or the environment.  | Minn. R. 7007.0800, subp. 6(A)   |
| Discovery of Deviations Endangering Human Health or the Environment Report (written): due two working days after discovery of deviation, submit a written description of any deviation endangering human health or the environment to the Commissioner. Include the following information in this written description: cause of the deviation; exact dates of the period of the deviation; if the deviation has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the deviation.   | Minn. R. 7007.0800, subp. 6(A)   |
| 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.  | Minn. R. 7007.1150 through Minn. R. 7007.1500  |
| Shutdowns: Notify the Commissioner at least 24 hours in advance of shutdown of any process or control equipment, if the shutdown would cause an increase in the emission of air contaminants. At the time of notification, notify the Commissioner of the cause of the shutdown and the estimated duration. Notify the Commissioner again when the shutdown is over.   | Minn. R. 7019.1000, subp. 1  |
| Breakdowns: Notify the Commissioner immediately of a breakdown of more than one hour duration of any process or control equipment, if the breakdown causes an increase in the emission of air contaminants. At the time of notification or as soon thereafter as possible, the Permittee shall also notify the Commissioner of the cause of the breakdown and the estimated duration. Notify the Commissioner again when the breakdown is over.  | Minn. R. 7019.1000, subp. 2  |
| Shutdown and Breakdown Reporting Requirements 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.  |  |
| Emission Fees: due 60 days after receipt of an MPCA bill   | Minn. R. 7002.0065   |
| 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)   |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

|  |                                |
|--|--------------------------------|
| Record keeping: 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.   | Minn. R. 7007.0800, subp. 5(B) |
| 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, fuel analyses and certifications, and copies of all reports required by the permit. Records must conform to the requirements listed in Minn. R. 7007.0800, subp. 5(A). | Minn. R. 7007.0800, subp. 5(C) |
| 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) |
| No emissions of acidic or alkaline substances in such an amount that the downwind fallout rate at any place where an adverse effect could occur exceed the upwind fallout rate by five or more sopots per hour, measured in accordance with Minn. R. pt. 7011.0405.  | Minn. R. 7011.0400             |
| 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 only requirement and is not federally enforceable.  | Minn. R. 7030.0010-7030.0080   |
| Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C.   | Minn. R. ch. 7017              |
| Operating and/or production limits will be placed on emission units EU001 and EU002 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             |



**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

**Subject Item:** GP 001 Boilers 3 and 4**Associated Items:** EU 003 Boiler 3 Cyclone & ESP

EU 004 Boiler 4 Cyclone &amp; ESP

MR 101

MR 102

MR 103

MR 104

MR 107

MR 108

| What to do   | Why to do it  |
|--|---|
| COMS Monitoring Data: Owners or operators of all COMS shall reduce all data to six-minute averages. Opacity averages shall be calculated from all equally spaced consecutive 10-second (or shorter) data points in the averaging period.   | Minn. R. 7007.0800, subp. 2                                 |
| COMS Continuous Operation: Except for system breakdowns, repairs, calibration checks, and zero and span adjustments, and boiler downtimes, all COMS shall be in continuous operation.  | Minn. R. 7007.0800, subp. 2                                 |
| COMS Daily Calibration Drift (CD) Check: The CD shall be quantified and recorded at zero (low-level) and upscale (high-level) opacity at least once daily. The COMS must be adjusted whenever the calibration drift (CD) exceeds twice the specification of PS-1 of 40 CFR 60, Appendix B.   | Minn. R. 7007.0800, subp. 2; 40 CFR Section 60.13(d)        |
| COMS Calibration Error Audit: due before end of each calendar half-year following COMS Certification Test . Conduct audits at least 3 months apart but not greater than 8 months apart.  | Minn. R. 7007.0800, subp. 2                                 |
| Notification that Continuous Opacity Monitoring System (COMS) data will be used to determine compliance with opacity standard during performance test: due 30 days prior to the date of performance test.  | 40 CFR Section 60.7(a)(7)                                   |
| Permittee is allowed to measure the combined effluent from two or more affected facilities subject to the same emission standard.  | 40 CFR Section 60.13(g)                                     |
| 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.   | Minn. R. 7007.0800, subp. 2, 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 App B.   | 40 CFR pt. 75 App B, section 2.1; 40 CFR pt. 60, Appendix F |
| CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar half-year following CEM Certification Test . Conduct a RATA on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75 App B. If the RATA results indicate a relative accuracy of 7.5% or less, the next RATA is not required for twelve months.  | 40 CFR pt. 75 App B, section 2.3; 40 CFR pt. 60, Appendix F |
| Linearity and Leak Check Test (Acid Rain Program): due before end of each calendar quarter following CEM Certification Test . Conduct a quarterly linearity test on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75 App B.  | 40 CFR pt. 75 App B, section 2.2; 40 CFR pt. 60, Appendix F |
| Recordkeeping: maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the facility including any malfunction of the air pollution control equipment or any periods during which a continuous monitoring system or monitoring device is inoperative.  | 40 CFR Section 60.7(b)                                      |
| Recordkeeping: Keep on site at the source each of the following documents for a period of 5 years from the date the document is created: The certificate of representation, all emissions monitoring information, copies of all reports, compliance certifications, and other submissions or records made under the Acid Rain Program, copies of all documents used to complete an acid rain permit application. | 40 CFR Section 72.9(f)(l)                                   |
| Recordkeeping: Maintain records of all CEMS/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. 7007.0800, subp. 5                                 |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

Subject Item: EU 001 Boiler 1

Associated Items: SV 001

| What to do   | Why to do it  |
|--|---|
| Total Particulate Matter: less than or equal to 0.01 lbs/million BTU heat input based on a 24-hour average   | Title I Conditions: PSD Permit Application and impacts analysis |
| Opacity: less than or equal to 20 percent opacity except up to 60% opacity for four minutes in any 60-minute period and up to 40% opacity for four additional minutes in any 60-minute period  | Minn. R. 7011.0510, subp. 2                                     |
| Sulfur Dioxide: less than or equal to 0.24 lbs/million BTU heat input on a one-hour average  | Title I Conditions: PSD Permit Application and impacts analysis |
| Nitrogen Dioxide: less than or equal to 0.49 lbs/million BTU heat input on a 30-day rolling average  | Title I Conditions: PSD Permit Application and impacts analysis |
| Carbon Monoxide: less than or equal to 0.04 lbs/million BTU heat input on a one-hour average   | Title I Conditions: PSD Permit Application and impacts analysis |
| Fuel limited to No. 2 Fuel oil only, except natural gas may be used as necessary for initial firing only.  | Title I Conditions: PSD Permit Application and impacts analysis |
| No. 2 fuel oil shall have a minimum heating value of 136,598 Btu per gallon.   | Title I Conditions: PSD Permit Application and impacts analysis |
| No. 2 fuel oil shall have a maximum ash content of 0.00141 lbs ash per gallon.   | Title I Conditions: PSD Permit Application and impacts analysis |
| No. 2 fuel oil shall have a maximum sulfur content of 0.23% by weight.   | Title I Conditions: PSD Permit Application and impacts analysis |
| The Permittee shall maintain records of No. 2 fuel oil sampling results or vendor certifications, for a minimum of 5 years.  | Title I Condition: PSD permit application and impacts analysis  |
| Collect and analyze a fuel oil sample from each delivery of fuel oil, or shall obtain and keep copies of vendor certifications from each delivery. The information from the vendor certification or analysis must give the fuel oil sulfur content, ash content, and heating value for the purposes of demonstrating compliance with the sulfur dioxide emission limit, the sulfur content limit, the ash content limit, and the minimum heating value limit. All analyses shall be completed no later than 30 days after the sampling date. Samples shall be collected from the fuel oil prior to the oil being placed in the storage tank. The sample shall be analyzed for sulfur wt%, heating value in Btu/lb, density in lb/gal, and ash content in wt%, following ASTM methods D-1552, D-240, D-1481, and D-482, respectively, or equivalent methods approved by the Commissioner. | Title I Condition: PSD permit application and impacts analysis  |
| Notify: due 30 days after Startup . Written notification of startup is required to trigger the Initial Performance Test for Boiler No. 1.  | Minn. R. 7007.0800, subp. 2                                     |
| Initial Performance Test: due 180 days after Startup to determine compliance with the particulate matter, opacity, nitrogen oxides and carbon monoxide emission limits based on PSD modeling. Compliance shall be determined based on the average of three runs per Minn. R. 7017.2020, subp. 5.   | Minn. R. 7017.2020, subp. 1                                     |
| Performance Test Pre-test Meeting: due 7 days before Initial Performance Test  | Minn. R. 7017.2030, subp. 4                                     |
| Boiler Alternative Operating Conditions for Performance Testing:<br><br>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.<br><br>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.                         |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

|  |                                |
|--|--------------------------------|
| <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    |
| <p>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.</p>  | Minn. R. 7017.2020, subp. 4    |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

Subject Item: EU 002 Boiler 2

Associated Items: SV 001

| What to do   | Why to do it  |
|--|---|
| Total Particulate Matter: less than or equal to 0.01 lbs/million BTU heat input based on a 24-hour average   | Title I Conditions: PSD Permit Application and impacts analysis |
| Opacity: less than or equal to 20 percent opacity except up to 60% opacity for four minutes in any 60-minute period and up to 40% opacity for four additional minutes in any 60-minute period  | Minn. R. 7011.0510, subp. 2                                     |
| Sulfur Dioxide: less than or equal to 0.24 lbs/million BTU heat input on a one-hour average  | Title I Conditions: PSD Permit Application and impacts analysis |
| Nitrogen Dioxide: less than or equal to 0.49 lbs/million BTU heat input on a 30-day rolling average  | Title I Conditions: PSD Permit Application and impacts analysis |
| Carbon Monoxide: less than or equal to 0.04 lbs/million BTU heat input on a one-hour average   | Title I Conditions: PSD Permit Application and impacts analysis |
| Fuel limited to No. 2 Fuel oil only, except natural gas may be used as necessary for initial firing only.  | Title I Conditions: PSD Permit Application and impacts analysis |
| No. 2 fuel oil shall have a minimum heating value of 136,598 Btu per gallon.   | Title I Conditions: PSD Permit Application and impacts analysis |
| No. 2 fuel oil shall have a maximum ash content of 0.00141 lbs ash per gallon.   | Title I Conditions: PSD Permit Application and impacts analysis |
| No. 2 fuel oil shall have a maximum sulfur content of 0.23% by weight.   | Title I Conditions: PSD Permit Application and impacts analysis |
| The Permittee shall maintain records of No. 2 fuel oil sampling results or vendor certifications, for a minimum of 5 years.  | Title I Condition: PSD permit application and impacts analysis  |
| Collect and analyze a fuel oil sample from each delivery of fuel oil, or shall obtain and keep copies of vendor certifications from each delivery. The information from the vendor certification or analysis must give the fuel oil sulfur content, ash content, and heating value for the purposes of demonstrating compliance with the sulfur dioxide emission limit, the sulfur content limit, the ash content limit, and the minimum heating value limit. All analyses shall be completed no later than 30 days after the sampling date. Samples shall be collected from the fuel oil prior to the oil being placed in the storage tank. The sample shall be analyzed for sulfur wt%, heating value in Btu/lb, density in lb/gal, and ash content in wt%, following ASTM methods D-1552, D-240, D-1481, and D-482, respectively, or equivalent methods approved by the Commissioner. | Title I Condition: PSD permit application and impacts analysis  |
| Notify: due 30 days after Startup . Written notification of startup is required to trigger the Initial Performance Test for Boiler No. 2.  | Minn. R. 7007.0800, subp. 2                                     |
| Initial Performance Test: due 180 days after Startup to determine compliance with the particulate matter, opacity, nitrogen oxides and carbon monoxide emission limits based on PSD modeling. Compliance shall be determined based on the average of three runs per Minn. R. 7017.2020, subp. 5.   | Minn. R. 7017.2020, subp. 1                                     |
| Performance Test Pre-test Meeting: due 7 days before Initial Performance Test  | Minn. R. 7017.2030, subp. 4                                     |
| Boiler Alternative Operating Conditions for Performance Testing:<br><br>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.<br><br>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.                         |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

|  |                                |
|--|--------------------------------|
| <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    |
| <p>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.</p>  | Minn. R. 7017.2020, subp. 4    |

# TABLE A: LIMITS AND OTHER REQUIREMENTS

07/14/97

Facility Name: Minnesota Power & Light - ML Hibbard

Permit Number: 13700015 - 001

**Subject Item:** EU 003 Boiler 3 Cyclone & ESP

**Associated Items:** CE 001 Multiple Cyclone w/Fly Ash Reinjection-Common w/Coal Boilers

CE 002 Electrostatic Precipitator - High Efficiency

GP 001 Boilers 3 and 4

SV 001

| What to do   | Why to do it   |
|--|--|
| <p>Particulate Matter not to exceed <math>(0.025x + 0.027y)/(x+y)</math> lb/mmBtu based on a 24-hour average, where:</p> <p>x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu</p>  | <p>Title I Conditions: Limit to restrict potential emission increases to less than significant as defined by 40 CFR pt. 51 and 40 CFR Section 52.24. Also ensures compliance with 40 CFR Section 60.43b.</p> |
| <p>Opacity: less than or equal to 20 percent opacity using 6 Minute Average except for one 6-minute period per hour of not greater than 27% opacity.</p>   | <p>40 CFR Section 60.43b(f)</p>  |
| <p>Nitrogen Oxides not to exceed <math>(0.6x + 0.4y + 0.1z)/(x+y+z)</math> lb/mmBtu based on a 30 day rolling average, where:</p> <p>x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu<br/> z = heat input from natural gas in mmBtu</p> <p>Once each hour, the Permittee shall use the NOx emission limit equation to calculate the effective NOx emission limit.</p>   | <p>Title I Conditions: 40 CFR Section 52.21 BACT Limit; 40 CFR pt. 50. Also ensures compliance with 40 CFR Section 60.44b.</p>   |
| <p>Carbon Monoxide not to exceed <math>(0.35x + 0.45y + 0.04z)/(x+y+z)</math> lb/mmBtu based on a one-hour average, where:</p> <p>x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu<br/> z = heat input from natural gas in mmBtu</p>  | <p>Title I Conditions: 40 CFR Section 52.21 BACT Limit; 40 CFR pt. 50</p>  |
| <p>Sulfur Dioxide not to exceed <math>(2.03Sx + 0.17y)/(x+y)</math> lb/mmBtu based on a one hour averaging period, where:</p> <p>S = the allowed sulfur content in coal in percent by weight determined by fuel sampling and analysis (see the following requirement for more detail)<br/> x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu</p> <p>Once each hour, the Permittee shall use the SO2 emission limit equation to calculate the effective SO2 emission limit.</p> | <p>Title I Conditions: 40 CFR Section 52.21 BACT Limit; 40 CFR pt. 50. Also ensures compliance with 40 CFR Section 60.43(a)</p>  |
| <p>Limit of coal sulfur content (by weight):</p> <ul style="list-style-type: none"> <li>- 0.58% when burned alone or with natural gas or sludge,</li> <li>- may not exceed 0.9% at any time</li> <li>- When coal is being burned in combination with wood, the sulfur content limit shall vary as follows:</li> </ul> <p><math>S = 8.13 \times r^E</math></p> <p>S = allowable percent sulfur by weight<br/> r = coal feed rate in tons per hour.<br/> E = the exponent (-0.88) of "r"<br/> For use of this equation, r must be greater than or equal to 12. When r is less than 12, S = 0.9%.</p>                     | <p>Title I Conditions: PSD permit application and impacts analysis</p>   |
| <p>The Permittee shall only burn wood (including creosoted railroad ties), coal, natural gas, sludge from LSPI/SRFI clarifier, oily cellulose-based sorbents (including oily rags), oily coal and oily wood (coal or wood with oil spilled on it), boiler cleaning agents, and activated charcoal in EU003.</p>  | <p>Title I Conditions: PSD permit application and impacts analysis</p>   |

# TABLE A: LIMITS AND OTHER REQUIREMENTS

07/14/97

Facility Name: Minnesota Power & Light - ML Hibbard

Permit Number: 13700015 - 001

|   |   |
|---|---|
| <p>Boiler cleaning agents burn requirements: agents must be EDTA type or Ammonium Bromate, agents generated on-site, maximum of 5% of total fuel mass input, oxygen must be 3% or greater, and agents may be burned only while the boiler is operating at 75 percent of rated capacity or greater.</p> <p>During the initial burn (after issuance of this permit) in EU 003 of boiler cleaning agents, the Permittee shall monitor CO and opacity emissions to determine the compliance status of CO and opacity emissions during the burn. Monitoring results for the initial burn shall be submitted to the Agency. If compliance with the EU 003 CO and opacity limitations is shown, CO monitoring is not required during subsequent boiler cleaning agent combustion events.</p>   | Minn. R. 7007.0800, subp. 2                                     |
| <p>Fuel usage limits:</p> <ul style="list-style-type: none"> <li>- 22 tons per hour for coal;</li> <li>- 67 tons per hour for wood;</li> <li>- 0.305 MMCF per hour for natural gas.</li> </ul>  | Title I Conditions: PSD permit application and impacts analysis |
| <p>Fuel Sampling: The Permittee shall sample solid fuel as follows: Daily composite sampling for wood fuel and sample each coal delivery according to the Permittee's sampling plans approved by the MPCA on November 18, 1987 (except the need for a duplicate gross 240 pound sample is not required).</p>  | Title I Conditions: PSD permit application and impacts analysis |
| <p>Fuel Analysis: The Permittee shall analyze solid fuel samples using ASTM methods or equivalent methods approved by the Commissioner. Samples shall be analyzed for the following parameters:</p> <p>Coal: Sulfur content in wt. %, heating value in Btus per lb.<br/>Wood: Heating value in Btus per lb.</p> <p>The average heating value for natural gas may be obtained from the vendor.</p> <p>The Permittee shall maintain the records of all analyses for a period of 5 years from the date of recording.</p>   | Title I Conditions: PSD permit application and impacts analysis |
| <p>Maximum allowable heat input (based on 8-hour block averages):</p> <ul style="list-style-type: none"> <li>- 590 mmBtu/hour at any time</li> <li>- 380 mmBtu/hr from coal</li> <li>- 590 mmBtu/hr from wood</li> <li>- When wood fuel = 100% chipped railroad ties:<br/>maximum total heat input from all fuels = 326 mmBtu/hr,<br/>chipped railroad tie heat input shall not exceed 86% of total heat input, and<br/>coal heat input shall not be less than 14% of total heat input.</li> <li>- 305 mmBtu/hr from natural gas</li> </ul>   | Title I Conditions: PSD permit application and impacts analysis |
| <p>Total heat input shall be determined using the following equations:<br/>Total heat input to EU003 = x + y + z (not to exceed 590 mmBtu/hr)<br/>x = <math>380 - [(22-r) \times (17.2)]</math><br/>y = <math>590 - [(67-s) \times (8.8)]</math><br/>z = <math>305 - [(0.305-t) \times (1000)]</math><br/>x= heat derived from the burning of coal over any hour in mmBtu<br/>y= heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu<br/>z= heat derived from the burning of natural gas over any hour in mmBtu<br/>r = coal feed rate to boiler in tons per hour<br/>s = wood feed rate to boiler in tons per hour<br/>t = natural gas feed rate to boiler in million cubic feet per hour</p>  | Title I Conditions: PSD permit application and impacts analysis |
| <p>Monitoring and Recordkeeping for fuel usage and heat input:</p> <p>The Permittee shall record the usage rate of each solid fuel on a daily basis, and calculate and record the hourly average fuel use for each solid fuel by dividing the daily fuel use by the number of hours of operation for that day. The Permittee shall measure the natural gas usage rate, in million cubic feet per hour, using a fuel meter.</p> <p>The Permittee shall calculate and record the heat input during any hour from each fuel, as well as the total heat input for that hour.</p> <p>Heat content value of solid fuel shall be obtained from fuel sampling as required in this permit. Heat content value of natural gas shall be obtained from the natural gas vendor.</p> <p>The Permittee shall maintain all fuel usage and heat input records for five years from the date of recording.</p> | Title I Conditions: PSD permit application and impacts analysis |
| <p>Record type and usage rate of each fuel on a daily basis, and calculate the hourly average fuel use for each fuel type by dividing the daily fuel use by the number of hours of operation for that day. Records shall be maintained for a minimum of 5 years.</p>  | Title I Conditions: PSD permit application and impacts analysis |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

|   |   |
|---|---|
| Initial Performance Test: due 180 days after 12/31/01 to determine compliance with the Title I particulate matter and CO emissions limits while burning coal, wood chips (including railroad ties), sludge, or any combination thereof. Particulate emissions testing shall be conducted in accordance with the procedures in 40 CFR Section 60.46b(d) and Minn. R. 7017.2001 - 7017.2060 so that test results can also be used to determine compliance with 40 CFR Section 60.43b.   | Minn. R. 7017.2020, subp. 1             |
| Performance Test Pre-test Meeting: due 7 days before Initial Performance Test   | Minn. R. 7017.2030, subp. 4             |
| Performance Test: due before end of each 60 months following Initial Performance Test to determine compliance with Title I particulate matter and CO emissions limit while burning coal, wood chips (including railroad ties), sludge, or any combination thereof. Tests shall be conducted at intervals not to exceed 60 months between tests. Particulate emissions testing shall be conducted in accordance with the procedures in 40 CFR Section 60.46b(d) and Minn. R. 7017.2001 - 7017.2060 so that test results can also be used to determine compliance with 40 CFR Section 60.43b.   | Minn. R. 7017.2020, subp. 1             |
| Performance Test Pre-test Meeting: due 7 days before end of each 60 months following Performance Test (7 days before each Performance Test)   | Minn. R. 7017.2030, subp. 4             |
| Boiler Alternative Operating Conditions for Performance Testing:<br><br>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.<br><br>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:<br><br>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:<br><br>(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.<br><br>(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.<br><br>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:<br><br>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:<br><br>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.<br><br>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.<br><br>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             |
| The owner or operator of an affected facility (EU003) shall install, calibrate, maintain, and operate a continuous monitoring system for measuring and recording nitrogen oxides emissions.   | 40 CFR Section 60.48b(b)                |



**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

|   |                             |
|---|-----------------------------|
| The owner or operator of an affected facility (EU003) shall install, calibrate, maintain, and operate a continuous emission monitoring system for measuring and recording sulfur dioxide emissions. | 40 CFR Section 60.45(a)     |
| The owner or operator of an affected facility (EU003) shall install, calibrate, maintain and operate a continuous monitoring system for measuring and recording opacity emissions.                  | 40 CFR Section 60.48b(a)    |
| The Permittee shall use the data from the NOx CEM on SV001 to determine compliance with the NOx emission limit.   | 40 CFR Section 60.46b(e)(2) |
| The owner or operator shall measure opacity, and all SO <sub>2</sub> , NO <sub>x</sub> , and CO <sub>2</sub> emissions for each affect unit in accordance with 40 CFR Section 75.10.                | 40 CFR Section 75.10        |

# TABLE A: LIMITS AND OTHER REQUIREMENTS

07/14/97

Facility Name: Minnesota Power & Light - ML Hibbard

Permit Number: 13700015 - 001

**Subject Item:** EU 004 Boiler 4 Cyclone & ESP

**Associated Items:** CE 003 Multiple Cyclone w/Fly Ash Reinjection-Common w/Coal Boilers

CE 004 Electrostatic Precipitator - High Efficiency

GP 001 Boilers 3 and 4

SV 001

| What to do  | Why to do it  |
|---|---|
| <p>Particulate Matter not to exceed <math>(0.025x + 0.027y)/(x+y)</math> lb/mmBtu based on a 24-hour average, where:</p> <p>x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu</p>   | <p>Title I Condition: Limit to restrict potential emission increases to less than significant as defined by 40 CFR pt. 51 and 40 CFR Section 52.24. Also ensures compliance with 40 CFR Section 60.43b.</p> |
| <p>Opacity: less than or equal to 20 percent opacity using 6 Minute Average except for one 6-minute period per hour of not greater than 27% opacity.</p>  | <p>40 CFR Section 60.43b(f)</p>   |
| <p>Nitrogen Oxides not to exceed <math>(0.6x + 0.4y + 0.1z)/(x+y+z)</math> lb/mmBtu based on a 30 day rolling average, where:</p> <p>x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu<br/> z = heat input from natural gas in mmBtu</p> <p>Once each hour, the Permittee shall use the NOx emission limit equation to calculate the effective NOx emission limit.</p>  | <p>Title I Condition: 40 CFR Section 52.21 BACT Limit; 40 CFR pt. 50. Also ensures compliance with 40 CFR Section 60.44b.</p>   |
| <p>Carbon Monoxide not to exceed <math>(0.35x + 0.45y + 0.04z)/(x+y+z)</math> lb/mmBtu based on a one-hour average, where:</p> <p>x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu<br/> z = heat input from natural gas in mmBtu</p>   | <p>Title I Condition: 40 CFR Section 52.21 BACT Limit; 40 CFR pt. 50</p>  |
| <p>Sulfur Dioxide not to exceed <math>(2.03Sx + 0.17y)/(x+y)</math> lb/mmBtu based on a one hour averaging period, where:</p> <p>S = the allowed sulfur content in coal in percent by weight determined by fuel sampling and analysis (see the following requirement for more detail).<br/> x = heat derived from the burning of coal over any hour in mmBtu<br/> y = heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu</p> <p>Once each hour, the Permittee shall use the SO2 emission limit equation to calculate the effective SO2 emission limit.</p> | <p>Title I Condition: 40 CFR Section 52.21 BACT Limit; 40 CFR pt. 50. Also ensures compliance with 40 CFR Section 60.43(a)</p>  |
| <p>Limit of coal sulfur content (by weight):</p> <ul style="list-style-type: none"> <li>- 0.58% when burned alone or with natural gas or sludge,</li> <li>- may not exceed 0.9% at any time</li> <li>- When coal is being burned in combination with wood, the sulfur content limit shall vary as follows:</li> </ul> <p><math>S = 8.13 \times r^E</math></p> <p>S = allowable percent sulfur by weight<br/> r = coal feed rate in tons per hour.<br/> E = the exponent (-0.88) of "r"<br/> For use of this equation, r must be greater than or equal to 12. When r is less than 12, S = 0.9%.</p>                      | <p>Title I Conditions: PSD permit application and impacts analysis</p>  |
| <p>The Permittee shall only burn wood (including creosoted railroad ties), coal, natural gas, sludge from LSPI/SRFI clarifier, oily cellulose-based sorbents (including oily rags), oily coal and oily wood (coal or wood with oil spilled on it), boiler cleaning agents, and activated charcoal in EU004.</p>   | <p>Title I Conditions: PSD permit application and impacts analysis</p>  |

# TABLE A: LIMITS AND OTHER REQUIREMENTS

07/14/97

Facility Name: Minnesota Power & Light - ML Hibbard

Permit Number: 13700015 - 001

|   |   |
|---|---|
| <p>Boiler cleaning agents burn requirements: agents must be EDTA type or Ammonium Bromate, agents generated on-site, maximum of 5% of total fuel mass input, oxygen must be 3% or greater, and agents may be burned only while the boiler is operating at 75 percent of rated capacity or greater.</p> <p>During the initial burn (after issuance of this permit) in EU 004 of boiler cleaning agents, the Permittee shall monitor CO and opacity emissions to determine the compliance status of CO and opacity emissions during the burn. Monitoring results for the initial burn shall be submitted to the Agency. If compliance with the EU 004 CO and opacity limitations is shown, CO monitoring is not required during subsequent boiler cleaning agent combustion events.</p>   | Minn. R. 7007.0800, subp. 2                                     |
| <p>Fuel usage rate limits:</p> <ul style="list-style-type: none"> <li>- 22 tons per hour for coal;</li> <li>- 67 tons per hour for wood;</li> <li>- 0.305 MMCF per hour for natural gas.</li> </ul>   | Title I Conditions: PSD permit application and impacts analysis |
| <p>Fuel Sampling: The Permittee shall sample solid fuel as follows: Daily composite sampling for wood fuel and sample each coal delivery according to the Permittee's sampling plans approved by the MPCA on November 18, 1987 (except the need for a duplicate gross 240 pound sample is not required).</p>  | Minn. R. 7007.0800, subp. 2 and subp. 4                         |
| <p>Fuel Analysis: The Permittee shall analyze solid fuel samples using ASTM methods or equivalent methods approved by the Commissioner. Samples shall be analyzed for the following parameters:</p> <p>Coal: Sulfur content in wt. %, heating value in Btus per lb.<br/>Wood: Heating value in Btus per lb.</p> <p>The average heating value for natural gas may be obtained from the vendor.</p> <p>The Permittee shall maintain the records of all analyses for a period of 5 years from the date of recording.</p>   | Minn. R. 7007.0800, subp. 2 and subp. 4                         |
| <p>Maximum allowable heat input (based on 8-hour block averages):</p> <ul style="list-style-type: none"> <li>- 590 mmBtu/hour at any time</li> <li>- 380 mmBtu/hr from coal</li> <li>- 590 mmBtu/hr from wood</li> <li>- When wood fuel = 100% chipped railroad ties:<br/>maximum total heat input from all fuels = 326 mmBtu/hr,<br/>chipped railroad tie heat input shall not exceed 86% of total heat input, and<br/>coal heat input shall not be less than 14% of total heat input.</li> <li>- 305 mmBtu/hr from natural gas</li> </ul>   | Title I Conditions: PSD permit application and impacts analysis |
| <p>Total heat input shall be determined using the following equations:<br/>Total heat input to EU003 = x + y + z (not to exceed 590 mmBtu/hr)<br/>x = 380 - [(22-r) X (17.2)]<br/>y = 590 - [(67-s) X (8.8)]<br/>z = 305 - [(0.305-t) X (1000)]<br/>x= heat derived from the burning of coal over any hour in mmBtu<br/>y= heat derived from the burning of wood and wood waste portion of sludge and railroad ties over any hour in mmBtu<br/>z= heat derived from the burning of natural gas over any hour in mmBtu<br/>r = coal feed rate to boiler in tons per hour<br/>s = wood feed rate to boiler in tons per hour<br/>t = natural gas feed rate to boiler in million cubic feet per hour</p>  | Title I Conditions: PSD permit application and impacts analysis |
| <p>Monitoring and Recordkeeping for fuel usage and heat input:</p> <p>The Permittee shall record the usage rate of each solid fuel on a daily basis, and calculate and record the hourly average fuel use for each solid fuel by dividing the daily fuel use by the number of hours of operation for that day. The Permittee shall measure the natural gas usage rate, in million cubic feet per hour, using a fuel meter.</p> <p>The Permittee shall calculate and record the heat input during any hour from each fuel, as well as the total heat input for that hour.</p> <p>Heat content value of solid fuel shall be obtained from fuel sampling as required in this permit. Heat content value of natural gas shall be obtained from the natural gas vendor.</p> <p>The Permittee shall maintain all fuel usage and heat input records for five years from the date of recording.</p> | Title I Conditions: PSD permit application and impacts analysis |
| <p>Record type and usage rate of each fuel on a daily basis, and calculate the hourly average fuel use for each fuel type by dividing the daily fuel use by the number of hours of operation for that day. Records shall be maintained for a minimum of 5 years.</p>  | Title I Conditions: PSD permit application and impacts analysis |

# TABLE A: LIMITS AND OTHER REQUIREMENTS

07/14/97

Facility Name: Minnesota Power & Light - ML Hibbard

Permit Number: 13700015 - 001

|   |   |
|---|---|
| Initial Performance Test: due 180 days after 12/31/01 to determine compliance with the Title I particulate matter and CO emissions limit while burning coal, wood chips (including railroad ties), sludge, or any combination thereof. Particulate testing shall be conducted in accordance with the procedures in 40 CFR 60.46b(d) and Minn. R. 7017.2001 - 7017.2060 so that test results can also be used to determine compliance with 40 Section CFR 60.43b.  | Minn. R. 7017.2020, subp. 1             |
| Performance Test Pre-test Meeting: due 7 days before Initial Performance Test   | Minn. R. 7017.2030, subp. 4             |
| Performance Test: due before end of each 60 months following Initial Performance Test to determine compliance with Title I particulate matter and CO emissions limit while burning coal, wood chips (including railroad ties), sludge, or any combination thereof. Tests shall be conducted at intervals not to exceed 60 months between tests. Particulate testing shall be conducted in accordance with the procedures in 40 Section CFR 60.46b(d) and Minn. R. 7017.2001 - 7017.2060 so that test results can also be used to determine compliance with 40 CFR 60.43b.   | Minn. R. 7017.2020, subp. 1             |
| Performance Test Pre-test Meeting: due 7 days before end of each 60 months following Performance Test (7 days before each Performance Test)   | Minn. R. 7017.2030, subp. 4             |
| Boiler Alternative Operating Conditions for Performance Testing:<br><br>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.<br><br>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:<br><br>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:<br><br>(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.<br><br>(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.<br><br>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:<br><br>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:<br><br>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.<br><br>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.<br><br>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             |
| The owner or operator of an affected facility (EU004) shall install, calibrate, maintain, and operate a continuous emission monitoring system for measuring and recording sulfur dioxide emissions.   | 40 CFR Section 60.45(a)                 |
| The owner or operator of an affected facility (EU004) shall install, calibrate, maintain, and operate a continuous monitoring system for measuring and recording nitrogen oxides emissions.   | 40 CFR Section 60.48b(b)                |

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

|   |                             |
|---|-----------------------------|
| The owner or operator of an affected facility (EU004) shall install, calibrate, maintain and operate a continuous monitoring system for measuring and recording opacity emissions.  | 40 CFR Section 60.48b(a)    |
| The Permittee shall use the data from the NOx CEM on SV001 to determine compliance with the NOx emission limit.   | 40 CFR Section 60.46b(e)(2) |
| The owner or operator shall measure opacity, and all SO <sub>2</sub> , NO <sub>x</sub> , and CO <sub>2</sub> emissions for each affect unit in accordance with 40 CFR Section 75.10 | 40 CFR Section 75.10        |

## TABLE B: SUBMITTALS

07/14/97

Facility Name: Minnesota Power & Light - ML Hibbard  
Permit Number: 13700015 - 001

Table B lists the submittals you must send to the Commissioner. Table B is divided into two sections, for source-specific submittal requirements and for submittals required of all permittees. Source-specific submittals are further organized as either one-time only or recurrent requirements. You may also be subject to additional reporting requirements contained in the compliance schedule located in Table C of this permit. All submittals must be postmarked or received by the date specified in the table, and certified by a responsible official, defined in Minn. R. 7007.0100, subp. 21. Submittals which must be provided on standardized forms approved by the Commissioner are noted in Tables B and C.

Send any application for a permit or permit amendment to: Permit Information Coordinator, Permit Section, Air Quality Division, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4914. Also send the Permit Information Coordinator notices of: accumulated insignificant activities, installation of control equipment, replacement of an emissions unit, and changes that contravene a permit term.

Send all other submittals to: Compliance Tracking Coordinator, Compliance Determination Unit, Air Quality Division, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194.

**TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

| 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 1,095 days after Permit Issuance for PM-10, SO <sub>2</sub> , or NO <sub>x</sub> if potential emissions from your facility are in excess of 100 tons per year. The protocol will describe the proposed modeling methodology and input data in accordance with all requirements of 40 CFR pt. 51, App W. The protocol may be based on proposed operating conditions under the next permit term.                                    | Total Facility               |
| Computer Dispersion Modeling Results             | due 1,462 days after Permit Issuance  | Total Facility               |
| Fugitive Control Plan                            | due 60 days after Permit Issuance . The plan shall identify all fugitive emission sources, primary and contingent control measures, and the records to be kept to demonstrate that the plan is implemented.   | Total Facility               |
| Performance Test Notification (written)          | due 30 days before Initial Performance Test   | EU001, EU002, EU003, EU004   |
| Performance Test Plan                            | due 30 days before Initial Performance Test   | EU001, EU002, EU003, EU004   |
| Performance Test Report - Microfiche Copy        | due 105 days after Initial Performance Test   | EU001, EU002, EU003, EU004   |
| Performance Test Report                          | due 45 days after Initial Performance Test  | EU001, EU002, EU003, EU004   |
| Relative Accuracy Test Audit (RATA) Notification | due 30 days before CEMS Relative Accuracy Test Audit (RATA) .   | GP001                        |
| Testing Frequency Plan                           | due 60 days after Initial Performance Test for particulate matter, nitrogen oxide, opacity and carbon monoxide emission limits required by PSD modeling. The plan shall specify a testing frequency using the test data based on MPCA guidance. Future performance tests based on year (12 month), 36 month, and 60 month intervals, or as applicable, shall be required on written approval of MPCA per Minn. R. 7017.2020, subp. 1. | EU001, EU002                 |

**TABLE B: RECURRENT SUBMITTALS**

07/14/97

Facility Name: Minnesota Power &amp; Light - ML Hibbard

Permit Number: 13700015 - 001

| 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 Permit Issuance (Submit Deviations Reporting Form DRF-1). The EER shall indicate all periods of exceedances of the limit including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions.  | GP001                        |
| Linearity Test Results Summary                      | due 30 days after end of each calendar quarter following Linearity and Leak Check Test (Acid Rain Program) if performed.   | GP001                        |
| Relative Accuracy Test Audit (RATA) Results Summary | due 30 days after end of each calendar quarter following CEMS Relative Accuracy Test Audit (RATA) .  | GP001                        |
| COMS Calibration Error Audit Results Summary        | due 30 days after end of each calendar half-year following COMS Calibration Error Audit .  | GP001                        |
| Semiannual Deviations Report                        | due 30 days after end of each calendar half-year following Permit Issuance . A mid-year report, covering deviations which occurred during the period from January 1 through June 30, is due by July 30 of each year. An end-of-year report, covering deviations which occurred during the period from July 1 through December 31, is due by January 30 of each year. The report must be submitted even if there were no deviations for the reporting period. To be submitted on a form approved by the Commissioner. | Total Facility               |
| Compliance Certification                            | due 30 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.  | Total Facility               |
| Emissions Inventory Report                          | due 91 days after end of each calendar year following Permit Issuance (April 1st). To be submitted on a form approved by the Commissioner.   | Total Facility               |
| Performance Test Notification (written)             | due 30 days before end of each 60 months following Initial Performance Test (30 days before each Performance Test)   | EU003, EU004                 |
| Performance Test Plan                               | due 30 days before end of each 60 months following Initial Performance Test (30 days before each Performance Test)   | EU003, EU004                 |
| Performance Test Report - Microfiche Copy           | due 105 days after end of each 60 months following Initial Performance Test (105 days after each Performance Test)   | EU003                        |
| Performance Test Report - Microfiche Copy           | due 105 days after end of each 60 months following Initial Performance Test (105 days after each Performance Test)   | EU004                        |
| Performance Test Report                             | due 45 days after end of each 60 months following Initial Performance Test (45 days after each Performance Test)   | EU003                        |
| Performance Test Report                             | due 45 days after end of each 60 months following Initial Performance Test (45 days after each Performance Test)   | EU004                        |



**TECHNICAL SUPPORT DOCUMENT**  
**For**  
**AIR EMISSION PERMIT NO. 13700015-001**

This Technical Support Document (TSD) is for all the interested parties of the draft permit and to meet the requirements that have been set forth by the federal regulations and Minnesota Rules (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 draft permit.

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- 1.1 Applicant and Stationary Source Location
- 1.2 Description of the Permit Action
- 1.3 Emissions of the Facility

**2. Applicable Rules**

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- 2.2 Federal New Source Performance Standards
- 2.3 Acid Rain Program
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- 2.5 National Emission Standards for Hazardous Air Pollutants
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**4. Conclusion**

**1. General Information**

- 1.1. Applicant and Stationary Source Location:

| <b>Applicant/Address</b>  | <b>Stationary Source/Address<br/>(SIC Code: 4911)</b>               |
|---|---|
| Minnesota Power and Light<br>30 West Superior Street<br>Duluth, Minnesota 55802 | ML Hibbard<br>50th Avenue West and Main Street<br>Duluth, Minnesota |

## 1.2. Description Of The Permit Action

The emission units at the source consist of two oil fired, and two coal/wood/sludge/gas fired boilers. The plant provides steam to the neighboring Lake Superior Paper Industries plant, and can also generate electricity. Boilers 1 and 2, while permitted to operate, are not in use at this time.

This is a reissuance of an existing permit, and the issuance of the air emissions operating permit required by Title V of the Clean Air Act Amendments of 1990, codified in 40 CFR pt. 70. Previously the facility operated under a state only total facility air emission permit issued by the Minnesota Pollution Control Agency (MPCA). The last total facility permit was issued on June 24, 1986. The construction authorized by the 1986, permit commenced prior to June 19, 1986, but after June 19, 1984. That permit expired in 1991, and since the expiration, Minnesota Power has operated the plant under the conditions of the expired permit as is required by Minn. R. 7001.0160, Continuation of Expired Permit.

Since the last permit was issued in 1986, Amendment No. 1, was issued that made a correction to the coal sulfur limit, Amendment No. 2, was issued that made corrections to the opacity limits, Nitrogen Oxides (NO<sub>x</sub>) limits, and made changes to the monitoring and testing language and requirements, Air Emission Permit No. 73A-93-I/O-1, was issued that allowed for the burning of a limited amount of contaminated soil, and Air Emission Permit No. 73A-93-I/O-2, was issued that added chipped railroad ties as a permitted fuel type.

Most of the operating conditions of the permit will remain the same as in the existing operating permit, and amendments. Some changes have been made. Changes that have been made include more detailed specifications for operation of pollution control equipment, and more detailed specifications for operation and maintenance of flue gas monitoring equipment. The permit also meets the requirements of Minn. R. 7007.0800, that specifies requirements for the content of Part 70 permits.

The application for issuance of the Part 70 total facility operating permit was received September 15, 1995.

## 1.3. Emissions of the Facility

### 1.3.1 Criteria Pollutants

Following is a summary of the potential emission rates, in tons per year (tpy), attributable to the facility. Emission calculations are in the appendices.

**Table 1. Total Facility Potential to Emit Summary and Attainment Status:**

| <b>Pollutant</b>   | <b>Potential to Emit*<br/>(Tons/year)</b> | <b>Actual Emissions<br/>(Tons/year)</b> | <b>Attainment or Unclassified?<br/>(Yes or No)</b> |
|--|---|---|--|
| Particulate Matter less than 10 micron (PM <sub>10</sub> ) | 227                                       | 26                                      | Yes  |
| Sulfur Dioxide (SO <sub>2</sub> )                          | 7,151                                     | 136                                     | Yes  |
| Nitrogen Oxides (NO <sub>x</sub> )                         | 4,513                                     | 383                                     | Yes  |
| Carbon Monoxide (CO)                                       | 2,504                                     | 439                                     | Yes  |
| Lead   | 2.6                                       | 0.02                                    | Yes  |
| Volatile Organic Compounds                                 | 828                                       | 133                                     | NA   |
| Combined HAPs  | 31.6                                      | 4.2                                     | NA   |

\*Potential emissions based on permit limits

**Table 2. Facility Classification**

| <b>Classification<br/>(put x in appropriate box)</b> | <b>Major</b> | <b>Synthetic<br/>Minor</b> | <b>Minor</b> | <b>N/A</b> |
|--|--------------|----------------------------|--------------|------------|
| Prevention of Significant Deterioration              | x            |                            |              |            |
| Non Attainment Area (SO <sub>2</sub> and CO)         |              |                            |              | x          |
| Operating Permit Program                             | x            |                            |              |            |

### 1.3.2 Hazardous Air Pollutants

No limits have been set in the permit for Hazardous Air Pollutants (HAP), and currently no ambient standards exist for HAPs. Section 112(n)(1)(A) of the Clean Air Act mandates that the U.S. Environmental Protection Agency (EPA) perform a study, to be presented in a report to congress, of the hazards to public health reasonably anticipated to occur as a result of emissions of the HAPs by fossil fuel-fired electric utility steam generating units. The report will include; an assessment of HAP emission factors and rates from fossil fuel fired utility boilers, consideration of control strategies, and a determination as to whether hazardous air pollutants emission control from these sources is warranted. The study is referred to as the "Utility HAP study." EPA has received many extensions to the deadline for submittal of this report. The report was originally due to Congress in November of 1993. The latest deadline was May 31, 1996, and was not met. In October of 1996, the interim draft report was finally submitted. This draft report did not contain information on HAP control techniques but another report due later this year will contain this information. The MPCA will amend any existing permit to be consistent with EPA'S rulemaking.

The Utility HAP study will develop more accurate emission factors for various boiler types for HAPs than exist now. Currently, emission factors that are available are not considered to be highly accurate. Nonetheless, Minnesota Power was required to estimate HAP emissions using available factors and submit those estimates with their Part 70 permit application. Those estimates are attached.

## **2. Applicable Rules**

### **2.1 Federal New Source Review**

The Hibbard Plant is in an attainment area for all pollutants, and so the applicable New Source Review (NSR) regulations are found under 40 CFR § 52.21 (Prevention of Significant Deterioration (PSD)). The facility is classified as a major source as defined in that rule. Two of the facility's boilers (Boilers 3 and 4) were modified during the 1980's and the modification was subject to PSD review for Sulfur Dioxide (SO<sub>2</sub>), Nitrogen Oxides (NO<sub>x</sub>), and Carbon Monoxide (CO). The modification was kept minor for Particulate Matter (PM) through emission limits set on all boilers, and for limits on coal handling at the facility. At the time of the modification, the plant's area was classified as non-attainment for PM, and so the limits were set to avoid non-attainment area review.

### **2.2 Federal New Source Performance Standards**

Power Boilers 1 and 2 were constructed prior to the effective date of New Source Performance Standards (NSPS). The modification of Boilers 3 and 4 subjected them to the requirements of 40 CFR pt. 60, subp. Db. However, note that 40 CFR § 60.40b(b)(2) specifies that Boilers 3 and 4 are subject to the PM and NO<sub>x</sub> standards under 40 CFR pt. 60, subp. Db, and to the SO<sub>2</sub> standards under 40 CFR pt. 60, subp. D.

### **2.3 Acid Rain Program**

Title IV of the Clean Air Act Amendments of 1990, requires electric utilities to substantially reduce emissions of SO<sub>2</sub> and NO<sub>x</sub>, the primary pollutants that contribute to acid rain. Through the requirement that utilities hold SO<sub>2</sub> allowances for each ton of SO<sub>2</sub> they emit, the EPA plans to cut annual national SO<sub>2</sub> emissions by about a factor of two. NO<sub>x</sub> emissions reductions will be controlled by emission limits set for each type of utility boiler, on a lb/mmBtu basis. EPA is in the process of developing rules that set the new emission limits.

The regulation takes effect in two phases. Phase I took effect in 1995, and Phase II will take effect in the year 2000. The Hibbard plant is not subject to Phase I, but will be subject to Phase II. As such, Minnesota Power will be required to hold allowances equal to the tons of SO<sub>2</sub> emissions from the plant after January 1, 2000. Those allowances and emissions will be tracked by EPA. Though emissions and compliance are the responsibility of EPA, the MPCA is required to issue a permit that summarizes the requirements of the regulation. Boilers 3 and 4 have those requirements associated with them in the permit as required by 40 CFR § 72.50. Boilers 1 and 2 are not subject to Title IV because their electrical production does not exceed 25 MW (greater than 25 MW is the trigger). Additionally, Minnesota Power will be required to meet NO<sub>x</sub> emission limits, set in lb/mmBtu for the boilers, on a system wide average. 40 CFR pt. 72 requires the MPCA to reopen the permit and add the NO<sub>x</sub> emission limits by January 1, 1999.

## 2.4 National and State Ambient Air Quality Standards (40 CFR pt. 50)

The National Ambient Air Quality Standards (NAAQS), as found in 40 CFR pt. 50, and the Minnesota Ambient Air Quality Standards (MAAQS), set the maximum concentration of pollutants allowed in the ambient air. As such, they apply to all air emissions sources. Computer dispersion modeling will be used to determine whether a facility is in compliance with these standards by predicting the maximum ambient concentrations of pollutants that will result from maximum facility operation. The permit contains requirements for computer dispersion modeling to be submitted four years from permit issuance. The Air Quality Division is requiring this modeling for all sources with potential emissions greater than 100 tons per year of Particulate Matter less than 10 um in size (PM<sub>10</sub>), SO<sub>2</sub>, or NO<sub>x</sub>. If that modeling shows that lower emission limits are needed to ensure compliance with ambient standards, the lower emission limits will be incorporated into the reissuance of the Title V permit. Minnesota Power has completed dispersion modeling as part of the PSD permit issuance for Boilers 3 and 4, and emission limits are included in the permit as a result of the modeling, but because newer models exist, the MPCA is asking that modeling be redone if the previous modeling was performed prior to 1988.

The permit contains many limits that were derived from the results of the computer dispersion modeling already performed. Those limits will remain in the permit. The modeling required by this permit may be used to develop different emission limits. If so, then the new limits will be incorporated into the reissuance of the permit.

## 2.5 National Emission Standards for Hazardous Air Pollutants

At this time, there are no promulgated or proposed standards for utility boilers.

## 2.6 State Performance Standards

Boilers 1 and 2 are subject to Minn. R. for Existing Indirect Heating Equipment Coal and ash handling equipment are subject to Minnesota Standards for Industrial Process Equipment. The coal and ash handling at the facility qualify as insignificant activities so the requirements for those are listed at the total facility level. Because the facility is located in Duluth, it is also subject to Standards for Certain Coal Handling Facilities, Minn. R. 7011.1105.

## 2.7 Environmental Assessment

No new construction or increases in emissions are allowed by this permit. Consequently, no environmental assessment is required.

## 2.8 Mercury Emissions

Coal-fired power plants emit mercury because it exists in trace quantities in coal. Mercury is an environmental problem because it is a neurotoxin and can concentrate in fish to the point that consumption of fish is hazardous. Virtually all mercury reaches lakes through air pollution, which is the result of many sources, some near and some far away. According to the 1994 MPCA report "Strategies for Reducing Mercury in Minnesota", coal-fired power plants constitute approximately 25 percent of the states man-made mercury emissions, excluding emissions from paint and fungicides (mercury is no longer used in these products). Municipal waste combustors are the second-largest category of mercury emitters, accounting for roughly 20 percent of the state's mercury emissions.

No regulations currently exist which require emissions control or set emission limits for coal-fired power plants. Mercury emission limits were recently promulgated for Municipal Waste Combustors (MWC). However, emissions from coal-fired power plants typically contain one-tenth the concentration of mercury found in exhaust gas from waste combustors (although the concentration of mercury in waste combustor emissions is decreasing as mercury use in products decreases). Therefore mercury control technology which is effective for a MWC is not necessarily transferable to a coal-fired power plant. Various groups, including the Electric Power Research Institute, are in the process of developing technology for reducing mercury emissions from coal combustion.

EPA is currently working on two studies which relate to mercury emissions: the Electric Utility HAPs study, and the Mercury study. Federal regulatory programs aimed at reducing mercury emissions from power plants may result from one or more of these EPA projects.

The MPCA Mercury Task Force is considering working on a state initiative to reduce mercury emissions. The proposed initiative would apply to all significant mercury sources, including coal-fired power plants. As of August, 1996, the Task Force is awaiting funding and soliciting input from interested parties to determine who would support development of a state or regional mercury strategy.

### **3. Requirements**

#### **3.1 Total Facility Requirements:**

All general requirements and some site specific conditions are listed at the total facility level. (See attached CD-01 forms for specific limits). Overall, the Permittee will be required to submit an annual report evaluating the compliance status of the facility for the past calendar year, and to report deviations from permit conditions each six months. The total facility requirements also include requirements for recordkeeping, inspection and entry, the requirements to submit an operation and maintenance plan, deviations notifications, application for amendment, the acid and alkaline fallout limits, requirements for procedures for notifications in the event of equipment shutdown/breakdown, and submittal of a fugitive emissions control plan. Also required is the performance and submittal of computer dispersion modeling (mentioned above) that show that the facility's operation will not result in concentrations of pollutants in the area surrounding the facility that exceed standards for particulate, SO<sub>2</sub> and NO<sub>x</sub>. Netting was performed when the modification of Boilers 3 and 4 was permitted, resulting, in part, in a total facility coal handling limit. That coal handling limit is included as a Title I condition in the total facility requirements also.

### 3.2 GP001 EU003 and EU004

*Applicable Regulations:* The boilers share monitors for SO<sub>2</sub>, NO<sub>x</sub>, CO, exhaust gas flow rate, and opacity. The monitors are used to fulfill requirements set forth in NSPS, 40 CFR pt. 60, and the acid rain program, 40 CFR pt. 75. Because the monitors are shared, the requirements are set at the common duct level, rather than the emission unit level. Note that 40 CFR § 60.13(g) allows common monitoring of emissions from sources (such as EU 003 and EU 004) that are subject to the same emission limit.



### 3.3 Boiler 1

Boiler 1 has a rated heat input of 527 mmBtu per hour. The main fuel is oil. The boiler has not been operated since the early 1970's.

*Applicable Regulations:* The boiler's emission limits are derived from Minnesota Performance Standards for Existing Indirect Heating Equipment, along with limits that were derived from the results of dispersion modeling conducted during the 1986, PSD review for NO<sub>2</sub>, CO, SO<sub>2</sub> and PM. The particulate limit also was used to ensure that significant increases of particulate would not occur, to avoid non-attainment area review for that pollutant.

*Fuel Use Limits:* Permitted fuel use was part of the PSD analysis, therefore the limits on fuel use are set as Title I conditions.

*Compliance Demonstration:* Since the boiler does not have a dedicated SO<sub>2</sub> monitor, the company is required to sample and analyze coal from each delivery of oil, or obtain analysis information or certifications from the vendor, and demonstrate compliance with the SO<sub>2</sub> limits using the sulfur content and heating value.

Performance testing is required for emissions of PM, NO<sub>x</sub>, and CO, if the boiler resumes operation, to demonstrate compliance with emission limits for those pollutants. The testing frequency will be chosen based on the results of the stack testing.

### 3.4 Boiler 2

Boiler 2 has a rated heat input of 490 mmBtu per hour. The main fuel is oil. The boiler has not been operated since the early 1970's.

*Applicable Regulations:* The boiler's emission limits are derived from Minnesota Performance Standards for Existing Indirect Heating Equipment, along with limits that were derived from the results of dispersion modeling conducted during the 1986, PSD review for NO<sub>2</sub> CO, SO<sub>2</sub> and PM. The particulate limit also was used to ensure that significant increases of particulate would not occur, resulting in non-attainment area review for that pollutant.

*Fuel Use Limits:* Permitted fuel use was part of the PSD analysis, therefore the limits on fuel use are set as Title I conditions.

*Compliance Demonstration:* Since the boiler does not have a dedicated SO<sub>2</sub> monitor, the company is required to sample and analyze coal from each delivery of oil, or obtain analysis information or certifications from the vendor, and demonstrate compliance with the SO<sub>2</sub> limits using the sulfur content and heating value.

Performance testing is required for emissions of PM, NO<sub>x</sub>, and CO, if the boiler resumes operation, to demonstrate compliance with emission limits for those pollutants. The testing frequency will be chosen based on the results of the stack testing.

### 3.5 Power Boiler 3

Boiler 3 has a rated input of 590 mmBtu per hour, and is a spreader stoker. Fuels are coal, wood, sludge, gas, and oil. Emissions are controlled with an electrostatic precipitator.

*Applicable Regulations:* The boiler is subject to NSPS (40 CFR pt. 60, subps. D and Db), and NSR (40 CFR § 52.21, PSD) for SO<sub>2</sub>, NO<sub>x</sub>, and CO. The PSD analysis resulted in emission limits, and limits on boiler operating capacity, as well as fuel input.

The boiler is also subject to the Acid Rain Program as discussed above in Part 2. Accordingly, Table A for the boiler contains requirements to follow the acid rain program, and to monitor emissions of SO<sub>2</sub>, Carbon Dioxide (CO<sub>2</sub>), NO<sub>x</sub>, and opacity. The boiler shares SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> monitors with Boiler 4, therefore, the QAQC requirements for the gaseous emission monitors are set at the duct level.

*Fuel Use Limits:* Fuel use limits are derived from the assumptions made in the PSD analysis.

*Compliance Demonstration:* Continuous monitoring is required for opacity, SO<sub>2</sub>, and NO<sub>x</sub>. The boiler does not have dedicated monitors, but 40 CFR § 60.13(g) allows common monitoring of emissions from sources (such as EU 003 and EU 004) that are subject to the same emission limit. As required by Subp. Db, the NO<sub>x</sub> monitoring is used to demonstrate compliance with the NO<sub>x</sub> emission limit. Emission limits are based on the fuel mix, so MP is required to track the fuel mix and calculate the effective emission limit.

Performance testing is required within 180 days of permit issuance and then every five years for PM and CO, the only unmonitored pollutants. The testing frequency was chosen because past stack testing has shown the pollutant emission rates are less than 60 percent of the applicable limit.

### 3.5 Power Boiler 4

Boiler 4 has a rated input of 590 mmBtu per hour, and is a spreader stoker. Fuels are coal, wood, sludge, gas and oil. Emissions are controlled with an electrostatic precipitator.

*Applicable Regulations:* The boiler is subject to NSPS (40 CFR 60, subps. D and Db), and NSR (40 CFR § 52.21, PSD) for SO<sub>2</sub>, NO<sub>x</sub>, and CO. The PSD analysis resulted in emission limits, and limits on boiler operating capacity, as well as fuel input.

The boiler is also subject to the Acid Rain Program as discussed above in Part 2. Accordingly, Table A for the boiler contains requirements to follow the acid rain program, and to monitor emissions of SO<sub>2</sub>, CO<sub>2</sub>, NO<sub>x</sub>, and opacity. The boiler shares SO<sub>2</sub>, NO<sub>x</sub>, and carbon dioxide monitors with Boiler 3, therefore, the QAQC requirements for the gaseous emission monitors are set at the duct level.

*Fuel Use Limits:* Fuel use limits are derived from the assumptions made in the PSD analysis.

*Compliance Demonstration:* Continuous monitoring is required for opacity, SO<sub>2</sub>, and NO<sub>x</sub>. The boiler does not have dedicated monitors, but 40 CFR § 60.13(g) allows common monitoring of emissions from sources (such as EU 003 and EU 004) that are subject to the same emission limit. As required by Subp. Db, the NO<sub>x</sub> monitoring is used to demonstrate compliance with the NO<sub>x</sub> emission limit. Emission limits are based on the fuel mix, so MP is required to track the fuel mix and calculate the effective emission limit.

Performance testing is required within 180 days of permit issuance and then every five years for PM and CO, the only unmonitored pollutants. The testing frequency was chosen because past stack testing has shown the pollutant emission rates are less than 60 percent of the applicable limit.

#### **4. Conclusion**

Based on the information provided by Minnesota Power Company, the MPCA has reasonable assurance that the continued operation of the emission facility, as described in the Air Emission Permit No. 13700015-001, and this technical support document; will not cause or contribute to a violation of Minnesota or Federal Air Pollution Rules.

#### **Attachments:**

1. Stack Test Frequency Justification
2. Criteria Pollutant and HAP Emission Calculations
3. Combustion of Activated Charcoal Analysis
4. May 26, 1989 letter from MP to EPA on NSPS applicability (D vs Db)

#### **Need further information?**

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# ATTACHMENT 1

## ATTACHMENT 2

## ATTACHMENT 3



# ATTACHMENT 4