AIR EMISSION PERMIT NO. 13700027- 003

IS ISSUED TO

Hibbing Public Utilities Commission
1832 6th Avenue East
Hibbing, St. Louis County, MN 557461660

And

Laurentian Energy Authority LLC
618 2nd Street South
Virginia, MN 55792

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

Permit Type	Application Date	Issuance Date	Action Number
Total Facility Operating Permit	09/13/1995	09/12/1997	001
Administrative Amendment	06/08/2000	01/04/2001	002
Major Amendment/Reissuance	09/31/2004	See below	003

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

Permit Type: Federal; Pt 70 Reissuance/NSR Authorization
40 CFR § 52.21 Construction Authorization Issue Date: June 30, 2005
40 CFR § 52.21 Construction Authorization Effective Date: June 30, 2005
40 CFR pt. 70 Operating Conditions Issuance Date: June 30, 2005
Expiration: June 30, 2010
Title I Conditions do not expire.

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

for Sheryl A. Corrigan
Commissioner
Minnesota Pollution Control Agency

TABLE OF CONTENTS

NOTICE TO THE PERMITTEE:

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

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

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

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

PERMIT SHIELD:

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

FACILITY DESCRIPTION:

The Hibbing Public Utilities Commission (HPUC) operates a co-generation facility for the city of Hibbing. The facility generates electrical power for the city and steam for space heating of businesses, schools, and residences. The HPUC power plant is located in downtown Hibbing and was originally constructed in 1919. The emission units at the source consist of three coal/natural gas-fired boilers, an ash-handling system, as well as the two natural gas-fired boilers located a few blocks away at Hibbing High School that are connected to the HPUC steam distribution system. The five boilers are labeled Boiler No. 1A, Boiler No. 2A, Boiler No. 3A, High School Boiler No. 1, and High School Boiler No. 2.

Boilers 1A, 2A, and 3A are spreader stoker units that can burn subbituminous coal, and bituminous coal. Boilers 1A and 2A can also burn natural gas. Boilers 1A, 2A, and 3A are each equipped with their own electrostatic precipitator (for particulate matter control) and exhaust stack. This permit allows the facility to also burn used oil and oily paper-based sorbents (including oily rags) in Boilers No. 1A, 2A, and 3A. The stacks for Boilers 1A and 2A will be combined into a taller stack prior to the startup of a new wood fired boiler.

The high school boilers combust only natural gas. The High School boilers were constructed in 1972 and connected at that time to the HPUC steam heating system. The HPUC became the sole operator of these units in 1982. However, the change of operator was not considered a modification under New Source Review. Currently these natural gas-fired boilers are only operated a few days per year for emergency back-up. The majority of the steam heat for the school is supplied by the main HPUC boilers.

Boilers No. 1A and 2A are rated at 207 mmBtus (million Btu) per hour (145,000 lbs. of steam per hour). Boiler No. 3A is rated at 243 mmBtus per hour (170,000 lbs. of steam per hour). These are the 2-hour peak input capacities. Maximum continuous ratings are for Boilers 1A and 2A, 178.7 mmBtus per hour (125,000 lbs. of steam per hour), and for Boiler 3A, 214.4 mmBtus per hour (150,000 lbs. of steam per hour.) The High School Boilers are both rated at 36 mmBtus per hour (30,000 lbs. of steam per hour). None of the five boilers are subject to New Source Performance Standards.

Boilers 1A, 2A, and 3A, are individually equipped with continuous emission monitors (CEMs), for opacity, sulfur dioxide, and oxygen. The High School Boilers do not have any CEMs.

There are three steam-driven electric generating turbines at the facility with a total production capacity of 38 Megawatts.

Other air emission sources at the facility include a railcar/truck coal unloading station and an ash transfer system. The coal unloading station is considered an insignificant activity but will be included in the facility's fugitive dust control plan.

In addition to being a reissuance of the total facility permit this permit authorizes the installation of a wood fired boiler to be used for district heating and electric generation. Also authorized with this permit action are the installation of wood handling and storage equipment, and ash handling equipment. This modification is subject to federal new source review.

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

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

Subject Item: Total Facility

What to do	Why to do it
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
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; Minn. R. 7007.0800, subp. 16(J)
Shutdown Notifications: Notify the Commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the owner or operator does not have advance knowledge of the shutdown, notification shall be made to the Commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 3. At the time of notification, the owner or operator shall inform the Commissioner of the cause of the shutdown and the estimated duration. The owner or operator shall notify the Commissioner when the shutdown is over. In addition, the notification for the Wood Fired Boiler is due by letter within 7 days of the shutdown if the shutdown was not consistent with the startup, shutdown and malfunction plan, and any applicable emission limitation was exceeded.	Minn. R. 7019.1000, subp. 3 and Table 9 to Subp. DDDDD of Part 63
Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 2. At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over. In addition, the notification for the Wood Fired Boiler is due by letter within 7 days of the breakdown if the breakdown was not consistent with the startup, shutdown and malfunction plan, and any applicable emission limitation was exceeded.	Minn. R. 7019.1000, subp. 2 and Table 9 to Subp. DDDDD of Part 63
Refer to the EU007 requirements table for additional reporting requirements when actions taken are not consistent with the procedures specified in the EU007 startup, shutdown, and malfunction plan, and EU007 exceeds an applicable emission limitation.	continued from above
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)
Operation of Monitoring Equipment: Unless otherwise noted in Tables A, B, and/or C, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system.	Minn. R. 7007.0800, subp. 4(D)
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

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A or B.	Minn. R. ch. 7017
Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as specified by Minn. R. 7017.2025 following formal review of a subsequent performance test on the same unit.	Minn. R. 7017.2025
Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment.	Minn. R. 7007.0800, subp. 6(A)
Notification of Deviations Endangering Human Health or the Environment Report: Within 2 working days of discovery, notify the Commissioner in writing of any deviation from permit conditions which could endanger human health or the environment. Include the following information in this written description: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.	Minn. R. 7007.0800, subp. 6(A)
Operation Changes: In any shutdown, breakdown, or deviation the Permittee shall immediately take all practical steps to modify operations to reduce the emission of any regulated air pollutant. The Commissioner may require feasible and practical modifications in the operation to reduce emissions of air pollutants. No emissions units that have an unreasonable shutdown or breakdown frequency of process or control equipment shall be permitted to operate.	Minn. R. 7019.1000, subp. 4
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
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)
Emissions Inventory Report: due 91 days after the end of each calendar year (April 1). To be submitted on a form approved by the Commissioner.	Minn. R. 7019.3000 through Minn. R. 7019.3010
Emission Fees: due 60 days after receipt of an MPCA bill.	Minn. R. 7002.0005 through Minn. R. 7002.0095
Inspections: The Permittee shall comply with the inspection procedures and requirements as found in Minn. R. 7007.0800, subp. 9(A).	Minn. R. 7007.0800, subp. 9(A)
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, 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)
Noise: The Permittee shall comply with noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during operation of any emission units. This is a state requirement only and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7030.0010-7030.0080
Performance Test (or Fuel Analyses for those pollutants not tested for) Notifications and Submittals; Performance Test Notification (written): due 30 days before each Performance Test for the existing boilers, due 60 days prior to testing for the wood fired boiler. Performance Test Plan: due 30 days before each Performance Test for the existing boilers, due 60 days prior to testing for the wood fired boiler. Performance Test Pre-Test Meeting: due 7 day before each Performance Test Performance Test Report: due 45 days after each Performance Test Performance Test Report - Microfiche Copy or CD: due 105 day after each Performance Test. The Notification, Test Plan, and Test Report may be submitted in alternative format as allowed by Minn. R. 7017.2018. For the Wood Fired Boiler, the Performance Test Report or Fuel Analysis Report must include the information in 40 CFR Section 63.7545(e).	Minn. R. 7017.2030, subp. 1-4; Minn. R. 7017.2018 and Minn. R. 7017.2035, subp. 1-2, 40 CFR Section 63.7(b)(1) and (2), 40 CFR Section 63.7545(e)

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Comply with Subp. DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters, as applicable, by September 13, 2007 for the existing boilers, Boilers 1A, 2A, 3A and the high school boilers, as applicable. Also comply with the applicable requirements of 40 CFR Part 63, Subp. A.	40 CFR Subp. DDDDD
AMBIENT STANDARDS	hdr
The Permittee shall comply and demonstrate compliance with National Primary and Secondary Ambient Air Quality Standards, 40 CFR pt. 50 and the Minnesota Ambient Air Quality Standards, Minn. R. 7009.0010 to 7009.0800.	40 CFR pt. 50; Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080.
Parameters Used in Modeling: The stack heights, emission rates, and other parameters used in the dispersion modeling are listed in the Appendix of this permit. The Permittee must submit to the Commissioner for approval any revisions of these parameters and must wait for a written approval before making such changes. The information submitted must include, at a minimum, the locations, heights and diameters of the stacks, locations and dimensions of nearby buildings, the velocity and temperatures of the gases emitted, and the emission rates. The plume dispersion charateristics due to the revisions of the information must be equivalent to or better than the dispersion charateristics modeled. The Permittee shall demonstrate this equivalency in the proposal. If the information does not demonstrate equivalent or better dispersion characteristics, or if a conclusion cannot readily be made about the dispersion, the Permittee must remodel.	Title I Condition: 40 CFR Section 52.21(k); Minn. R. 7007.3000, 40 CFR Part 50, and Minn. R. 7009
For changes that do not involve an increase in an emission rate and that do not require a permit amendment, this proposal must be submitted as soon as practicable, but no less than 60 days before beginning actual construction of the stack or associated emission unit. For changes involving increases in emission rates and that require a minor permit amendment, the proposal must be submitted as soon as practicable, but no less than 60 days before beginning actual construction of the stack or associated emission unit. For changes involving increases in emission rates and that require a permit amendment other than a minor amendment, the proposal must be submitted with the permit applicaiton.	Title I Condition: 40 CFR Section 52.21(k); Minn. R. 7007.3000, 40 CFR Part 50, and Minn. R. 7009

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **GP 001 Boilers 1A, 2A, and 3A**

Associated Items: EU 001 Boiler No. 1A

EU 002 Boiler No. 2A

EU 003 Boiler No. 3A

What to do	Why to do it
Sulfur Dioxide: less than or equal to 2.06 lbs/million Btu heat input using 1-Hour Average basis when only two of the three boilers in GP 001 are operating. The limit individually applies to each boiler and applies until the startup of the wood fired boiler. See the requirements table under EU001, EU002, and EU003 for sulfur dioxide limits that apply after the startup of the wood fired boiler.	Minn. R. 7009.0020 to not cause or contribute to a violation of the sulfur doxide ambient air standard in Minn. R. 7009.0080
Sulfur Dioxide: less than or equal to 1.58 lbs/million Btu heat input using 1-Hour Average basis when all three boilers in GP 001 are operating. The limit individually applies to each boiler and applies until the startup of the wood fired boiler. See the requirements table under EU001, EU002, and EU003 for sulfur dioxide limits that apply after the startup of the wood fired boiler.	Minn. R. 7009.0020 to not cause or contribute to a violation of the sulfur doxide ambient air standard in Minn. R. 7009.0080
Fuel Usage Limit: The Permittee shall not combust more than a total of 500 pounds per year of oily cellulose-based sorbents (oily rags) in the emission units in GP 001. Each day that oily cellulose-based sorbents (oily rags) are burned in one of the boilers, record the amount burned. By the 15th of each month, calculate the amount of cellulose-based sorbents (oily rags) that were burned in the preceding 12 months.	Minn. R. 7007.0800, subp. 2
Fuel Usage Limit: The Permittee shall limit the total used oil combusted in the emission units in GP 001 to 5,000 gallons per year. The Permittee shall limit combustion of used oil to 5% of total heat input on an hourly basis in each emission unit, and as follows: EU 001: 77 gallons per hour EU 002: 77 gallons per hour EU 003: 86 gallons per hour Each day that used oil is burned in one of the boilers, record the amount burned. By the 15th of each month, calculate the amount of used oil that was burned in the preceding 12 months.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **GP 002 Material Handling Baghouses**

Associated Items: CE 004 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 008 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 009 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 010 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 011 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 012 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 013 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 014 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

What to do	Why to do it
No visible emissions allowed.	Title I Condition: to ensure compliance with PM10 BACT limit
Visible Emissions: The Permittee shall check the fabric filter stacks for any visible emissions once each day of operation during daylight hours. For days in which inclement weather prohibits a visible emissions check, the Permittee shall read and record the pressure drop across the fabric filter, once each day of operation.	Title I Condition: to ensure compliance with PM10 BACT limit
Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit. CE004 Pressure Drop Range: CE008 Pressure Drop Range: CE009 Pressure Drop Range: CE010 Pressure Drop Range: CE011 Pressure Drop Range: CE012 Pressure Drop Range: CE013 Pressure Drop Range: CE014 Pressure Drop Range: The pressure drop range for each baghouse shall be submitted, along with an application for a major amendment, once a vendor is chosen. The manufacturer's information must be submitted with the application.	Title I Condition: to ensure compliance with PM10 BACT limit
The Permittee shall operate and maintain the fabric filter at all times that any emission unit controlled by the fabric filter is in operation. The Permittee shall document periods of non-operation of the control equipment when the emission unit is in operation.	Minn. R. 7007.0800, subp. 2 and 14
Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur: - visible emissions are observed; - the recorded pressure drop is outside the required operating range; or - the fabric filter or any of its components are found during the inspections to need repair. Corrective actions shall return the pressure drop to within the permitted range, eliminate visible emissions, and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the fabric filter. The Permittee shall keep a record of the type and date of any corrective action taken for each filter.	Minn. R. 7007.0800, subp. 4, 5, and 14
Monitoring Equipment: The Permittee shall install and maintain the necessary monitoring equipment for measuring and recording pressure drop as required by this permit. The monitoring equipment must be installed, in use, and properly maintained when the monitored fabric filter is in operation.	Minn. R. 7007.0800, subp. 4
Periodic Inspections: At least once per calendar quarter, or more frequently as required by the manufacturing specifications, the Permittee shall inspect the control equipment components. The Permittee shall maintain a written record of these inspections.	Minn. R. 7007.0800, subp. 4, 5 and 14
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14
PERFORMANCE TESTING	hdr
Initial Performance Test: due 180 days after Initial Startup of the wood fired boiler. Testing shall be performed for PM10 from one of the material handling baghouses with the highest calculated input grain loading.	Title I Condition: to determine compliance with PM10 BACT limit

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **GP 003 Wood Boiler Continuous Monitors**

Associated Items: MR 011

MR 012

MR 013

What to do	Why to do it
Installation Notification: due 60 days before installing the continuous emissions monitoring system. The notification shall include plans and drawings of the system.	Minn. R. 7017.1040, subp. 1
All continuous monitoring systems and monitoring devices shall be installed and operational prior to conducting performance tests. Verification of operational status shall, as a minimum, include completion of the manufacturer's written requirements or recommendations for installation, operation, and calibration of the device.	40 CFR 60.13(b)
CEM Certification Test: due 60 days after achieving maximum capacity but no later than 180 days after initial startup.	40 CFR Section 60.13(b); Minn. R. 7017.1050, subp. 1
CEMS Certification Test Pretest Meeting: due 7 days before CEMS Certification Test.	Minn. R. 7017.1060, subp. 3
CEMS Certification Test Plan: due 60 days before CEMS Certification Test.	40 CFR Section 60.7(a)(5); Minn. R. 7017.1060, subp. 1 & 2, and 40 CFR Section 63.8(e)(3)
CEMS Certification Test Report: due 45 days after CEMS Certification Test	Minn. R. 7017.1080, subp. 1, 2, & 4; 40CFR 60.13(c)(2) and 40 CFR Section 63.8(e)(4)
Continuous Operation: CEMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A CEMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment.	40 CFR Section 60.13(e), Minn. R. 7017.1090, subp. 1
CEMS Certification Test Report - Microfiche Copy: due 105 days after CEMS Certification Test.	Minn. R. 7017.1080, subp. 3
CEMS QA/QC: The owner or operator of an affected facility is subject to the performance specifications listed in 40 CFR 60, Appendix B and shall operate, calibrate, and maintain each CEMS according to the QA/QC procedures in 40 CFR pt. 60, Appendix F as amended and maintain a written QA/QC program available in a form suitable for inspection.	40 CFR pt. 60, Appendix F; 40 CFR Section 60.13(a)
QA Plan: Develop and implement a written quality assurance plan that covers each CEMS. The plan shall be on site and available for inspection within 30 days after monitor certification. The plan shall contain all of the information required by 40CFR 60, App. F, section 3.	Minn. R. 7017.1170, subp. 2; 40 CFR pt. 60, App. F; section 3
CEMS Daily Calibration Drift (CD) Test: The CD shall be quantified and recorded at zero (low level value between 0 and 20 percent of span value) and span (50 to 100 percent of span value) gas concentrations at least once daily. The CEMS shall be adjusted whenever the CD exceeds twice the specification of 40 CFR pt. 60, Appendix B. 40 CFR pt. 60, Appendix F shall be used to determine out-of-control periods for CEMS.	40 CFR pt. 60, Appendix F, section 4.1; 40 CFR Section 60.13(d)(1); Minn. R. 7017.1170, subp. 3
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar year following CEMS Certification Test	40 CFR pt. 60, Appendix F, section 5.1.1; Minn. R. 7017.1170, subp. 5
Cylinder Gas Audit (CGA): due before end of each calendar quarter following CEMS certification test. A CGA is not required during any calendar quarter in which a RATA was performed.	40 CFR pt. 60, Appendix F, section 5.1.2; Minn. R. 7017.1170, subp. 4
Cylinder Gas Audit (CGA) Results Summary: due 30 days after end of each calendar quarter following Cylinder Gas Audit (CGA).	Minn. R. 7017.1180, subp.1
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar year following CEMS Certification Test	40 CFR pt. 60, Appendix F, section 5.1.1; Minn. R. 7017.1170, subp. 5
Relative Accuracy Test Audit (RATA) Notification: due 30 days before CEMS Relative Accuracy Test Audit (RATA)) .	Minn. R. 7017.1180, subp. 2
Relative Accuracy Test Audit (RATA) Results Summary: due 30 days after end of each calender quarter in which the CEMS RATA was conducted.	Minn. R. 7017.1180, subp. 3
Recordkeeping: The owner or operator must retain records of all CEMS monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130; 40 CFR Section 60.7(f)
Monitoring Data: Reduce all data to 1-hour averages, in accordance with 40 CFR Section 60.13(h). 1-hour averages shall be computed from four or more data points equally spaced over each 1-hour period.	40 CFR Section 60.13(h) regarding continuous monitoring systems other than COMS.

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **GP 004 Continuous Emission Monitors, Boilers 1A, 2A, 3A**

Associated Items: MR 002

MR 003

MR 005

MR 006

MR 008

MR 009

MR 014 Extracted sample SO2 monitor

MR 015 Extracted sample SO2 monitor

MR 016 Extracted sample SO2 monitor

What to do	Why to do it
Sulfur Dioxide Continuous Monitoring Systems	hdr
CEMS Daily Calibration Drift (CD) Test: The CD shall be quantified and recorded at zero (low-level) and upscale (high-level) gas concentrations at least once daily. The CEMS shall be adjusted whenever the CD exceeds twice the specification of 40 CFR pt. 60, Appendix B. 40 CFR pt. 60, Appendix F, shall be used to determine out-of-control periods for CEMS. Follow the procedures in 40 CFR pt. 60, Appendix F.	Minn. R. 7017.1170, subp. 3
Cylinder Gas Audit (CGA): due before end of each calendar half-year following CEMS Certification Test. Conduct CGA at least 3 months apart and not greater than 8 months apart. Follow the procedures in 40 CFR pt. 60, Appendix F.	Minn. R. 7017.1170, subp. 4
Cylinder Gas Audit (CGA) Results Summary: due 30 days after end of each calendar half-year following Cylinder Gas Audit (CGA)	Minn. R. 7017.1180, subp. 1
CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar year following CEMS Certification Test. If the relative accuracy is 15% or less the next CEMS RATA is not due for 24 months. Follow the procedures in 40 CFR pt. 60, Appendix B and Appendix F.	Minn. R. 7017.1170, subp. 5
Relative Accuracy Test Audit (RATA) Notification: due 30 days before CEMS Relative Accuracy Test Audit (RATA).	Minn. R. 7017.1180, subp. 2
Relative Accuracy Test Audit (RATA) Results Summary: due 30 days after end of each calender quarter in which the CEMS RATA was conducted.	Minn. R. 7017.1180, subp. 3
OPACITY CONTINUOUS MONITORS	hdr
All COMS shall complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle of data for each successive 6-minute period.	Minn. R. 7017.1200, subp. 1, 2 & 3; 40 CFR Section 60.13(e)(1); 40 CFR Section 60.13(h)
Continuous Operation: COMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A COMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment. Acceptable monitor downtime includes reasonable periods as listed in Items A, B, C and D of Minn. R. 7017.1090, subp. 2.	Minn. R. 7017.1090, subp. 1; 40 CFR Section 60.13(e)
COMS QA/QC: The owner or operator of an affected facility is subject to the performance specifications listed in 40 CFR pt. 60, Appendix B and shall operate, calibrate, and maintain each COMS according to the QA/QC procedures in Minn. R. 7017.1210.	40 CFR Section 60.13(a); Minn. R. 7017.1210
COMS Daily Calibration Drift Check: The Permittee must automatically, intrinsic to the opacity monitor, check the zero and upscale (span) calibration drifts at least once daily. The acceptable range is as defined in 40 CFR pt. 60, Appendix B, PS-1. The span value shall be between 60% and 80%. For COMS without automatic zero adjustments. The optical surfaces exposed to the effluent gases shall be cleaned prior to performing the zero and span drift adjustments. For COMS with automatic zero adjustmens the optical surfaces shall be cleaned when the cumulative automatic zero compensation exceeds 4 percent opacity. Minimum procedures must include an automated method for producing a simulated zero opacity condition and an upscale opacity condition as specified in 40 CFR 60.13(d)(2).	Minn. R. 7017.1210, subp. 2; 40 CFR Section 60.13(d)(l) regarding COMS and 60.13(d)(2)
COMS Calibration Error Audit: due before end of each calendar half-year following COMS Certification Test. Conduct three point calibration error audits at least 3 months apart but no greater than 8 months apart. Conduct audits in accordance with Minn. R. 7017.1210, subp. 3.	Minn. R. 7017.1210, subp. 3

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Attenuator Calibration: The Permittee shall perform an attenuator calibration in accordance with Minn. R. 7017.1210, subp. y.	Minn. R. 7017.1210, subp. 4
COMS Calibration Error Audit Results Summary: due 30 days after end of each calendar quarter in which the COMS calibration error audit was completed.	Minn. R. 7017.1220
Recordkeeping: The owner or operator must retain records of all COMS and CEMs monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 001 Boiler No. 1A**

Associated Items: CE 001 Electrostatic Precipitator - High Efficiency

GP 001 Boilers 1A, 2A, and 3A

MR 002

MR 003

MR 014 Extracted sample SO2 monitor

SV 001 Boiler 1A

SV 019 Boilers 1A and 2A

What to do	Why to do it
EMISSION AND FUEL LIMITS	hdr
Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input	Minn. R. 7011.0510, subp. 1
Particulate Matter < 10 micron: less than or equal to 0.074 lbs/million Btu heat input , inclusive of soot blowing, on a 24 hour average basis.	Title I Condition: 40 CFR 52.21(k) Ambient Impacts Analysis
Opacity: less than or equal to 20 percent except for one six-minute period per hour of not more than 60 percent opacity. An exceedance of this opacity standard occurs whenever any one-hour period contains two or more six-minute periods during which the average opacity exceeds 20 percent or whenever any one-hour period contains one or more six-minute periods during which the average opacity exceeds 60 percent.	40 CFR Part 64, also meets the requirements of Minn. R. 7011.0510, subp. 2
Sulfur Dioxide: less than or equal to 4.0 lbs/million Btu heat input using 1-Hour Average . See GP 001 for additional SO2 emissions limits. This limit applies until the startup of the wood fired boiler.	Minn. R. 7011.0510, subp. 1
Sulfur Dioxide: less than or equal to 1.58 lbs/million Btu heat input based on a 1-hour average. This limit applies after the startup of the wood fired boiler.	Minn. R. 7009, Ambient Standards
OPERATING CONDITIONS	hdr
Soot may be blown only two hours per day.	Title I Condition: 40 CFR 52.21(k) Ambient Impacts Analysis
Fuels Allowed: bituminous coal, subbituminous coal, used oil, natural gas and oily cellulose-based sorbents (including rags).	Minn. R. 7007.0800, subp. 2
Vent emissions through SV019 prior to startup of the wood boiler.	40 CFR 50, Minn. R. 7009
PERFORMANCE TESTING	hdr
Performance Test: due before end of each 60 months starting 10/06/1999 to measure particulate matter emissions from EU 001. The performance tests shall be conducted at an interval not to exceed 60 months between tests. The first test required under this condition shall be conducted by 10/06/2004.	Minn. R. 7017.2020, subp. 1
Performance Test: due 180 days after Permit Issuance for PM10 emissions. Testing shall be conducted during soot-blowing conditions as well as non-soot-blowing conditions. Emissions from three runs of non-soot-blowing emissions and from one run during which a normal duration soot-blowing occurs shall be collected. Compliance shall be determined by taking the average of the three non-soot-blowing tests x 22 hours per day, plus the result of the soot-blowing-test x 2 hours per day, then summed and averaged over a 24-hour period.	Title I Condition: to determine compliance with PM10 limit
Boiler Alternative Operating Conditions for Performance Testing: Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 2(A) and 3(B)

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing: If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited to an 8-hour block average based on the following: (1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate. (2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 3(B)
STET (Short Term Emergency and Testing) Operating hours limit: The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.	Minn. R. 7007.0800, subp. 2
STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing: If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average rate achieved during that performance test. If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test. In no case will STET operation be higher than allowed by an existing permit condition.	Minn. R. 7007.0800, subp. 2
The results of a performance test are not final until issuance of a review letter by MPCA, unless specified otherwise by Minn. R. 7017.2001-7017.2060.	Minn. R. 7017.2020, subp. 4
CONTINUOUS MONITORING REQUIREMENTS	hdr
Emissions Monitoring: The Permittee shall use a COMS to measure opacity emissions from EU 001.	Minn. R. 7007.0800, subp. 2
Emissions Monitoring: The Permittee shall use a SO2 CEMS to measure SO2 emissions from EU 001.	Minn. R. 7007.0800, subp. 2
CONTROL EQUIPMENT OPERATING PARAMETERS	hdr
Collect the secondary current and voltage or total power input monitoring system data for the electrostatic precipitator according to 40 CFR Section 63.7525.	40 CFR Part 64
Reduce the data to 3-hour block averages; and Maintain the 3-hour average secondary current and voltage or total power input at or above the level established during the most recent performance test that demonstrated compliance with the particulate matter and PM10 emission limits.	continued from above

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 002 Boiler No. 2A**

Associated Items: CE 002 Electrostatic Precipitator - High Efficiency

GP 001 Boilers 1A, 2A, and 3A

MR 005

MR 006

MR 015 Extracted sample SO2 monitor

SV 002 Boiler 2A

SV 019 Boilers 1A and 2A

What to do	Why to do it
EMISSION AND FUEL LIMITS	hdr
Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input	Minn. R. 7011.0510, subp. 1
Particulate Matter < 10 micron: less than or equal to 0.074 lbs/million Btu heat input , inclusive of soot blowing, on a 24 hour average basis.	Title I Condition: 40 CFR 52.21(k) Ambient Impacts Analysis
Opacity: less than or equal to 20 percent except for one six-minute period per hour of not more than 60 percent opacity. An exceedance of this opacity standard occurs whenever any one-hour period contains two or more six-minute periods during which the average opacity exceeds 20 percent or whenever any one-hour period contains one or more six-minute periods during which the average opacity exceeds 60 percent.	40 CFR Part 64, also meets the requirements of Minn. R. 7011.0510, subp. 2
Sulfur Dioxide: less than or equal to 4.0 lbs/million Btu heat input using 1-Hour Average . See GP 001 for additional SO2 emissions limits. This limit applies until the startup of the wood fired boiler.	Minn. R. 7011.0510, subp. 1
Sulfur Dioxide: less than or equal to 1.58 lbs/million Btu heat input based on a 1-hour average. This limit applies after the startup of the wood fired boiler.	Minn. R. 7009, Ambient Standards
OPERATING CONDITIONS	hdr
Soot may be blown only two hours per day.	Title I Condition: 40 CFR 52.21(k) Ambient Impacts Analysis
Fuels Allowed: bituminous coal, subbituminous coal, natural gas, used oil, and oily cellulose-based sorbents (including rags).	Minn. R. 7007.0800, subp. 2
Vent emissions through SV019 prior to startup of the wood boiler.	40 CFR 50, Minn. R. 7009
PERFORMANCE TESTING REQUIREMENTS	hdr
Performance Test: due before end of each 60 months starting 10/06/1999 to measure particulate matter emissions from EU 002. The peformance tests shall be conducted at an interval not to exceed 60 months between tests. The first test required under this condition shall be conducted by 10/06/2004.	Minn. R. 7017.2020, subp. 1
Performance Test: due 180 days after Permit Issuance for PM10 emissions. Testing shall be conducted during soot-blowing conditions as well as non-soot-blowing conditions. Emissions from three runs of non-soot-blowing emissions and from one run during which a normal duration soot-blowing occurs shall be collected. Compliance shall be determined by taking the average of the three non-soot-blowing tests x 22 hours per day, plus the result of the soot-blowing-test x 2 hours per day, then summed and averaged over a 24-hour period.	Title I Condition: to determine compliance with PM10 limit
Boiler Alternative Operating Conditions for Performance Testing: Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 2(A) and 3(B)

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing: If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited to an 8-hour block average based on the following: (1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate. (2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 3(B)
STET (Short Term Emergency and Testing) Operating hours limit: The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.	Minn. R. 7007.0800, subp. 2
STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing: If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average rate achieved during that performance test. If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test. In no case will STET operation be higher than allowed by an existing permit condition.	Minn. R. 7007.0800, subp. 2
The results of a performance test are not final until issuance of a review letter by MPCA, unless specified otherwise by Minn. R. 7017.2001-7017.2060.	Minn. R. 7017.2020, subp. 4
CONTINUOUS MONITORING REQUIREMENTS	hdr
Emissions Monitoring: The Permittee shall use a COMS to measure opacity emissions from EU 002.	Minn. R. 7007.0800, subp. 2
Emissions Monitoring: The Permittee shall use a SO2 CEMS to measure SO2 emissions from EU 002.	Minn. R. 7007.0800, subp. 2
CONTROL EQUIPMENT OPERATING PARAMETERS	hdr
Collect the secondary current and voltage or total power input monitoring system data for the electrostatic precipitator according to 40 CFR Section 63.7525.	40 CFR Part 64
Reduce the data to 3-hour block averages; and Maintain the 3-hour average secondary current and voltage or total power input at or above the level established during the most recent performance test that demonstrated compliance with the particulate matter and PM10 emission limits.	continued from above

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 003 Boiler No. 3A**

Associated Items: CE 003 Electrostatic Precipitator - High Efficiency

GP 001 Boilers 1A, 2A, and 3A

MR 008

MR 009

MR 016 Extracted sample SO2 monitor

SV 003 Boiler 3A

What to do	Why to do it
EMISSION AND FUEL LIMITS	hdr
Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input	Minn. R. 7011.0510, subp. 1
Particulate Matter < 10 micron: less than or equal to 0.128 lbs/million Btu heat input , inclusive of soot blowing, on a 24 hour average basis.	Title I Condition: 40 CFR 52.21(k) Ambient Impacts Analysis
Opacity: less than or equal to 20 percent except for one six-minute period per hour of not more than 60 percent opacity. An exceedance of this opacity standard occurs whenever any one-hour period contains two or more six-minute periods during which the average opacity exceeds 20 percent or whenever any one-hour period contains one or more six-minute periods during which the average opacity exceeds 60 percent.	40 CFR Part 64, also meets the requirements of Minn. R. 7011.0510, subp. 2
Sulfur Dioxide: less than or equal to 4.0 lbs/million Btu heat input using 1-Hour Average . See GP 001 for additional SO2 emissions limits. This limit applies until the startup of the wood fired boiler.	Minn. R. 7011.0510, subp. 1
Sulfur Dioxide: less than or equal to 1.58 lbs/million Btu heat input based on a 1-hour average. This limit applies after the startup of the wood fired boiler.	Minn. R. 7009, Ambient Standards
OPERATING CONDITIONS	hdr
Soot may be blown only two hours per day.	Title I Condition: 40 CFR 52.21(k) Ambient Impacts Analysis
Fuels Allowed: bituminous coal, subbituminous coal, natural gas, used oil, and oily cellulose-based sorbents (including rags).	Minn. R. 7007.0800, subp. 2
PERFORMANCE TESTING REQUIREMENTS	hdr
Performance Test: due before end of each 60 months starting 10/06/1999 to measure particulate matter emissions from EU 003. The performance tests shall be conducted at an interval not to exceed 60 months between tests. The first test required under this condition shall be conducted by 10/06/2004.	Minn. R. 7017.2020, subp. 1
Performance Test: due 180 days after Permit Issuance for PM10 emissions. Testing shall be conducted during soot-blowing conditions as well as non-soot-blowing conditions. Emissions from three runs of non-soot-blowing emissions and from one run during which a normal duration soot-blowing occurs shall be collected. Compliance shall be determined by taking the average of the three non-soot-blowing tests x 22 hours per day, plus the result of the soot-blowing-test x 2 hours per day, then summed and averaged over a 24-hour period.	Title I Condition: to determine compliance with PM10 limit
Boiler Alternative Operating Conditions for Performance Testing: Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 2(A) and 3(B)

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing: If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited to an 8-hour block average based on the following: (1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate. (2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 3(B)
STET (Short Term Emergency and Testing) Operating hours limit: The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.	Minn. R. 7007.0800, subp. 2
STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing: If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average rate achieved during that performance test. If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test. In no case will STET operation be higher than allowed by an existing permit condition.	Minn. R. 7007.0800, subp. 2
The results of a performance test are not final until issuance of a review letter by MPCA, unless specified otherwise by Minn. R. 7017.2001-7017.2060.	Minn. R. 7017.2020, subp. 4
CONTINUOUS MONITORING REQUIREMENTS	hdr
Emissions Monitoring: The Permittee shall use a COMS to measure opacity emissions from EU 003.	Minn. R. 7007.0800, subp. 2
Emissions Monitoring: The Permittee shall use a SO2 CEMS to measure SO2 emissions from EU 003.	Minn. R. 7007.0800, subp. 2
CONTROL EQUIPMENT OPERATING PARAMETERS	hdr
Collect the secondary current and voltage or total power input monitoring system data for the electrostatic precipitator according to 40 CFR Section 63.7525.	40 CFR Part 64
Reduce the data to 3-hour block averages; and Maintain the 3-hour average secondary current and voltage or total power input at or above the level established during the most recent performance test that demonstrated compliance with the particulate matter and PM10 emission limits.	continued from above

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 004 Coal Ash Silo**

Associated Items: CE 004 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 004 Coal Ash Silo

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot unless required to further reduce emissions to the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0715, subp. 1(A)
Particulate Matter < 10 micron: less than or equal to 0.002 grains/dry standard cubic foot	40 CFR Section 52.21(k), Ambient Impacts Analysis
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715
For compliance demonstration, see GP002 requirements table.	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 005 High School Boiler 1**

Associated Items: SV 005 High School Boiler 1

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input	Minn. R. 7011.0510, subp. 1
Opacity: less than or equal to 20 percent opacity except for one 6-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0510, subp. 2
Fuel use limited to natural gas.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 006 High School Boiler 2**

Associated Items: SV 006 High School Boiler 2

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input	Minn. R. 7011.0510, subp. 1
Opacity: less than or equal to 20 percent opacity except for one 6-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0510, subp. 2
Fuel use limited to natural gas.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 007 Wood Fired Boiler**

Associated Items: CE 005 Multiple Cyclone w/o Fly Ash Reinjection - Most Multiclones

CE 006 Electrostatic Precipitator - High Efficiency

CE 007 Selective Noncatalytic Reduction for NOX

MR 010

MR 011

MR 012

MR 013

SV 007 LEA Wood Fired Boiler

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.025 lbs/million Btu heat input . This limit applies at all times, except during periods of startup, shutdown or malfunction.	Title I Condition: BACT limit; 40 CFR 52.21(j), also meets the requirements of 40 CFR Section 63.7500 and 40 CFR Section 60.43b(c)(1)
Particulate Matter < 10 micron: less than or equal to 0.025 lbs/million Btu heat input . This limit applies at all times, except during periods of startup, shutdown or malfunction.	Title I Condition: BACT limit; 40 CFR 52.21(j)
Carbon Monoxide: less than or equal to 0.3 lbs/million Btu heat input based on a 4-hour block average. ""Four-hour block average" means the average of all hourly emission rates when the emissions unit is operating over six discreete four-hour periods beginning at midnight. This limit applies at all times, except during periods of startup, shutdown or malfunction.	Title I Condition: BACT limit; 40 CFR 52.21(j), also meets the requirements of 40 CFR Section 63.7500
Hydrochloric acid: less than or equal to 0.02 lbs/million Btu heat input . This limit applies at all times, except during periods of startup, shutdown or malfunction.	40 CFR Section 63.7500
Nitrogen Oxides: less than or equal to 0.15 lbs/million Btu heat input based on a 30-day rolling average.	Title I Condition: BACT limit; 40 CFR 52.21(j)
Mercury: less than or equal to 0.000003 lbs/million Btu heat input . This limit applies at all times, except during periods of startup, shutdown or malfunction.	40 CFR Section 63.7500
Opacity: less than or equal to 10 percent based on a 1-hour block average.	40 CFR Section 63.7500
Opacity: less than or equal to 20 percent based on a 6-minute average, except for one 6-minute period per hour of not more than 27 percent opacity. This limit applies at all times, except during periods of startup, shutdown or malfunction.	40 CFR Section 60.43b(f)
Ammonia Slip: limited to less than or equal to 25 ppm. If the ammonia slip exceeds this level, the SNCR system shall be adjusted to reduce the ammonia slip to less than 25 ppm, or shut down until repairs are made and normal operating conditions are achieved.	Minn. R. 7007.0800, subp. 2
OPERATING LIMITS	hdr
Fuel use limited to untreated wood, such as, but not limited to, logging waste, trees, brush, etc. Untreated wood is defined as any wood that has not been subject to any chemical treatment or coating. Examples are: 1) untreated residuals from manufacturing processes such as furniture, cabinet, and pallet making and other wood product manufacture; 2) construction waste; 3) urban and park tree trimming and forest residuals; 4) wood from trees downed by storms; 5) trees removed for urban development; 6) trees grown specifically to be used as fuel; and 6) trees removed as part of a timber management plan.	Minn. R. 7007.0800, subp. 2,
The SNCR system will be adjusted or may be shut down when the ammonia slip exceeds the limit set above, until such time as the system is returned to normal operation.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

At all times, including periods of startup, shutdown, and malfunction, you shall operate and maintain any affected source, including the associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by all relevant standards. Malfunctions shall be corrected as soon as practicable after their occurrence in accordance with the startup, shutdown, and malfunction plan required below and by 40 CFR Section 63.6(e)(3).	40 CFR Section 63.6(e)(1)(i) and 40 CFR Section 60.11(d)
Fuel use is limited in chlorine content to the maximum that was burned during the compliance test that demonstrated compliance with the HCl emission limit. Procedures for determining the maximum chlorine content are specified at 40 CFR Section 63.7530(c)(1)(i)-(iii).	40 CFR Section 63.7530(c)(1)
Fuel use is limited in mercury content to the maximum that was burned during the compliance test that demonstrated compliance with the mercury emission limit. Procedures for determining the maximum mercury content are specified at 40 CFR Section 63.7530(c)(3)(i)-(iii).	40 CFR Section 63.7530(c)(3)
INITIAL COMPLIANCE DEMONSTRATION	hdr
Performance Test: due 60 days after achieving maximum capacity but no later than 180 days after initial startup for particulate matter, PM10, and opacity. You must establish the minimum voltage and secondary current (or total power input) as defined in 40 CFR Section 63.7575.	40 CFR Section 63.7510(a), 40 CFR Section 60.11(e), Title I Condition; compliance with PM10 BACT limit
Determine compliance with the emission limits for hydrogen chloride and mercury through fuel analysis within 180 days of initial startup. Follow the procedures specified in 40 CFR Section 63.7521 and Table 6 to Subp. DDDDD.	40 CFR Section 63.7530(d)
CONTINUOUS MONITORING REQUIREMENTS	hdr
Install, maintain and operate a monitor to measure stack carbon monoxide emissions. The monitor shall meet the requirements of 40 CFR 63.7525(a). For more specific requirements, see the GP003 table in this permit.	40 CFR Section 63.7525(a)
Install, maintain, and operate a continuous monitor to measure the opacity of stack emissions. The monitor shall meet the requirements of 40 CFR 63.7525(b). For more specific requirements see the MR010 table in this permit.	40 CFR Section 63.7525(b) 40 CFR Section 60.48b(a)
Install, operate and maintain a continuous monitor to measure stack nitrogen oxides emissions. Installation, operation and maintenance shall be in accordance with 40 CFR Section 60.13 and 40 CFR 60, Appendix B. For more specific requirements, see the GP003 table in this permit.	Title I Condition: Monitoring of BACT limit 40 CFR Section 64.3(d)(2)
OPERATING CONDITIONS FOR CONTROL EQUIPMENT	hdr
At all times, including periods of startup, shutdown, and malfunction, you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions. During a period of startup, shutdown, or malfunction, this general duty to minimize emissions requires that you reduce emissions from the affected source to the greatest extent which is consistent with safety and good air pollution control practices.	40 CFR Section 63.7505(b), 40 CFR Section 63.6(e)(1)(i)
The general duty to minimize emissions during a period of startup, shutdown, or malfunction does not require you to achieve emission levels that would be required by the applicable standard at other times if this is not consistent with safety and good air pollution control practices, nor does it require you to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures (including the startup, shutdown, and malfunction plan required by 40 CFR Section 63.6(e), review of operation and maintenance records, and inspection of the source.	continued from above
Collect the secondary current and Voltage or total power input monitoring system data for the electrostatic precipitator according to 40 CFR Section 63.7525 and 63.7535; and reduce the data to 3-hour block averages; and maintain the 3-hour average secondary current and voltage or total power input at or above the operating limits established during the performance testaccording to 40 CFR Section 63.7530(c).	40 CFR Section 63.7530 40 CFR Section 63.7540(a)
SUBMITTALS AND REPORTING	hdr
Performance Test Notification (written): due 60 days before Performance Test	40 CFR Section 63.7545 Minn. R. 7017.2030, subp. 1, 40 CFR Section 63.7
RECORDKEEPING	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Keep all records readily available and on site for a period of 5 years. Maintain relevant records of each startup, shutdown, or malfunction of operation equipment and the occurance and duration of each malfunction of the required air pollution control and monitoring equipment.	40 CFR Section 60.7(b), 40 CFR Section 63.10(b)(1)
Maintain a file of all measurements, including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required by this part recorded in a permanent form suitable for inspection.	40 CFR Section 60.7(f)
Keep records of the type and amount of all fuels burned to demonstrate that all fuel types and mixtures of fuels burned would result in lower emissions of HCl and mercury than the applicable emission limit. If you plan to burn a new type of fuel, you must recalculate the HCl emission rate using Equation 9 of 40 CFR Section 63.7530 and 40 CFR Section 63.7540(a)(3). You must also recalculate the mercury emission rate according to 40 CFR Section 7540(a)(7) and equation 11 of 40 CFR Section 63.7530.	40 CFR Section 63.7540(a)(2)
Keep records of carbon monoxide levels according to 40 CFR Section 63.7555(b).	40 CFR Section 63.7540(a)(10)
Full recordkeeping requirements are specified in 40 CFR Section 63.7555 and include copies of all notifications, reports, tests, fuel analyses, compliance demonstrations, performance demonstrations, CEM and COMs data, deviations, fuel use, and all calculations that demonstrate compliance with emission limits,.	40 CFR Section 63.7555
STARTUP, SHUTDOWN AND MALFUNCTION PLAN	hdr
Startup, shutdown, and malfunction plan. (i) The owner or operator of an affected source must develop and implement a written startup, shutdown, and malfunction plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction, and a program of corrective action for malfunctioning process and air pollution control and monitoring equipment used to comply with the relevant standard. This plan must be developed by the owner or operator by the source's compliance date for that relevant standard. The purpose of the startup, shutdown, and malfunction plan is to¿	40 CFR Section 63.6(e)(3)(i)
(A) Ensure that, at all times, that you operate and maintain each affected source, including associated air pollution control and monitoring equipment, in a manner which satisfies the general duty to minimize emissions established by paragraph (e)(1)(i) of this section; (B) Ensure that you are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and (C) Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).	continued from above
During periods of startup, shutdown, and malfunction, you must operate and maintain such source (including associated air pollution control and monitoring equipment) in accordance with the procedures specified in the startup, shutdown, and malfunction plan developed under paragraph (e)(3)(i) of this section.	40 CFR Section 63.6(e)(3)(ii)
When actions taken by the owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) are consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, the owner or operator must keep records for that event which demonstrate that the procedures specified in the plan were followed. These records may take the form of a ¿checklist,¿ or other effective form of recordkeeping that confirms conformance with the startup, shutdown, and malfunction plan for that event.	40 CFR Section 63.6(e)(3)(iii)
In addition, you must keep records of these events as specified in Section 63.10(b), including records of the occurrence and duration of each startup, shutdown, or malfunction of operation and each malfunction of the air pollution control and monitoring equipment. Furthermore, you shall confirm that actions taken during the relevant reporting period during periods of startup, shutdown, and malfunction were consistent with the affected source's startup, shutdown and malfunction plan in the semiannual (or more frequent) startup, shutdown, and malfunction report required in Section 63.10(d)(5).	continued from above

If an action taken by you during a startup, shutdown, or malfunction (including an action taken to correct a malfunction) is not consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, and the source exceeds any applicable emission limitation in the relevant emission standard, then you must record the actions taken for that event and must report such actions within 2 working days after commencing actions inconsistent with the plan, followed by a letter within 7 working days after the end of the event, in accordance with Section 63.10(d)(5) (unless you make alternative reporting arrangements, in advance, with the Administrator).	40 CFR Section 63.6(e)(3)(iv)
You must maintain at the affected source a current startup, shutdown, and malfunction plan and must make the plan available upon request for inspection and copying by the Administrator. In addition, if the startup, shutdown, and malfunction plan is subsequently revised as provided in paragraph (e)(3)(viii) of this section, you must maintain at the affected source each previous (i.e., superseded) version of the startup, shutdown, and malfunction plan, and must make each such previous version available for inspection and copying by the Administrator for a period of 5 years after revision of the plan.	40 CFR Section 63.6(e)(3)(v)
If at any time after adoption of a startup, shutdown, and malfunction plan the affected source ceases operation or is otherwise no longer subject to the provisions of this part, you must retain a copy of the most recent plan for 5 years from the date the source ceases operation or is no longer subject to this part and must make the plan available upon request for inspection and copying by the Administrator. The Administrator may at any time request in writing that you submit a copy of any startup, shutdown, and malfunction plan (or a portion thereof) which is maintained at the affected source or in your possession.	continued from above.
Upon receipt of such a request, you must promptly submit a copy of the requested plan (or a portion thereof) to the Administrator. The Administrator must request that you submit a particular startup, shutdown, or malfunction plan (or a portion thereof) whenever a member of the public submits a specific and reasonable request to examine or to receive a copy of that plan or portion of a plan. You may elect to submit the required copy of any startup, shutdown, and malfunction plan to the Administrator in an electronic format. If you claim that any portion of such a startup, shutdown, and malfunction plan is confidential business information entitled to protection from disclosure under section 114(c) of the Act or 40 CFR 2.301, the material which is claimed as confidential must be clearly designated in the submission.	continued from above
To satisfy the requirements of this section to develop a startup, shutdown, and malfunction plan, you may use the affected source's standard operating procedures (SOP) manual, or an Occupational Safety and Health Administration (OSHA) or other plan, provided the alternative plans meet all the requirements of this section and are made available for inspection or submitted when requested by the Administrator.	40 CFR Section 63.6(e)(3)(vi)
Based on the results of a determination made under paragraph (e)(1)(i) of this section, the Administrator may require that you make changes to the startup, shutdown, and malfunction plan for that source. The Administrator must require appropriate revisions to a startup, shutdown, and malfunction plan, if the Administrator finds that the plan: (A) Does not address a startup, shutdown, or malfunction event that has occurred; (B) Fails to provide for the operation of the source (including associated air pollution control and monitoring equipment) during a startup, shutdown, or malfunction event in a manner consistent with the general duty to minimize emissions established by paragraph (e)(1)(i) of this section;	40 CFR Section 63.6(e)(3)(vii)
(C) Does not provide adequate procedures for correcting malfunctioning process and/or air pollution control and monitoring equipment as quickly as practicable; or (D) Includes an event that does not meet the definition of startup, shutdown, or malfunction listed in Section 63.2.	continued from above
You may periodically revise the startup, shutdown, and malfunction plan for the affected source as necessary to satisfy the requirements of this part or to reflect changes in equipment or procedures at the affected source. Unless the permitting authority provides otherwise, you may make such revisions to the startup, shutdown, and malfunction plan without prior approval by the Administrator or the permitting authority. However, each such revision to a startup, shutdown, and malfunction plan must be reported in the semiannual report required by Section 63.10(d)(5).	40 CFR Section 63.6(e)(3)(viii)

If the startup, shutdown, and malfunction plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction but was not included in the startup, shutdown, and malfunction plan at the time you developed the plan, you must revise the startup, shutdown, and malfunction plan within 45 days after the event to include detailed procedures for operating and maintaining the source during similar malfunction events and a program of corrective action for similar malfunctions of process or air pollution control and monitoring equipment.	continued from above
In the event that you make any revision to the startup, shutdown, and malfunction plan which alters the scope of the activities at the source which are deemed to be a startup, shutdown, or malfunction, or otherwise modifies the applicability of any emission limit, work practice requirement, or other requirement in a standard established under this part, the revised plan shall not take effect until after the you have provided a written notice describing the revision to the permitting authority.	continued from above
The title V permit for an affected source must require that you adopt a startup, shutdown, and malfunction plan which conforms to the provisions of this part, and that the owner or operator operate and maintain the source in accordance with the procedures specified in the current startup, shutdown, and malfunction plan. However, any revisions made to the startup, shutdown, and malfunction plan in accordance with the procedures established by this part shall not be deemed to constitute permit revisions under part 70 or part 71 of this chapter. Moreover, none of the procedures specified by the startup, shutdown, and malfunction plan for an affected source shall be deemed to fall within the permit shield provision in section 504(f) of the Act.	40 CFR Section 63.6(e)(3)(ix)
PERFORMANCE STACK EMISSION TESTING	hdr
All performance tests and fuel analyses used for demonstrating compliance with emission limits must be conducted on an annual basis except as provided for in 40 CFR Section 63.7515. If three consecutive tests show compliance with the emission limits, you may choose to conduct the performance tests for these pollutants every third year. If a test shows noncompliance with an emission limit you must conduct annual performance tests until all performance tests over a consecutive 3 year period show compliance.	40 CFR Section 63.7515
Performance tests and procedures under 40 CFR 63.7520 and 40 CFR Section 60.46b(d) must be followed. 40 CFR Section 63.7520 calls for: - a 60 day notice of intent to test, -development and submittal of a site specific test plan, -request and use of performance audit samples (request due 30 days prior to the test), -provision of adequate testing facilities, -testing during representative operation, -specifies that methods used be consistent with those specified in Parts 51, 60, 61, and 63--The methods are specified in Table 5 to Subp. DDDDD, and -submittal of results within 60 days of the performance test (Minn. R. requires submittal within 45 days, and will take precedence.) 40 CFR Section 60.46b(d) specifies test methods for particulate and opacity. Particulate matter test methods are the same as those specified in Table 5 to subp. DDDDD.	40 CFR Section 63.7520 40 CFR Section 60b(d) and (e)
Boiler Alternative Operating Conditions for Performance Testing: Alternative Operating Conditions during testing are defined as 90% to 100% of the boiler's maximum normal (continuous) operating load or the maximum permitted operating rate, whichever is lower. The basis for this number must be included in the test plan. If testing is conducted at the alternative operating condition established, an operating limit will not be established as a result of performance testing. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 2(A) and 3(B)

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Boiler Operating Conditions Not Meeting the Alternative Operating Conditions During Performance Testing: If performance testing is not conducted at or above the established alternative operating condition, then the boiler operating rate will be limited to an 8-hour block average based on the following: (1) If the results of the performance test are greater than 80% of any applicable emission limit for which compliance is demonstrated, then boiler operation will be limited to the tested operating rate. (2) If results are less than or equal to 80% of all applicable emission limits for which compliance is demonstrated, boiler operation will be limited to 110% of the tested operating rate. In no case will the new operating rate limit be higher than allowed by an existing permit condition.	Minn. R. 7017.2025, subp. 3(B)
STET (Short Term Emergency and Testing) Operating hours limit: The boiler may operate up to 40 hours per year to demonstrate the Uniform Rating of Generating Equipment (URGE) capacity and to meet emergency energy supply needs. Maintain documentation of all STET operation to demonstrate compliance with this limit. The boiler must meet emission limits during STET operation.	Minn. R. 7007.0800, subp. 2
STET Operation Definition that applies to Boilers that Meet or do Not Meet the Alternative Operating Condition for Performance Testing: If performance test results demonstrate compliance at 80% or less of any applicable emission limits for any tested pollutant, STET operation is defined as operation beyond 110% of the average rate achieved during that performance test. If performance test results demonstrate compliance at greater than 80% any applicable emission limit for any tested pollutant, STET operation is defined as operation beyond 100% of the average operating rate achieved during that performance test. In no case will STET operation be higher than allowed by an existing permit condition.	Minn. R. 7007.0800, subp. 2
CONTROL EQUIPMENT OPERATING PARAMETERS	hdr
Collect the secondary current and voltage or total power input monitoring system data for the electrostatic precipitator according to 40 CFR Section 63.7525.	40 CFR Section 63.7540 and Table 8 to Subp. DDDDD
Reduce the data to 3-hour block averages; and Maintain the 3-hour average secondary current and voltage or total power input at or above the level established during the most recent performance test that demonstrated compliance with the particulate matter and PM10 emission limits.	continued from above

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 008 Enclosed wood unloading**

Associated Items: CE 008 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 008 Enclosed Wood Unloading Area

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Particulate Matter < 10 micron: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715
For compliance demonstration, see GP002 requirements table.	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 009 Wood Storage Silo**

Associated Items: CE 009 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 010 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 009 Wood Storage Silo Vent #1

SV 010 Wood Storage Silo Vent #2

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Particulate Matter < 10 micron: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715
For compliance demonstration, see GP002 requirements table.	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 010 Wood Conveyor System**

Associated Items: CE 011 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 011 Wood Conveyor

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Particulate Matter < 10 micron: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715
For compliance demonstration, see GP002 requirements table.	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 011 Wood Transfer/Metering Bin**

Associated Items: CE 012 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 012 Wood Transfer/Metering Bin

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Particulate Matter < 10 micron: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715
For compliance demonstration, see GP002 requirements table.	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 012 Emergency Generator**

Associated Items: SV 013 Emergency Generator

What to do	Why to do it
EMISSION LIMITS	hdr
Particulate Matter < 10 micron: less than or equal to 0.14 lbs/million Btu heat input	Title I Condition: BACT limit; 40 CFR 52.21(j)
Nitrogen Oxides: less than or equal to 2.88 lbs/million Btu heat input	Title I Condition: BACT limit; 40 CFR 52.21(j)
Carbon Monoxide: less than or equal to 0.85 lbs/million Btu heat input	Title I Condition: BACT limit; 40 CFR 52.21(j)
Opacity: less than or equal to 20 percent once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
OPERATING CONDITIONS	hdr
Fuel use limited to distillate oil with a maximum of 0.5% sulfur by weight.	Minn. R. 7007.0800, subp. 2
Operating Hours: less than or equal to 500 hours/year based on a 12 month rolling sum.	Title I Condition: 40 CFR 52.21(k), Ambient Impacts Analysis
MONITORING CONDITIONS	hdr
Record the previous month's hours of operation by the 15th of each month. Add to the preceeding 11 month's hours of operation and compare to the limit. Record the results.	Title I Condition: To demonstrate compliance with limit on hours of operation
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of distillate oil, certifying that the sulfur content does not exceed 0.5% by weight.	Minn. R. 7007.0800, subps. 4 & 5
PERFORMANCE TESTING	hdr
Performance Test: due 180 days after Initial Startup for PM10, NOx and CO. For performance test required notifications and submittals see the total facility requirements table.	Title I Condition: determine compliance with BACT limits
NESHAP REQUIREMENTS	hdr
Within 120 calendar days after the source becomes subject to the relevant standard (initial startup), provide the following information: (i) The name and address of the owner or operator; (ii) The address (i.e., physical location) of the affected source; (iii) An identification of the relevant standard, or other requirement, that is the basis of the notification and the source's compliance date;	40 CFR Section 63.6590 40 CFR Section 63.6645(d) 40 CFR Section 63.9(b)(2)(i)-(v)
(iv) A brief description of the nature, size, design, and method of operation of the source and an identification of the types of emission points within the affected source subject to the relevant standard and types of hazardous air pollutants emitted; and (v) A statement of whether the affected source is a major source or an area source.	continued from above

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **EU 013 Ash Storage Silo**

Associated Items: CE 013 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 014 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 014 Ash Silo Vent #1

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Particulate Matter < 10 micron: less than or equal to 0.002 grains/dry standard cubic foot	Title I Condition: BACT limit; 40 CFR 52.21(j)
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715
For compliance demonstration, see GP002 requirements table.	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: FS 002 Truck Traffic

What to do	Why to do it
Under dry pavement conditions, if the temperature is less than 32 degrees F, sweeping of all traffic areas is required twice monthly. Sweeping is not required if the pavement is snow or ice covered.	Minn. R. 7011.0150
Under dry pavement conditions, if the temperature is greater than 32 degrees F, sweeping and flushing are required twice monthly.	continued from above

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: FS 003 Coal Ash Loadout

What to do	Why to do it
Ash shall be wetted prior to loadout.	Title I Condition: 40 CFR 52.21(k), Ambient Impacts Analysis

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: FS 004 Wood Ash Loadout

What to do	Why to do it
Ash shall be wetted prior to loadout.	Title I Condition: 40 CFR 52.21(k), Ambient Impacts Analysis

TABLE A: LIMITS AND OTHER REQUIREMENTS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

Subject Item: **MR 010**

Associated Items: EU 007 Wood Fired Boiler

What to do	Why to do it
Installation Notification: due 60 days before installing the continuous opacity monitoring system.	Minn. R. 7017.1040, subp. 1
COMS Certification Test: due 60 days after achieving maximum capacity but no later than 180 days after initial startup.	Minn. R. 7017.1050, subp. 1; 40 CFR Section 60.8(a)
COMS Certification Test Plan: due 30 days before COMS Certification Test.	Minn. R. 7017.1060, subp. 1 & 2
COMS Certification Test Pretest Meeting: due 7 days before COMS Certification Test.	Minn. R. 7017.1060, subp. 3
COMS Certification Test Report: due 45 days after COMS Certification Test.	Minn. R. 7017.1080, subp. 1, 2 & 4
COMS Certification Test Report - Microfiche Copy: due 105 days after COMS Certification Test	Minn. R. 7017.1080, subp. 3
Continuous Operation: CEMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A CEMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment. Acceptable monitor downtime includes reasonable periods as listed in Items A, B, C and D of Minn. R. 7017.1090, subp. 2.	Minn. R. 7017.1090, subp. 1; 40 CFR Section 60.13(e)
COMS Daily Calibration Drift Check: The Permittee must automatically, intrinsic to the opacity monitor, check the zero and upscale (span) calibration drifts at least once daily. The acceptable range is as defined in 40 CFR pt. 60, Appendix B, PS-1. The span value shall be between 60% and 80%. For COMS without automatic zero adjustments the optical surfaces exposed to the effluent gases shall be cleaned prior to performing the zero and span drift adjustments. For COMS with automatic zero adjustments, the optical surfaces shall be cleaned when the cumulative automatic zero compensation exceeds 4 percent opacity. Minimum procedures must include an automated method for producing a simulated zero opacity condition and an upscale opacity condition as specified in 40 CFR 60.13(d)(2).	Minn. R. 7017.1210, subp. 2; 40 CFR Section 60.13(d)
COMS Calibration Error Audit: due before end of each calendar half-year following COMS Certification Test. Conduct three point calibration error audits at least 3 months apart but no greater than 8 months apart. Filter values used shall correspond to approximately 11%, 20%, and 37% opacity.	Minn. R. 7017.1210, subp. 3
COMS Calibration Error Audit Results Summary: due 30 days after end of each calendar half-year following COMS Calibration Error Audit.	Minn. R. 7017.1220
The COMS shall complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle of data for each successive 6-minute period. Six minute opacity averages shall be calculated from 36 or more data points equally spaced over each 6-minute period. The COMS shall complete a minimum of one cycle of operation for each successive 15-minute period.	Minn. R. 7017.1200, subp. 1, 2 & 3; 40 CFR Section 60.13(e)(1); 40 CFR Section 60.13(h)
Recordkeeping: The owner or operator must retain records of all COMS monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130
QA Plan Required: Develop and implement a written quality assurance plan which covers each COMS. The plan shall be on site and available for inspection within 30 days after monitor certification. The plan shall contain the written procedures listed in Minn. R. 7017.1210, subp. 1.	Minn. R. 7017.1210
COMS QA/QC: The owner or operator of an affected facility is subject to the performance specifications listed in 40 CFR pt. 60, Appendix B and shall operate, calibrate, and maintain each COMS according to the QA/QC procedures in Minn. R. 7017.1210.	40 CFR Section 60.13(a); Minn. R. 7017.1210
Attenuator Calibration: The Permittee shall perform an attenuator calibration in accordance with Minn. R. 7017.1210, subp. y.	Minn. R. 7017.1210, subp. y

TABLE B: SUBMITTALS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

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

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

Send any application for a permit or permit amendment to:

Permit Technical Advisor
Permit Section
Air Quality Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Also, where required by an applicable rule or permit condition, send to the Permit Technical Advisor notices of:
- accumulated insignificant activities,
- installation of control equipment,
- replacement of an emissions unit, and
- changes that contravene a permit term.

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

Supervisor
Compliance Determination Unit
Air Quality Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

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

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

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

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

TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

What to send	When to send	Portion of Facility Affected
Application for Permit Reissuance	due 180 days before expiration of Existing Permit	Total Facility
Computer Dispersion Modeling Results	due before Initial Startup of the wood boiler for PM10, NOx, and CO that represent the conditions that will be present when Boilers 1A and 2A are vented through SV019.	Total Facility
Notification of the Actual Date of Initial Startup	due 15 days after Initial Startup. The notification shall include the design heat input capacity of the affected facility and identification of the fuels to be combusted in the affected facility.	EU007
Notification of the Date Construction Began	due 30 days after Start Of Construction. Submit the name and number of each unit and the date construction of each unit began.	EU007
Notification	due 120 days after 11/12/2004, (effective date of 40 CFR Subp. DDDDD) for the existing boilers, as applicable.	Total Facility
Performance Test Plan	due 30 days before Performance Test that is a site-specific plan to the EPA Administrator and the Commissioner for review and approval according tto the procedures and requirements in 40 CFR Section 63.7520.	EU007
Report	due 60 days before Anticipated Date of Initial Startup that is a site-specific fuel analysis plan to the EPA Administrator for review and approval according tto the procedures and requirements in 40 CFR Section 63.7521.	EU007
Testing Frequency Plan	due 60 days after Initial Performance Test for PM10 emissions. The plan shall specify a testing frequency based on the test data and MPCA guidance. Future performance tests based on one-year (12 month), 36 month, and 60 month intervals, or as applicable, shall be required upon written approval of the MPCA.	EU001, EU002, EU003, GP002

TABLE B: RECURRENT SUBMITTALS

06/30/05

Facility Name: Hibbing Public Utilities

Permit Number: 13700027 - 003

What to send	When to send	Portion of Facility Affected
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor	GP004
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (Submit Deviations Reporting Form DRF-1 as amended). The EER shall indicate all periods of monitor bypass and all periods of exceedances of the limit including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions.	MR010
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor The EER shall indicate all periods of monitor bypass and all periods of exceedances of the limit including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions.	GP003
Semiannual Deviations Report	due 30 days after end of each calendar half-year following Permit Issuance. The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occured, the Permittee shall submit the report stating no deviations. The report must comply with and contain the information specified in 40 CFR Section 63.7550.	EU007
Semiannual Deviations Report	due 30 days after end of each calendar half-year starting 09/12/1997. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occurred, the Permittee shall submit the report stating no deviations. For the Wood Fired Boiler, the report must contain the information specified in Table 9 to Subpart DDDDD of Part 63, Number 1 and 40 CFR Section 63.7550.	Total Facility
Compliance Certification	due 30 days after end of each calendar year starting 09/12/1997 (for the previous calendar year). To be submitted on a form approved by the Commissioner. The report covers all deviations experienced during the calendar year. A copy of this report shall also be submitted to the US EPA Regional Office.	Total Facility

APPENDIX MATERIAL
Facility Name:Hibbing Public Utilities
Permit Number: 13700027-003

Insignificant Activities Required to be Listed

Description	Basis	Applicable Regulations
Facility wide VOC usage in cleaning solvents	Minn. R. 7007.1300, subp. 3 H (1)	
4 Welders	Minn. R. 7007.1300, subp. 3 H (4)	Minn. R. 7011.0710-0715
Aerosol paints used infrequently for routine maintenance	Minn. R. 7007.1300, subp. 3 K	
Cooling tower 1, actual PM< 1 ton/yr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715
Cooling tower 2, actual PM< 1 ton/yr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715
Coal transfer to bunker, actual PM< 1 ton/yr	Minn. R. 7007.1300, subp. 4	
Reserve coal pile (enclosed), actual PM< 1 ton/yr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715
Coal transfer to reserve coal pile, actual PM< 1 ton/yr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715
Coal reclaim from reserve coal pile, actual PM< 1 ton/yr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715
Ash truck loading, potential PM< 2.28 lb/hr	Minn. R. 7007.1300, subp. 4	
Bead blaster	Minn. R. 7007.1300, subp. 3 D (2)	
Coal Ash Silo, potential PM< 2.28 lb/hr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715
Enclosed Wood Unloading, potential PM <2.28 lb/hr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715 40 CFR 52.21
Enclosed Wood Storage Silo, potential PM<2.28 lb/hr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715 40 CFR 52.21
Wood conveyor System, potential PM<2.28 lb/hr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715 40 CFR 52.21
Wood Transfer/Metering Bin, potential PM<2.28 lb/hr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715 40 CFR 52.21
Wood Ash Storage Silo, potential PM<2.28 lb/hr	Minn. R. 7007.1300, subp. 4	Minn. R. 7011.0710-0715 40 CFR 52.21

Stack Parameters Used in Modeling

SV	Height (ft.)	Diameter (ft.)	Flow Rate (acfm)	Temperature (F)
SV001, Boiler 1A	113.2	7.7	109,085	350
SV002 Boiler 2A	113.2	7.7	109,085	350
SV003 Boiler 3A	121.7	7.5	147,842	350
SV004 Coal Ash Silo	92	1	2363	170
SV005 HS Boiler 1	140	1.92	7850	1800
SV006 HS Boiler 2	140	1.92	6850	1800
SV007 Wood Boiler	150	6.5	94,562	325
SV008 Enclosed Wood Unloading Area	40	2.5	35,000	70
SV009 Wood Silo Vent 1	60	0.67	3000	70
SV010 Wood Silo Vent 2	60	0.67	3000	70
SV011 Wood Conveyor	40	1.00	7000	70
SV012 Wood Transfer/ Metering Bin	60	1.00	7000	70
SV013 Emergency Generator	50	0.984	12,170	70
SV014 Ash Silo Vent 1	55	0.74	100	100
SV015 West Cooling Tower Cell 1	39.4	18	557,578	100
SV016 West Cooling Tower Cell 2	39.4	18	557,578	100
SV017 East Cooling Tower Cell 1	39.4	18	498,819	100
SV018 East Cooling Tower Cell 2	39.4	18	498,819	100
SV019 Boilers 1A and 2A after Wood Boiler Startup	155	10.5	218,296	359

TECHNICAL SUPPORT DOCUMENT
For
AIR EMISSION PERMIT NO. 13700027-003

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

1. General Information

1.1. Applicant and Stationary Source Location:

Owner/Operator Address and Phone Number	Facility Address (SIC Code: 4911)
Hibbing Public Utilities and Laurentian Energy Authority 1902 Sixth Avenue East P.O. Box 249 Hibbing, MN 55753 Phone: (218) 262-7728	Hibbing Public Utilities 1832 Sixth Avenue East Hibbing, MN 55746

Contact: Mr. Greg Galatz, Design Engineering Tech

1.2. Description Of The Facility

The Hibbing Public Utilities Commission (HPUC) operates a co-generation facility for the City of Hibbing. The facility generates electrical power for the City and steam for space heating of businesses, schools, and residences. The HPUC power plant is located in downtown Hibbing and was originally constructed in 1919. The emission units at the source consist of three coal/natural gas-fired boilers, an ash-handling system, as well as the two natural gas-fired boilers located a few blocks away at Hibbing High School that are connected to the HPUC steam distribution system. The five boilers are labeled Boiler No. 1A, Boiler No. 2A, Boiler No. 3A, High School Boiler No. 1, and High School Boiler No. 2.

Boilers 1A, 2A, and 3A are spreader stoker units that can burn subbituminous coal, and bituminous coal. Boilers 1A and 2A can also burn natural gas. Boilers 1A, 2A, and 3A are each equipped with their own electrostatic precipitator (for particulate matter control) and exhaust stack. This permit allows the facility to also burn used oil and oily paper-based sorbents (including oily rags) in Boilers No. 1A, 2A, and 3A. The stacks for Boilers 1A and 2A will be combined into a taller stack prior to the startup of a new wood fired boiler.

The high school boilers combust only natural gas. The High School boilers were constructed in 1972 and connected at that time to the HPUC steam heating system. The HPUC became the sole operator of these units in 1982. However, the change of operator was not considered a modification under New Source Review. Currently these natural gas-fired boilers are only operated a few days per year for emergency back-up. The majority of the steam heat for the school is supplied by the main HPUC boilers.

Boilers No. 1A and 2A are rated at 207 mmBtus (million Btu) per hour (145,000 lbs. of steam per hour). Boiler No. 3A is rated at 243 mmBtus per hour (170,000 lbs. of steam per hour). These are the 2-hour peak input capacities. Maximum continuous ratings are for Boilers 1A and 2A, 178.7 mmBtus per hour (125,000 lbs. of steam per hour), and for Boiler 3A, 214.4 mmBtus per hour (150,000 lbs. of steam per hour.) The High School Boilers are both rated at 36 mmBtus per hour (30,000 lbs. of steam per hour). None of the five boilers are subject to New Source Performance Standards.

Boilers 1A, 2A, and 3A, are individually equipped with continuous emission monitors (CEMs), for opacity, sulfur dioxide, and oxygen. The High School Boilers do not have any CEMs.

There are three steam-driven electric generating turbines at the facility with a total production capacity of 38 Megawatts.

Other air emission sources at the facility include a railcar/truck coal unloading station and an ash transfer system. The coal unloading station is considered an insignificant activity but will be included in the facility's fugitive dust control plan.

1.3 Description of the Activities Allowed By This Permit Action

This permit action is a reissuance of the Title V total facility operating permit that authorizes construction of an additional boiler and material handling equipment. Specifically, the permit authorizes the installation of a wood fired boiler to be used for district heating and electric generation. Also authorized with this permit action are the installation of wood handling and storage equipment.

The wood fired boiler is part of a larger project that includes a wood fired boiler at Virginia Public Utilities. Hibbing Public Utilities and Virginia Public Utilities have entered into a joint venture via formation of a third party, Laurentian Energy Authority (LEA), to generate electricity from biomass as required by an Xcel Energy purchase power agreement. LEA will lease the existing turbines to produce 15 MW at Virginia and 20 MW at Hibbing.

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

The facility was issued a Title V total facility air emissions permit on September 12, 1997, and Amendment No. 1 to that permit was issued on January 4, 2001.

Amendment No. 1, Action No. 002: (the first amendment to the Title V permit) was an administrative amendment to correct the control equipment listed for the ash conveying system The original permit incorrectly listed the control equipment as a fabric filter, whereas the system is actually controlled by dust suppression water spray. The permit amendment also established frequencies of testing for Boilers 1A, 2A, and 3A based on the margin of compliance recorded during performance testing. This permit specifies a stack testing frequency for all boilers based on the results of the most recent stack emissions testing. Because the tested emission rates were less than 60 percent of the Boiler's emission limit, stack testing is required once every five years.

Permit Type	Action Number	Application Date	Issue Date
Total Facility Operating Permit	001	09/13/1995	09/12/1997
Administrative Amendment	002	06/08/2000	01/04/2001

1.5. Facility Emissions:

Total Facility Potential to Emit Summary

	PM tpy	PM_{10} tpy	SO_2 tpy	NO_x tpy	CO tpy	VOC tpy	Single HAP tpy	*All HAPs tpy
New Wood Boiler Potential Emissions	25.19	15.19	25.19	151.1	403.0	17.13	20.1	
Total Facility Limited Potential Emissions	1841	330.9	4733	1683	1266	27.6	223.2	257.3
Total Facility Actual Emissions (2004)	122.9	31.8	373.7	364.7	207.2	2.07	HAPs not reported in emission inventory	

*Haps are primarily Hydrogen Chloride

Table 2. Facility Classification

Classification	Major/Affected Source	Synthetic Minor	Minor
PSD	PM, PM_{10}, SO_2, NO_x, CO		VOC, Pb
Part 70 Permit Program	PM_{10}, SO_2, NO_x, CO, HAPs		VOC
Part 63 NESHAP	Major		

2. Regulatory and/or Statutory Basis

New Source Review

The existing facility is a major source under new source review. The addition of the wood fired boiler exceeds significant emission increase levels for PM_{10}, NO_x, and CO. Accordingly, the facility was required to complete a Best Available Control Technology Analysis, and an Ambient Impacts Analysis for those pollutants. Those analyses are attached and are summarized below in Section 3.

Part 70 Permit Program

The facility is a major source under the Part 70 permit program.

New Source Performance Standards (NSPS)

The new wood fired boiler is subject to 40 CFR 60, Subp. Db. Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

National Emission Standards for Hazardous Air Pollutants (NESHAP)

All boilers are subject to NESHAP Standard 40 CFR 63, Subp. DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters.. The compliance date is upon startup for the new wood fired boiler. The compliance date for the existing boilers is September 13, 2007, and is specified in the permit.

Minnesota State Rules

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

Compliance Assurance Monitoring, (CAM) 40 CFR Part 64

The existing coal fired boilers, Boilers 1A, 2A, and 3A, are subject to requirements set forth in 40 CFR Part 64 for particulate matter and PM_{10}. The facility submitted CAM plans that focused on operation and maintenance of the electrostatic precipitators on those boilers. Staff proposed that the opacity limit set by the applicable standard (Minn. R. 7011.0510), and operation of the precipitators in a manner consistent with that during performance testing be set as permit conditions to satisfy the CAM requirements. This is similar to the compliance demonstration proposed in the applicable NESHAP standard, 40 CFR pt. 63, subp. DDDDD. Since the CAM regulations specifically exempt emission units from CAM if they are subject to a standard promulgated after November 5, 1990, (40 CFR § 64.2(b)(i)) staff determined that using a compliance demonstration method similar to Subp. DDDDD (promulgated in 2004), would satisfy the CAM criteria.

Table 3. Regulatory Overview of Facility

EU, GP, or SV	Applicable Regulations	Comments:
FC	Minn. R. 7009.0080	With this permit amendment, the facility completed PSD modeling for PM_{10}, NO_x, and CO. The permit also contains a requirement for the facility to demonstrate compliance with sulfur dioxide ambient standards. Previous Title V dispersion modeling was not performed consistently with MPCA policy.
FC	Minn. R. 7011.0150	Preventing particulate matter from becoming airborne
EU001-003, 005, and 006, Boilers 1A, 2A, 3A, HS1 and HS2	40 CFR pt. 63, subp. DDDDD	Compliance date is September 13, 2007. Applicable requirements will be added at that time, or at permit reissuance.
EU001-003, Boilers 1A, 2A, and 3A	40 CFR pt. 64	Compliance Assurance Monitoring for Particulate Matter and PM_{10}
GP001 Boilers 1A, 2A, and 3A	Minn. R. 7009.0080	Sulfur dioxide emission limits that ensure that the facility does not cause or contribute to a violation of the state sulfur dioxide ambient standard derived from previously performed modeling. However, as stated above, those limits may change with the required submittal of new dispersion modeling.
EU001-003 Boilers 1A, 2A, and 3A	Minn. R. 7011.0510 40 CFR § 52.21(k)	Standards of Performance for Indirect Heating Equipment PM_{10} limits used in the Ambient Impacts Analysis
EU004 Coal Ash Silo	Minn. R. 7011.0715 40 CFR § 52.21(k)	Standards of Performance for Industrial Process Equipment PM_{10} limits used in the Ambient Impacts analysis
EU005-006, HS Boilers	Minn. R. 7011.0510	Standards of Performance for Indirect Heating Equipment
EU007 Wood Fired Boiler	40 CFR pt. 60, subp. Db 40 CFR pt. 63, subp. DDDDD 40 CFR § 52.21	Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters, and Prevention of Significant Deterioration

EU008-11 and 13, Wood and ash handling equipment	Minn. R. 7011.0715 40 CFR § 52.21	Standards of Performance for Post Industrial Process Equipment. Prevention of Significant Deterioration
EU012 Generator	Minn. R. 7011.2300 40 CFR § 52.21	Standards of Performance for Internal Combustion Engines Prevention of Significant Deterioration
FS002 Truck Traffic	40 CFR § 52.21(k)	Impacts Analysis: Dust control measures.

3. Technical Information

3.1 Federal Prevention of Significant Deterioration Summary BACT Analyses:

Summary:

Emission Unit	Pollutant	Emission Limit	Control Technology
EU006 Wood Boiler	PM_{10}	0.025 lb/mmBtu	Electrostatic Precipitator
	NO_x	0.15 lb/mmBtu on a 30-day rolling average	Selective Non-Catalytic Reduction
	CO	0.3 lb/mmBtu on a 4-hour block average	Good Combustion Practices
EU007-10, 12 Wood and Wood Ash Handling	PM_{10}	0.002 gr/dscf	Fabric Filter
EU011 Emergency Generator	PM_{10}	0.14 lb/mmBtu	Good Combustion Practices
	NO_x	1.71 lb/mmBtu	Good Combustion Practices
	CO	0.85 lb/mmBtu	Good Combustion Practices

For all sources except the Emergency Generator, the top technically feasible option was chosen, and no financial analysis was necessary. For the Emergency Generator, controls were deemed unreasonably expensive except for ignition timing retard. (See attached BACT analysis). Ignition timing retard offers an opportunity to reduce NO_x emissions, but does so at the expense of engine efficiency. This would lead to increased fuel consumption, and corresponding increases in emissions of other pollutants, such as PM_{10}. The retarding of the engine spark can reduce engine stability, responsiveness to load demand and power output. LEA therefore suggested, and MPCA staff agreed, that combustion control/good engine design be designated as BACT for NO_x.

It is also possible to lower NO_x emissions by use of a heat exchanger to cool the inlet air. It is estimated that this method could achieve a 28 percent reduction in NO_x, however costs are prohibitive for an emergency unit with minimal runtime. In addition, the water cooling option will increase the fuel demand of the engine by approximately 10 percent. Therefore, the benefit of a 28 percent decrease in NO_x is offset by a 10 percent increase in fuel consumption.

3.2 Air Quality Analysis

The installation of the wood-fired boilers is considered a major modification to each of the existing utilities, which currently have Clean Air Act Amendment Title V operating permits. The wood-fired boiler and associated emission sources will be added to the existing permits for each municipal utility. The LEA Biomass Energy Project does not modify or change the method of operation of any currently existing emission units.

The proposed boilers will be constructed in an area that is attaining the National Ambient Air Quality Standards (NAAQS), or is not designated. This means that federal New Source Review (NSR) Prevention of Significant Deterioration (PSD) rules must be evaluated for applicability. PSD is the permitting process by which U.S. Environmental Protection Agency (EPA), through MPCA, ensures that areas with good air quality are not degraded due to new development. Based upon total project potential emissions, PSD review is required for PM, Particulate Matter smaller than 10 microns (PM_{10}), NO_x and CO. PSD permitting requires demonstration of compliance with national ambient air quality standards based on refined air dispersion modeling, analysis of additional impacts such as growth, and a Class I area impact analysis. Class I areas are areas of special national or regional natural, scenic, recreational, or historic value for which the PSD regulations are intended to provide special protection. Two Class I areas are within the review area for this project, Voyageurs National Park and the Boundary Waters Canoe Area Wilderness.

The results of the impact analysis for the Class I areas are presented below. The LEA Biomass Energy Project was shown to not have a significant impact to either Class I area.

Predicted Impact to Class I Areas for LEA Biomass Energy Project Virginia

Pollutant	Significant Impact Threshold (ug/m3)	Voyageurs National Park (ug/m3)	Boundary Waters Canoe Area (ug/m3)
PM_{10} – 24-hr standard	0.3	0.02268	0.07272
PM_{10} – Annual standard	0.2	0.00148	0.00338
NO_x – annual standard	0.1	0.00682	0.01448

Predicted Impact to Class I Areas for LEA Biomass Energy Project Hibbing

Pollutant	Significant Impact Threshold (ug/m3)	Voyageurs National Park (ug/m3)	Boundary Waters Canoe Area (ug/m3)

PM_{10} – 24-hr standard	0.3	0.01940	0.03553
PM_{10} – Annual standard	0.2	0.00112	0.00107
NO_x – annual standard	0.1	0.00521	0.00502

The modeling indicated there are no significant impacts for CO or NO_x, so additional modeling for these pollutants did not need to be performed. PM_{10} did have predicted impacts over EPA significance thresholds so air dispersion modeling was performed to demonstrate that the additional emission of PM_{10} from this project combined with all other major sources in the area (50 kilometer radius) did not contribute to an exceedance of a NAAQS standard or PSD increment allowance.

The impacts from all facilities have been evaluated for their cumulative impacts by means of the prescribed EPA model, and the total impact is compared to PSD increment and NAAQS standards. The tables below present a summary of the NAAQS compliance analysis, and summarize PSD increment consumption. The predicted impacts are all below the NAAQS standards and PSD increment standards.

Laurentian Energy Authority Biomass Energy Project NAAQS Compliance Summary

Pollutant	NAAQS ug/m^3	Hibbing and ALL Known Contributors ug/m^3	Virginia and ALL Known Contributors ug/m^3
PM_{10} - annual	50	45.99353	31.64045
PM_{10} – 24 hour	150	130.82701	126.99362

Laurentian Energy Authority Biomass Energy Project PSD Increment Consumption

Pollutant	Class II PSD Increment Standard ug/m^3	Hibbing and ALL Known Contributors ug/m^3	Virginia and ALL Known Contributors ug/m^3
PM_{10} - annual	17	6.06523	4.09146
PM_{10} – 24 hour	30	18.07928	24.63900

Air Impact Summary

The analysis competed as part of this assessment indicates that the proposed LEA Biomass Energy Project will not adversely affect the ambient air quality in the area.

However, during the review for the LEA Biomass Energy Project it was discovered that the historical SO_2 limits at Hibbing might not have been as protective of ambient air quality as would be desired for the existing coal-fired boilers. To address this, the following actions will be undertaken:

1. **Reduced SO_2 emissions limit.** The Hibbing Public Utility has requested an SO_2 emission limit of 1.58 lb/mmbtu per boiler under any and all combinations of boiler operation. This emission limit is reduced from historical limits when the facility is operating only one or two of the coal-fired boilers. This limit is identical to historical limits when all three coal-fired boilers are operating.

2. **New stack configuration.** The exhaust from boilers 1A and 2A will be combined into a single (42-foot taller) stack that will provide for lower concentrations of SO_2. This provides for improved stack gas dispersion and exit velocities, which in turn will lead to lower concentrations of SO_2 in the outside air.

3. **Complete up-to-date modeling of SO_2 concentrations.** The SO_2 emissions from the facility have been modeled to current EPA and MPCA standards in order to demonstrate the effectiveness of the proposed changes. Model results are summarized in the table below.

4. **Create a permit condition.** The changes described above will be placed into the permit for the Hibbing facility as a legally binding condition. The changes must be completed prior to startup of the LEA Biomass Energy Project.

Hibbing Public Utility SO_2 NAAQS and MAAQS Compliance Summary*

Averaging Period	NAAQS and MAAQS ug/m^3	Hibbing and All Other Sources** ug/m^3
1-Hour	1300	1169
3-Hour	915	866
24-Hour	365	350
Annual	60	21

*for SO_2, facilities must meet both National Ambient Air Quality Standards and the Minnesota Ambient Air Quality Standard
(1-hour average)
**impacts of all other sources are included through use of MPCA background concentrations that represent their contributions

3.3 Additional Impacts Analysis

Additional Impact Analysis

The additional impact analysis refers to completion of an environmental review which is not the same as the ambient air quality analysis discussed in Section 3.3. The environmental impact refers to review of such items as the solid or hazardous waste generation, discharges of water from a control device, visibility impacts, or emission of unregulated pollutants.

In Minnesota, new sources of emissions that have the potential to emit more than 100 tons per year of a criteria pollutant are required to complete an Environmental Assessment Worksheet (EAW). The elements of the EAW address the issues identified as part of PSD review. Please refer to the EAW submitted for this project for additional information on the environmental impact from this facility. The environmental impact issues as specified by PSD are discussed in the sections that follow.

Growth Analysis

No growth is expected from the LEA project, only maintenance of current. LEA will contract with HPU to operate and maintain the wood fired boiler. LEA will not employ any additional staff beyond what is already required to operate the existing HPU facility.

Without LEA, HPU claims it is faced with the inevitability that its existing operation is becoming no longer cost effective and at some point the district heating system would be closed. Closure will result in loss of employment for the personnel currently operating the HPU plant.

In addition, instead of a centralized facility providing steam for hot water and building heat (commercial, institutional, and residential), existing customers would be force to install alternative means for comfort heating and hot water. The impact of the numerous individual heating units required to displace the existing heating source would have environmental effects.

If any job growth would result in the formation of LEA, it may be in the area of forestry and logging, however, it is more likely that workers displaced from losses in this industry would be reactivated to serve LEA. Because no growth is expected to result from this project, no growth analysis has been completed.

Soils and Vegetation Analysis

LEA project impacts are largely covered in the EAW submitted under separate cover. Per MPCA direction, no detailed analysis of soils and vegetation impacts has been undertaken. However, dispersion modeling has shown that the ambient air impacts of emissions from the LEA facility are below both the primary and secondary NAAQS. Therefore, no significant adverse impact is predicted for soils and vegetation as a result of the LEA project.

Visibility Impairment Analysis

No visibility analysis is required based on direction received from Minnesota Pollution Control Agency and Federal Land Managers.

3.4 Air Emissions Risk Analysis (AERA) Analysis

MPCA policy is to prepare an AERA as a part of the EAW process. When the potential human health risks have been calculated, the procedure is to present the AERA to the MPCA Risk Managers for a decision on the feasibility of proceeding with the project. The results of this analysis are presented below.

After consideration of all of the information provided in this AERA, the MPCA Risk Managers conclude that the facility air emission risk analysis is adequate to assess the impacts and that the air emissions that are reasonably expected to be generated from this facility with the addition of the wood-fired boiler will not cause significant environmental or health impacts.

The facility as proposed increases toxic air emissions and in some cases the impact is above risk thresholds. However, the fact that the two existing stacks for the facility will be replaced by a new stack that is 42 feet taller, as well as the inherently conservative nature of the analysis, form the basis for the conclusion by the Risk Managers that the facility will not have significant environmental or health impacts.

Examples of factors taken into consideration and related to the specific risk drivers, in addition to the increase in stack height, include the following:

- Use of surrogate toxicity values for chromium compounds, arsenic compounds and dioxins and furans which overstate the impact;
- The assumption that 100 percent of the NO_x coming from the stack is NO2;
- Limited or no farming within 3 kilometers of the facility;
- The use of conservative modeling versus more refined modeling;
- Reduction in total mercury from the two facilities in the Laurentian project as a whole; and
- The objectives set forth by the Legislature to increase the use of alternative fuels with a focus on renewable energy.

Mercury Emissions

A mercury analysis is part of the AERA. Over the 20 year life of the PPA, the decrease in coal usage results in a reduction of approximately 15.7 pounds of mercury. This decrease does not occur without the LEA Biomass Energy Project.

3.5 Emission Calculations:

Potential emissions are calculated by using emission limits combined with full capacity operation for those pollutants with emission limits, and emission factors combined with full capacity operation for those pollutants without emission limits.

The database used for the new wood fired boiler came from EPA's Background Information for Section 1.6 of AP42, Wood Residue Combustion. Test data for all pollutants was averaged for all sources that had high efficiency particulate control, as it was assumed that those factors would be most accurately predictive of potential emissions from the new wood fired boiler. Some of the facilities tested had no control, cyclone control, or wet scrubbers. Data from those facilities was not used in developing average emission factors. In addition to not being similarly controlled, those boilers are most likely older than the better controlled boilers, and hence may be less efficient in relation to combustion.

AP42 factors from Section 1.1, Coal Combustion, were used to calculate emissions from the existing coal boilers. Previous information listed the boiler heat inputs for all boilers at the 2-hour heat capacity at 216, 216, and 248 mmBtus per hour for Boilers 1A, 2A, and 3A. Actual maximum heat inputs are 207, 207, and 243 mmBtu per hour. That capacity is attainable on a 2-hour basis only. Maximum continuous rating (usually used in emission calculations) is 178, 178, and 214 mmBtus per hour. Thus, the calculations are somewhat of an overestimate of potential emissions, and all analyses are conservative.

For the material handling baghouses, the BACT emission limits were used to calculate potential particulate and PM_{10} emissions.

For traffic emissions, AP42 equations from Section 13.2.1, Paved Roads, were used to calculate emissions. The number of fuel delivery trucks, and ash removal trucks were determined by assuming full capacity operation of all boilers, and the resulting fuel consumption and ash generation, along with the load capacity for each truck.

For fugitive emissions from material handling, EPA's AP42 Section 13.2.4, Aggregate Handling and Storage Piles equations were used. Again, the amount of material handled was derived by assuming full capacity operation of all boilers.

3.6 Periodic Monitoring

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

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

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

The table below summarizes the periodic monitoring requirements for those emission units for which the monitoring required by the applicable requirement is nonexistent or inadequate.

Periodic Monitoring

Emission Unit or Group	**Requirement (basis)**	**Additional Monitoring**	**Discussion**
GP001 Boilers 1A, 2A and 3A SO_2 limits and fuel use limits	2.06 lb SO_2/mmBtu when two boilers are operating, and 1.58 lb SO_2/mm Btu when three are operating, and 4 lb SO_2/mmBtu when one is operating.	CEM	CEMs data should demonstrate continuous compliance with the emission limits Daily recordkeeping of used oil burned and oily rags. Monthly calcualation.
EU001-EU003, Boilers 1A, 2A and 3A SO2 limits and fuel use limits	1.58 lb/mmBtu after startup of the wood fired boiler and after new stack is constructed	CEM	CEMs data should demonstrate continuous compliance with the emission limits

EU001-003, Boilers 1A-3A	PM, PM_{10}, Opacity, Sulfur dioxide	COM, SO_2 CEM, stack emissions testing, restrictive opacity limit, and monitoring of the control equipment	Monitoring was set similarly to that established by the recently promulgated Boiler MACT for PM_{10}. SO_2 CEMS and COM should ensure continuous compliance with those pollutant limits.
GP002 Material Handling Baghouses	Operation while emission sources are in operation and BACT emission limit	Visible emissions check, pressure drop check, stack emissions testing of one of the baghouses with the highest particulate loading	Permit also specifies inspection and maintenance. Proper operation and maintenance of the baghouses should ensure that PM limits are met for the smaller material handling sources.
EU004 Coal Ash Silo	Minn. R. Particulate Limit and PM_{10} limit based on Ambient Impacts	No visible emissions, daily visible emissions check, operation and maintenance of the baghouse	
EU005-006 H.S. Boilers	Minn. R. Particulate and Opacity Limit	Fuel use restriction	Limit to natural gas should ensure compliance with applicable limits.
EU007 Wood Fired Boiler	BACT and NESHAP Limits on PM, Opacity, CO, HCl, NO_x and mercury	Opacity, CO, and NO_x CEMS, stack emission testing, operation of control equipment as during stack emission testing	Recently promulgated standard, subp. DDDDD sets most of the compliance demonstration

3.7 Insignificant Activities

Hibbing Public Utilities has several operations which are classified as insignificant activities. These are listed in Appendix to the permit.

3.8 Comments Received and Response

Public Notice Period: April 29, 2005 through May 31, 2005.
EPA 45-day Review Period: April 29, 2005 through June 13, 2005.

One comment letter was received during the public comment period. That letter expressed support for the project, and did not request any changes be made to the permit.

4. Conclusion

Based on the information provided by Hibbing Public Utilities, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 13700028-005, and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Jenny Reinertsen (permit writer/engineer)
Robert Beresford (enforcement)
Marshall Cole (peer reviewer)
Dave Beil (peer reviewer)

Attachments:

- BACT Analyses
- Air Quality Impact Analysis - Analysis of existing air quality, PSD increment analysis.
- Additional Impact Analysis
- RASS/AERA.
- Emission calculations

BACT Analyses
Source: Permit Application

BACT Analysis

The BACT determination has been compiled in accordance with the Top-Down BACT procedure and guidance from the DRAFT New Source Review Manual (October 1990). The RBLC database was reviewed for similar installations. Control options are then ranked from high to low control efficiencies, and technical and economic feasibilities are discussed.

RBLC Database Review

A search of the RBLC database was conducted on 8/19/2004. The RBLC database is a centralized location for BACT determination information from across the U.S. Two source categories were searched for applicable BACT determinations: 11.120 Utility Biomass Boilers and 12:120 Industrial Biomass Boilers. These lists were then pared down to develop a list of permitted processes most representative of the LEA wood-fired boiler. The BACT limitations found in the database are summarized in Table 11.

Table 11

Summary of RBLC Database Entries for Wood-Fired Boilers

RBLC ID	Company	Boiler Size MMBtu/hr	Pollutant	Limit	Units	Technology	Date
VA-0268	Martinsville Thermal	120	PM_{10}	0.14	Lb/MMBtu	Combustion Control/CEM	02/15/2002
OH-0269	Biomass Energy LLC	175	PM_{10}	0.017	Lb/MMBtu	Fabric filter	02/07/2002
CA-0930	Sierra Pacific	245.3	PM_{10}	0.035	Lb/MMBtu	Multi-clone/ESP	05/13/1998
AR-0073	Potlatch Corp	159.29	PM	0.10	Lb/MMBtu	Multi-clone/ESP	09/08/1995
MS-0023	Georgia Pacific	244	PM_{10}	0.10	Lb/MMBtu	None	04/11/1995
WA-0298	Sierra Pacific	310	PM	0.2	Lb/MMBtu	ESP	10/17/2002
KY-0085	Mead Westvaco	631	PM	0.1	Lb/MMBtu	ESP	02/27/2002
MN-0046	District Energy St Paul	550	PM	0.03	Lb/MMBtu	Cyclone/ESP	11/15/2001
ME-0026	Wheelabrator Sherman	315	PM	0.036	Lb/MMBtu	Cyclone/ESP	04/09/1999
NY-0055	Boralex Chateaugay	275	PM_{10}	0.038	Lb/MMBtu	Multi-clone/ESP	12/19/1994
VA-0268	Martinsville Thermal	120	NOx	0.4	Lb/MMBtu	Combustion Control/CEM	02/15/2002
OH-0269	Biomass Energy LLC	175	NOx	0.14	Lb/MMBtu	SCR	02/07/2002
CA-0930	Sierra Pacific	245.3	NOx	0.23	Lb/MMBtu	SNCR	05/13/1998
AR-0073	Potlatch Corp	159.29	NOx	0.25	Lb/MMBtu	Boiler Design and operation	09/08/1995
MS-0023	Georgia Pacific	244	NOx	0.3	Lb/MMBtu	None	04/11/1995
AR-0072	Del-Tin Fiber	291	NOx	0.3	Lb/MMBtu	Low NOx and SNCR	02/28/2003
WA-0298	Sierra Pacific	310	NOx	0.15	Lb/MMBtu	Boiler design/SNCR	10/17/2002
KY-0085	Mead Westvaco	631	NOx	0.4	Lb/MMBtu	None	02/27/2002
MN-0046	District Energy St Paul	550	NOx	0.15	Lb/MMBtu	SNCR	11/15/2001
ME-0026	Wheelabrator Sherman	315	NOx	0.25	Lb/MMBtu	Combustion Control	04/09/1999
NY-0055	Boralex Chateaugay	275	NOx	0.23	Lb/MMBtu	None	12/19/1994
VA-0268	Martinsville Thermal	120	CO	0.44	Lb/MMBtu	Combustion Control/CEM	02/15/2002
OH-0269	Biomass Energy LLC	175	CO	0.011	Lb/MMBtu	Oxidation Catalyst	02/07/2002
CA-0930	Sierra Pacific	245.3	CO	1.15	Lb/MMBtu	High pressure overfire air	05/13/1998

AR-0073	Potlatch Corp	159.29	CO	1.35	Lb/MMBtu	Proper Design and operation	09/08/1995
MS-0023	Georgia Pacific	244	CO	0.69	Lb/MMBtu	None	04/11/1995
AR-0072	Del-Tin Fiber	291	CO	0.78	Lb/MMBtu	Combustion Control	02/28/2003
WA-0298	Sierra Pacific	310	CO	0.35	Lb/MMBtu	Combustion Control	10/17/2002
MN-0046	District Energy St Paul	550	CO	0.3	Lb/MMBtu	Combustion Control	11/15/2001
ME-0026	Wheelabrator Sherman	315	CO	0.45	Lb/MMBtu	Combustion Control	04/09/1999
NY-0055	Boralex Chateaugay	275	CO	0.35	Lb/MMBtu	None	12/19/1994

PM_{10} Controls and Emission Limits from RBLC Database

Particulate matter controls from the RBLC database records indicate a predominance of ESP as the BACT control technology, often in combination with multi-clones. Select cases utilize a fabric filter (OH-0269) or combustion control (VA-0268). BACT emission rates range from 0.017 to 0.20 pounds per million Btu, with the fabric filter controlled source (OH-0269) representing the lower end of the range. Consultation with the permitting agency, Ohio EPA indicates that this facility has never been constructed and the permit has expired. The next lowest BACT emission rate is 0.03 lbs/MMBtu from the District Energy St Paul facility utilizing multi-clone and ESP controls.

NO_x Controls and Emission Limits from RBLC Database

Nitrogen oxide controls from the RBLC database records indicate a wide range of technologies as BACT, including no control, combustion control, SNCR and SCR. Again the most stringent control, SCR appears in the permit for RBLC record OH-0269, however that facility has not been constructed and the permit has expired. BACT emission rates range from 0.15 to 0.40 pounds per million Btu, excluding OH-0269 which has not been constructed. The lowest BACT emission rate for a constructed and operating facility is 0.15 lbs/MMBtu from the District Energy St Paul facility which employs SNCR technology.

CO Controls and Emission Limits from RBLC Database

Carbon monoxide controls from the RBLC database records indicate a predominance of combustion control as BACT. One determination was made for oxidation catalyst, however that facility (OH-0269) has not been constructed and the permit has expired. BACT emission rates range from 0.3 to 1.35 pounds per million Btu. The lowest BACT emission rate for a constructed and operating facility is 0.3 lbs/MMBtu from the District Energy St Paul facility which employs combustion control. However that emission limit has apparently not yet been met by the facility.

Summary of BACT Review Results

The RBLC review indicates BACT control technology and emission rate limitations as summarized in Table 12

Table 12
RBLC BACT Control Technology and Emission Rate Limitations.

Pollutant	Control Technology	Emission Limitation
PM_{10}	Multi-clone + ESP	0.03 lbs/MMBtu
NO_x	SNCR	0.15 lbs/MMBtu
CO	Combustion Control	0.3 lbs/MMBtu

LEA BACT for Nitrogen Oxide Control

The Top-Down BACT determination procedure requires development of a list of potential control technologies, ranked from highest control efficiency to lowest. The technologies are then reviewed, beginning with the most highly-ranked option, for technical feasibility. Those technologies that are deemed technically feasible are then reviewed, again beginning with the most effective technology, for economic feasibility. The best-performing option that meets both technical and economic feasibility is then presumed to be BACT for the project.

Ranking of Control Technologies

As can be seen in Tables 11 and 12, the use of Selective Noncatalytic Reduction (SNCR) is the standard of technology employed to control NO_x emissions from wood-fired boilers.

In general, NOx control for solid fuel boilers may make use of Selective Catalytic Reduction (SCR), SNCR, or low-NO_x firing configurations including reburn. Table 13 provides a list of NO_x control options and their associated control efficiencies.

Table 13
Ranking of Control Technologies for NOx Reduction

Control Technology	EPA Efficiency Range (%)
Selective Catalytic Reduction	70-90%
Selective Noncatalytic Reduction	30-50%
Combustion Control	30%

Technical Feasibility Analysis

Selective Catalytic Reduction (SCR) is the highest-performing control option in the top-down hierarchy. SCR makes use of a catalyst with ammonia injection. The catalyst improves the efficiency of the chemical reduction of NO_x by ammonia. The SCR is designed to evenly distribute the flow of NO_x across a catalyst surface, also providing thorough mixing of the injected ammonia to facilitate reduction and thus removal of NO_x. Our review of the potential use of SCR for control of NOx from the LEA boiler finds that SCR has been uniformly rejected as a technically infeasible control option for wood-fired boilers. The

higher levels of silicates and other constituents found in biomass fuels leads to rapid fouling of the catalyst bed, greatly reducing the effectiveness of the SCR system, and leading to significant down time and expense in replacing the catalyst. It is for this reason that reviewing agencies have historically concurred that SCR is not technically feasible for wood-fired boilers.

Selective Noncatalytic Reduction (SNCR) does not make use of catalysts to produce the reduction reaction. As such, the fouling problems that plague SCR systems do not occur with SNCR. SNCR is the top control option for control of NO_x for wood-fired boilers. LEA proposes adoption of this top technically feasible option as BACT, with an emission rate limit of 0.15 lbs per MMBtu.

LEA BACT for Carbon Monoxide Control

Options for controlling carbon monoxide emissions from solid fuel boilers are limited. Although catalysts can be used in automobiles and in some gas or oil-burning stationary engines, the catalyst fouling problems that plague SCR systems also make catalysts technically infeasible for solid fuel boilers. As illustrated in Tables 11 and 12, Combustion Control, the maintenance of good combustion practices, has been the universal BACT selection for control of CO emissions. LEA proposes adoption of the top technically feasible option of combustion control as BACT, with an emission rate limit of 0.4 lbs/MMBtu.

LEA BACT for PM10 Emission Control (Wood-Fired Boiler)

Table 14 provides a list of potential particulate control options for wood-fired boilers. The stoker boiler proposed for LEA will incorporate multiclones for removal of gross particulate and will follow the multiclone with an Electrostatic Precipitator (ESP). LEA proposes adoption of this option as BACT for PM_{10} control.

Table 14
Ranking of PM10 Control Options

Control Technology	EPA Efficiency Range (%)
Multi-clone + Fabric filter	99.9 +
Multi-clone + ESP	99 +
Fabric filter	95-99.9
ESP	90-99
Multi-clone	30-90

The LEA boiler is being designed with multiclones. Questions have arisen as to the feasibility of utilizing the top particulate control, a fabric filter, due to threat of fire from carbonaceous ash and the potential for glowing embers to reach the fabric filter. Although several past BACT determinations, including District Energy St Paul, indicated that the fabric filter was technically infeasible due to fire concerns, LEA originally requested bids based upon inclusion of a fabric filter.

The vendors responding to the solicitation uniformly indicated that the threat of fire in the baghouse was an overwhelming concern that made the option infeasible. It is for this reason that LEA is proposing to adopt the multiclone-ESP combination as BACT for the wood-fired boiler. Documentation of vendor concerns with the fabric filter have been previously forwarded to MPCA for review.

BACT for PM_{10} Emission Control (Wood Handling Operations)

LEA proposes to select the top control option, a fabric filter, for each vented emission point in the wood handling system. This includes the Wood Receiving Operation, Wood Conveying, Wood Storage (2 bin vents), Wood Metering Bin, and Ash Silo exhausts. An emission rate limit of 0.002 gr/scf is proposed as BACT for each emission point.

BACT for PM_{10} Emission Control (Fugitive Dust)

The LEA facility is being constructed on an existing site which already consists of paved ground. Truck traffic will occur to receive wood chips and to haul away ash from the ash storage silo. Fugitive emissions will also arise when discharging ash from the ash silo into trucks.

Road Dust Sources

The wood receiving and ash hauling traffic will transit paved ground as described earlier. BACT options then focus on reduction of silt loading on the paved areas. Dust control can be accomplished through washing and sweeping of the roadways (while temperatures allow washing without creating a safety hazard.) Table 15 summarizes the effectiveness of the various options.

Table 15
Fugitive Dust Control Options for Paved Roadways

Control Option	EPA Efficiency Range (%)*
Water Flushing and Sweeping	96% or less
Water Flushing	69% or less
Vacuum Sweeping	46 – 58%
Sweeping	25 – 30%

**Efficiency values taken from "Air Pollution Engineering Manual", First Edition, Table 5, page 145.*

Given the harsh climate in which LEA will operate, the application of water to roadways poses serious safety concerns during much of the year.

The facility proposes to accept a semi-monthly washing and sweeping schedule to reduce silt loading on the facility road surfaces, using city-owned street sweepers. It is estimated that this schedule will provide approximately 50 percent reduction in road silt contents on the paved surfaces. In addition, LEA proposes the posting of a 5 mph speed limit for on site truck traffic to reduce dust generation.

3.2.7.2 Ash Loadout

Bottom and fly ash from the wood-fired boiler will be conveyed to an ash silo for on-site storage. Up to 200 trucks per year will be needed to remove the ash from the silo and transport it to a handling area off-site. Fugitive dust from the ash loadout will be suppressed through the incorporation of water with the ash as it is unloaded into the trucks.

3.2.8 BACT for Diesel-Fired Emergency Generator

Per MPCA direction, BACT for the emergency generator is also investigated for NO_x, CO and PM_{10} control. Table 16 provides a list of potential NO_x control methods for the emergency generator. Control efficiency for Selective Catalytic Reduction is taken from an Air Pollution Control Technology Fact Sheet from the EPA CATC website. Emission reduction estimate for Ignition Timing Retard is taken from "Alternative Control Techniques (ACT) Document - Internal Combustion NO_x Part 1 & 2" also found on the CATC website. Control efficiency for cooling water addition to reduce NO_x formation is from emission rate information provided by an engine manufacturer.

Table 16
Ranking of Control Technologies for NO_x Reduction

Control Technology	EPA Efficiency Range (%)
Selective Catalytic Reduction	70-90%
Cooling Water	28%
Ignition Timing Retard	~25%
Combustion Control	-

Table 17 provides a listing of control options for reducing emissions of carbon monoxide. The control efficiency for the oxidation catalyst is taken from the recent MACT discussion for reciprocating internal combustion engines.

Table 17
Ranking of Control Technologies for CO Reduction

Control Technology	EPA Efficiency Range (%)
Oxidation Catalyst	93%
Combustion Control	-

Table 18 provides a listing of control options for reducing emissions of PM_{10}. Control efficiencies are taken from EPA Air Pollution Control Fact Sheets.

Table 18

Ranking of Control Technologies for PM10 Reduction

Control Technology	EPA Efficiency Range (%)
Fabric Filter	95-99.9%
Electrostatic Precipitator	90-99.9%
Wet Scrubber – Packed Bed	70-99%
Wet Scrubber - Venturi	70-99%
Low Ash Fuel	-

Table 19 provides a summary of BACT decisions contained in the RBLC Database. BACT decisions dating back through 2002 are included in the summary.

Table 19

Summary of RBLC Database Entries for Emergency Generators

RBLC ID	Company	Generator Size (kW)	Pltnt	Limit	Units	Technology	Date
AR-0076	U.S. Army, Pine Bluff Arsenal	2500	PM_{10}	1.1	Lb/hr	None	02/17/2004
OK-0091	Cardinal Mfg	2000	PM_{10}	0.0444	Lb/MMBtu	Combustion Control	03/18/2003
IA-0067	MidAmerican Energy	1400	PM_{10}	0.14	Lb/MMBtu	Combustion Control	06/17/2003
OK-0090	Duke Energy	500	PM_{10}	0.124	Lb/MMBtu	Combustion Control	03/21/2003
TX-0407	STEAG Power LLC	~1000	PM_{10}	2.97	Lb/hr	None	12/06/2002
IA-0060	Entergy	unknown	PM_{10}	0.34	Lb/hr	Good Combustion, Timing Retard	07/23/2002
MS-0055	El Paso Merchant Energy Co.	1735	PM_{10}	-	-	VE limit only, 60 hrs/yr operation	06/24/2002
OK-0070	Genova Oklahoma LLC	750	PM_{10}	0.033	Lb/MMBtu	Combustion Control	06/13/2002
SC-0064	SCE&G	2000	PM_{10}	1.9	Lb/hr	Combustion Control, Low sulfur fuel	05/23/2002
IA-0058	MidAmerican Energy	700	PM_{10}	0.95	Lb/hr	None	04/10/2002
AR-0076	U.S. Army, Pine Bluff Arsenal	2500	NO_x	0.0182	g/Bhp-hr	None	02/17/2004
OK-0091	Cardinal Mfg	2000	NO_x	2.035	Lb/MMBtu	Combustion Control	03/18/2003
IA-0067	MidAmerican Energy	1400	NO_x	1.71	Lb/MMBtu	Timing Retard	06/17/2003
OK-0090	Duke Energy (not constructed)	500	NO_x	2.16	Lb/MMBtu	Combustion Control, Hour of Operation Limits	03/21/2003
TX-0407	STEAG Power LLC	~1000	NO_x	14.0	g/Bhp-hr	None	12/06/2002
IA-0060	Entergy	unknown	NO_x	10.61	Lb/hr	Good Combustion, Timing Retard	07/23/2002

OK-0070	Genova Oklahoma LLC	750	NO_x	3.01	Lb/MMBtu	Combustion Control	06/13/2002
SC-0064	SCE&G	2000	NO_x	59.5	Lb/hr	None	05/23/2002
OK-0072	Redbud Energy LP	~1500	NO_x	0.024	Lb/Bhp-hr	None	05/06/2002
IA-0058	MidAmerican Energy	700	NO_x	22.69	Lb/hr	Ignition Timing Retard	04/10/2002
OK-0091	Cardinal Mfg	2000	CO	0.202	Lb/MMBtu	Combustion Control	03/18/2003
TX-0407	STEAG Power LLC	~1000	CO	3.03	g/Hp-hr	None	12/06/2002
IA-0067	MidAmerican Energy	1400	CO	0.85	Lb/MMBtu	Combustion Control	06/17/2003
OK-0090	Duke Energy	500	CO	2.66	Lb/MMBtu	Combustion Control	03/21/2003
IA-0060	Entergy	unknown	CO	0.22	Lb/hr	Good Combustion, Timing Retard	07/23/2002
OK-0070	Genova Oklahoma LLC	750	CO	0.31	Lb/MMBtu	Combustion Control	06/13/2002
SC-0064	SCE&G	2000	CO	15.8	Lb/hr	None	05/23/2002
OK-0072	Redbud Energy LP	~1500	CO	0.055	Lb/Bhp-hr	Combustion Control	05/06/2002
IA-0058	MidAmerican Energy	700	CO	2.86	Lb/hr	None	04/10/2002

3.2.8.1 PM_{10} Control Option Selection

As can be seen in Table 19, PM_{10} controls from recent BACT decisions have ranged from no control to good combustion practices/engine design. One engine, of unknown size applied timing retard. Economic analysis is conducted on each of the technically feasible control options to determine cost-effectiveness of control. This computation is summarized in Table 20.

Table 20
Summary of PM_{10} Control Cost Effectiveness for Emergency Generator

Technology	Removal Efficiency (%)	Minimum Capital Cost ($/scfm)*	Minimum O&M Cost ($/scfm)	Scfm	Unctrl TPY	Ctrl TPY	Cost Effectiveness ($/ton)**
Fabric Filter	99.9	6	5	4878	0.356	0.000356	$68,580
ESP	99.9	10	3	4878	0.356	0.000356	$41,148
Packed Bed Scrubber	99	11	15	4878	0.356	0.00356	$207,610
Venturi Scrubber	99	2.5	4.4	4878	0.356	0.00356	$60,899
Low Ash Fuel #	-	-	-	-	-	-	-

**taken from CATC Air Pollution Control Fact Sheets*
***Using O&M costs only. Annualization of capital costs not included*
 # facility already committed to using low sulfur fuel oil

From the simple analysis presented in table 20, it is clear that add-on control technologies for removal of particulate emission from the emergency generator is not cost effective. The generator is proposed with a 500 hour/year operating limitation, as well as use of low sulfur fuel oil.

3.2.8.2 NOx Control Option Selection

As can be seen in Table 19, NO_x controls from recent BACT decisions have ranged from no control to good combustion practices/engine design. One engine, of unknown size applied timing retard. Economic analysis is conducted on each of the technically feasible control options to determine cost-effectiveness of control. This computation is summarized in Table 21.

Table 21

Summary of NO_x Control Cost Effectiveness for Emergency Generator

Technology	Removal Efficiency (%)*	Annual Cost ($/year)*	Unctrl TPY	Ctrl TPY	Cost Effectiveness ($/ton)
SCR	90	$92,220	11.4	1.14	$8,988
Cooling Water	28	$30,399	11.4	8.21	$9,523**
Ignition Timing Retard	25	$7,306	11.4	8.55	$2,564
Combustion Control	-	-	-	-	-

**ignition timing retard efficiency and all cost values taken from the EPA Document,'Alternative Control Techniques – Internal Combustion NOx', page 5-14*

***Cost analysis does not include the increased cost of fuel for the water cooling option. Water cooling will increase the hourly fuel consumption by 10.2 gallons per hour.*

It is possible to lower NO_x emissions by use of a heat exchanger to cool the exhaust. It is estimated that this method could achieve a 28 percent reduction in NO_x; however costs are prohibitive for an emergency unit with minimal runtime. In addition, the water cooling option will increase the fuel demand of the engine by approximately 10 percent. Therefore, the benefit of a 28 percent decrease in NO_x is offset by a 10 percent increase in fuel consumption. Hibbing costs are projected to be higher than at Virginia because cooling tower water would have to be run through a chiller to lower water termperature prior to use.

Ignition timing retard offers an opportunity to reduce NO_x emissions, but does so at the expense of engine efficiency. This would lead to increased fuel consumption, and corresponding increases in emissions of other pollutants, such as PM10. The retarding of the engine spark can reduce engine stability, responsiveness to load demand and power output. LEA therefore suggests that combustion control/good engine design be designated as BACT and the vendor-guaranteed emission rate of 2.88 lbs/MMBtu be accepted as BACT for NO_x.

3.2.8.3 CO Control Option Selection

As can be seen in Table 19, CO controls from recent BACT decisions have ranged from no control to good combustion practices/engine design. One engine, of unknown size applied timing retard, however the less than optimum combustion with timing retard, more CO can be expected. Economic analysis is conducted on each of the technically feasible control options to determine cost-effectiveness of control. This computation is summarized in Table 22.

Table 22
Summary of CO Control Cost Effectiveness for Emergency Generator

Technology	Removal Efficiency (%)*	Annual Cost ($/year)**	Unctrl TPY	Ctrl TPY	Cost Effectiveness ($/ton)
Oxidation Catalyst	93	$129,240	3.03	0.21	$45,864
Combustion Control	-	-	-	-	-

**taken from RICE MACT documentation*
***costs taken from vendor quote for RICE MACT development 8.27.1998*

Cost information for oxidation catalyst applications are difficult to locate. The OAQPS Control Cost Manual does not provide estimates for CO control systems, however, cost data were located in the docket for development of the Reciprocating Internal Combustion Engine (RICE) MACT. Cost figures for the oxidation catalyst were pulled from documents in the RICE MACT docket. LEA proposes that combustion control/good engine design be considered BACT for the emergency generator for CO.

Ambient Impacts Analysis
Source: Permit Application

Ambient Air Quality Analysis

Air dispersion modeling has been completed to analyze LEA impacts on ambient air quantity and is discussed in the sections that follow.

Summary of ISC-PRIME Settings

This section describes the model options selected for modeling the proposed Laurentian Energy Authority, LLC (LEA) wood-fired electric generation facility to be located at the Hibbing Public Utility site. The analysis utilizes the Industrial Source Complex Short Term model with the PRIME downwash algorithm (ISC-PRIME), version 01228. The model is included within the BEEST dispersion modeling package assembled by Bowman Engineering of Asheville, North Carolina.

Terrain Option

Digitized terrain data for the project area was purchased from Micropath in the form of 30-meter DEM Quads. The Quads were stitched together and converted to NAD83 coordinates using the freeware program 3DEM. Class I area receptor grids are provided by the Federal Land Managers for Voyageur's National Park and the Boundary Waters Canoe Area.

Regulatory Default Option

The regulatory default option was used to employ the Plume Rise Model Enhancements (PRIME) algorithm for treatment of building downwash. The PRIME algorithm includes enhanced dispersion coefficients due to turbulent wake, and reduced plume rise caused by a combination of the descending stream lines in the lee of the building and the increased entrainment in the wake.

Concentration/Deposition Option

The concentration option was used to provide maximum pollutant concentrations that could be compared to Ambient Air Quality Standards. The model was set to provide output in terms of receptor concentration.

Rural/Urban Option

The Auer classification scheme was used to determine land use setting for the model. Rural dispersion coefficients were selected for the area, having greater than 50 percent of the land use within three (3) kilometers is either single-family residential, or agricultural.

Model Averaging Periods

Per USEPA guidance, dispersion modeling analysis is required for those pollutants with emission increases exceeding the major modification threshold.

For the proposed LEA wood-fired electric generation facility only the pollutants NO_x, PM_{10} and CO require dispersion modeling analysis. The following averaging periods were used for each pollutant:

NO_x	Annual
CO	1-Hour, 8-Hour
PM_{10}	24-Hour, Annual

Source Groups

For determination of significant impacts from the proposed facility a source group containing the proposed new LEA sources was employed (NEW_HPU). For PSD PM_{10} Increment consumption modeling, the proposed LEA sources at Virginia and Hibbing were modeled, plus increment consumers at Hibbing Taconite, Potlatch-Cook, and the Laskin Energy Center.

All sources have been relocated to NAD83 coordinates by comparing coordinate locations with digital orthophotos obtained from the Minnesota DNR Data Deli.

Emission Rates

Maximum potential emissions from the new LEA facility were used for both PSD Increment and NAAQS compliance model runs. For existing LEA sources, emissions were also modeled at potential emission rates for purposes of PSD Increment and NAAQS analysis. Sources outside of LEA were included at emission rates provided in the MPCA source inventories for PSD Increment and NAAQS.

Merging of Stacks

Merged stacks are not employed in the modeling of LEA sources. Boilers 1A and 2A stacks will be replaced with a common stack that was included in the analyses. A few distant sources may be modeled such that all facility emissions are assumed to pass through a single stack, but where possible, this practice has been avoided. Stack parameters are taken from previous modeling runs identified by MPCA as a source of data.

Building Downwash Implementation

The ISC models include algorithms to model the effects of buildings downwash on emissions from nearby or adjacent point sources. The U.S. EPA Building Profile Input Program (BPIP-PRIME) version 95086 was employed to determine building downwash parameters for the LEA sources. USEPA has recently approved the use of a new version of BPIP; however the update consists only of allocatable arrays that allow for unlimited numbers of buildings and stacks to be input. The BPIP model is included within the BEEST dispersion modeling package assembled by Bowman Engineering of Asheville, North Carolina, and has not yet implemented the minor update to BPIP.

Per guidance from MPCA, building downwash calculations should be undertaken for any sources located within 3 kilometers of the Virginia Public Utilities Site. However, none of the modeled sources lie within 3 kilometers, so building downwash is only implemented for the Virginia Public Utility – LEA site.

Meteorological Data

The meteorological data uses the most recent five years of available National Weather Service (NWS) meteorological data from the nearest site, the Hibbing surface and St. Cloud upper air observations. The information was obtained from the MPCA website and includes the years 1972-1976.

Receptor Grid Development

Significant impact modeling utilizes a large grid, extending out to 10,000 meters. Smaller grids that encompass the significant impact area of each pollutant are then used. The receptor grid employed for PM_{10} increment and NAAQS analysis is designed to exceed the PM_{10} worst-case significant impact radius, which extend to a maximum distance of 0.2 km (see Table 32). The grid utilizes 10 meter spacing on the fenceline, 25 meter spacing to 250 meters, 50 meter spacing to 500 meters, and 100 meter spacing to 1000 meters, and 200 meter spacing to 2000 meters. Receptors were located on the Hibbing Public Utilities property even if they fell on buildings.

Varying Load Analysis Procedures

For the varying load analysis, contributions from combustion sources are scaled appropriately in terms of emission rate and volume flow, resulting in less emission but also less exit velocity or plume rise. Temperature is assumed to remain constant through the varying load scenarios. Contributions from particulate generating sources are scaled for emission rate, but volume flow would be assumed to be constant in association with operation of the fan and control equipment, not scaled to production levels. 100, 75 and 50 percent load analyses are presented.

Other Hibbing Sources

Other Hibbing Public Utilities sources included in the NAAQS modeling are the two Hibbing High School boilers and the HPU cooling towers. The cooling towers were only included in the PM_{10} analysis.

Emergency Generators

A 1.5 MW emergency generator is proposed for the LEA site. The generator is provided solely for emergency use and will not be operated when other LEA and Hibbing Public Utility sources (boilers) are operating. The generator is therefore not included in modeling of ambient air concentrations for prediction of PSD Increment or NAAQS standard compliance.

Model Results

Modeling was performed in accordance with PSD guidance. A preliminary analysis was conducted to determine whether the proposed wood-fired electric generation facility created a significant impact on ambient air quality. This analysis was conducted for CO, NO_x and PM_{10}, pollutants for which the project represents a major increase in emissions subject to PSD. The preliminary analysis determines whether in-depth modeling of PSD increment consumption and NAAQS compliance must be conducted. When a source impact is less than the significant impact threshold, the source is said to be unable to cause or contribute to an exceedence of ambient air quality standards, and the analysis goes no further. When the source is shown to have a significant impact on ambient air quality, the full impact analysis must be conducted to assess whether PSD growth increments or NAAQS might be exceeded. The discussion below provides a summary of the dispersion modeling findings for the proposed LEA wood-fired electric generation facility.

Significant Impact Area Determination and Varying Load Analysis

Nitrogen Dioxide

- **Annual Averaging Period**

  Tables 23, 24, 25 summarize the model-predicted NO_x concentrations for the 100 percent, 75 percent and 50 percent load analyses annual averaging periods. We have applied the EPA Tier II analysis procedure, by multiplying NO_x concentrations by 75 percent to predict NO_2 concentations for comparison with significant impact thresholds. In all five years, regardless of load scenario, the impact from the new facility is not predicted to exceed the significant impact threshold of 1 microgram per cubic meter. Full impact modeling for NO_x is therefore not required for PSD Increment and NAAQS compliance based upon the annual averaging period.

Table 23

ISC-PRIME Results for 100% Load Nitrogen Dioxide Impacts Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y	Impact Radius (km)**
1972	0.77362	505250	5252750	-
1973	0.82051	505250	5252750	-
1974	0.99132	505250	5252750	-
1975	0.75197	505250	5252750	-
1976	0.94984	505250	5252750	-

***Radius measured from point 504979, 5252880*

Table 24
ISC-PRIME Results for 75% Load Nitrogen Dioxide Impacts
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y	Impact Radius (km)**
1972	0.76532	505250	5252750	-
1973	0.81857	505250	5252750	-
1974	0.97427	505250	5252750	-
1975	0.72608	505250	5252750	-
1976	0.94074	505250	5252750	-

***Radius measured from point 504979, 5252880*

Table 25
ISC-PRIME Results for 50% Load Nitrogen Dioxide Impacts
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y	Impact Radius (km)**
1972	0.70529	505250	5252750	-
1973	0.76335	505250	5252750	-
1974	0.88512	505250	5252750	-
1975	0.64857	505250	5252750	-
1976	0.85336	505250	5252750	-

***Radius measured from point 504979, 5252880*

Carbon Monoxide

- **1-Hour Averaging Period**
  Tables 26, 27, 28 summarize the model-predicted CO concentrations for the 1-hour averaging period for 100 percent, 75 percent and 50 percent load scenarios. In all scenarios and in all five years, the impact from the new facility is not predicted to exceed the significant impact threshold of 2,000 micrograms per cubic meter. Full impact modeling for CO is therefore not required for NAAQS compliance based upon the 1-hour averaging period.

Table 26
ISC-PRIME Results for 100% Load Carbon Monoxide Impacts
1-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	149.99123	09/15/07	505300	5252700	-
1973	127.26493	09/05/15	505250	2552750	-
1974	127.75669	07/28/06	505350	5252750	-
1975	150.61526	09/07/07	505250	5252700	-
1976	125.82668	05/08/14	505250	5252800	-

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Table 27
ISC-PRIME Results for 75% Load Carbon Monoxide Impact
1-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	126.93733	02/17/17	504850	5252500	-
1973	108.07137	07/02/11	505250	5252800	-
1974	110.07210	07/28/06	505300	5252750	-
1975	132.35284	09/07/07	505350	5252650	-
1976	149.34685	11/09/09	505225	5252725	-

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Table 28
ISC-PRIME Results for 50% Load Carbon Monoxide Impacts
1-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	92.27066	02/17/17	504850	5252500	-
1973	123.88910	09/06/06	505200	5252750	-
1974	86.69849	06/19/16	505350	5252750	-
1975	97.70144	09/07/07	505350	5252650	-
1976	116.41340	11/09/09	505350	5252650	-

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

- **8-Hour Averaging Period**
  Tables 29, 30, 31 summarize the model-predicted CO concentrations for the 8-hour averaging period for 100 percent, 75 percent and 50 percent load scenarios. In all load scenarios and in all five years, the impact from the new facility is not predicted to exceed the significant impact threshold of 500 micrograms per cubic meter. Full impact modeling for CO is therefore not required for NAAQS compliance based upon the 8-hour averaging period.

Table 29

ISC-PRIME Results for 100% Load Carbon Monoxide Impacts
8-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	89.93051	09/21/16	505200	5252750	-
1973	89.71220	09/22/08	505300	5252800	-
1974	94.23363	05/11/24	505300	5252750	-
1975	70.71896	10/25/08	505225	5252775	-
1976	95.26245	08/28/08	505225	5252750	-

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Table 30

ISC-PRIME Results for 75% Load Carbon Monoxide Impact
8-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	75.30640	09/21/16	505200	5252750	-
1973	81.01649	09/22/08	505300	5252800	-
1974	79.58185	05/11/24	505225	5252775	-
1975	63.38601	01/25/16	504900	5252600	-
1976	85.52904	08/28/08	505225	5252750	-

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Table 31

ISC-PRIME Results for 50% Load Carbon Monoxide Impacts
8-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	56.53041	03/30/24	505200	5252800	-
1973	62.77047	09/22/08	505250	5252800	-
1974	60.18925	05/11/24	505225	5252775	-
1975	50.74433	01/25/16	504900	5252600	-
1976	68.40408	08/28/08	505225	5252750	-

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Particulate Matter (PM_{10})

- **Annual Averaging Period**

Tables 32, 33, 34 summarize the model-predicted PM_{10} concentrations for the annual averaging period for 100 percent, 75 percent and 50 percent load scenarios. The 100 percent load scenario presents the highest concentrations in each of the five years. In all five years, regardless of load scenario, the impact from the new facility is predicted to exceed the significant impact threshold of 1 microgram per cubic meter. Full impact modeling must therefore be conducted for PM_{10} PSD Increment and NAAQS compliance for the annual averaging period.

Table 32

ISC-PRIME Results for 100% Load PM10 Impacts
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y	Impact Radius (km)
1972	5.65381	504975	5252925	0.2
1973	5.58509	504975	5252925	0.1
1974	5.52408	504975	5252925	0.2
1975	5.81625	504975	5252925	0.1
1976	5.87357	504975	5252900	0.2

Table 33

. ISC-PRIME Results for 75% Load PM10 Impacts
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y	Impact Radius (km)
1972	4.22563	504975	5252925	0.1
1973	4.17370	504975	5252925	0.1
1974	4.12951	504975	5252925	0.1
1975	4.34761	504975	5252925	0.1
1976	4.39658	504975	5252900	0.1

Table 34

. ISC-PRIME Results for 50% Load PM10 Impacts
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y	Impact Radius (km)
1972	2.82984	504975	5252925	0.1
1973	2.79603	504975	5252925	0.1
1974	2.76573	504975	5252925	0.1
1975	2.91131	504975	5252925	0.1
1976	2.94164	504975	5252900	0.1

- **24-Hour Averaging Period**

  Tables 35, 36, 37 summarize the model-predicted PM_{10} concentrations for the 24-hour averaging period for 100 percent, 75 percent and 50 percent load scenarios. The 100 percent load scenario presents the highest concentrations in each of the five years. Regardless of load scenario, the impact from the new facility is predicted to exceed the significant impact threshold of 5 micrograms per cubic meter. Full impact modeling must therefore be conducted for PM_{10} PSD Increment and NAAQS compliance for the 24-hour averaging period.

Table 35
ISC-PRIME Results for 100% Load PM10 Impacts
24-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	17.09664	09/11/24	504975	5252875	0.2
1973	18.35241	03/19/24	504900	5252975	0.2
1974	16.34417	08/04/24	504975	5252875	0.4
1975	16.07619	09/20/24	504975	5252850	0.2
1976	19.21914	07/07/24	504975	5252875	0.3

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Table 36
ISC-PRIME Results for 75% Load PM10 Impacts
24-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	12.78800	09/11/24	504975	5252875	0.1
1973	13.75634	03/19/24	504900	5252975	0.1
1974	12.23610	08/04/24	504975	5252875	0.1
1975	12.02373	09/20/24	504975	5252850	0.1
1976	14.37803	07/07/24	504975	5252875	0.2

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Table 37
ISC-PRIME Results for 50% Load PM10 Impacts
24-Hour Averaging Period

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y	Impact Radius (km)
1972	8.54894	09/11/24	504975	5252875	0.1
1973	9.17816	03/19/24	504900	5252975	0.1
1974	8.17358	08/04/24	504975	5252875	0.1
1975	8.03868	09/20/24	504975	5252850	0.1
1976	9.61149	07/07/24	504975	5252875	0.1

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

PSD Increment Consumption – All Increment-Consuming Sources

Particulate Matter (PM_{10})

- **Annual Averaging Period**

  Table 38 summarizes the model-predicted PM_{10} concentrations for the annual averaging period for all increment-consuming sources. In all five years, predicted increment consumption is less than the Class II PSD Increment standard of 17 micrograms per cubic meter.

Table 38
Summary of PM10 PSD Increment Consumption (All Sources)
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y
1972	5.85010	504975	5252925
1973	5.79943	504975	5252925
1974	5.73430	504975	5252925
1975	6.00317	504975	5252925
1976	6.06523	504975	5252900

- **24-Hour Averaging Period**

  Table 39 summarizes the model-predicted PM_{10} concentrations for the 24-hour averaging period for all increment-consuming sources. In all five years, predicted increment consumption is less than the Class II PSD Increment standard of 30 micrograms per cubic meter.

Table 39
Summary of PM10 PSD Increment Consumption (All Sources)
24-Hour Averaging Period – High Second High

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y
1972	16.68030	07/20/24	504975	5252875
1973	17.12489	07/26/24	505000	5252900
1974	15.84805	08/22/24	505000	5252900
1975	15.93654	04/03/24	504975	5252875
1976	18.07928	07/20/24	504975	5252875

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Particulate Matter (PM_{10})

- **Annual Averaging Period**

  Table 40 summarizes the model-predicted PM_{10} concentrations for the annual averaging period for NAAQS compliance by all identified point sources within 50 kilometers.

Table 40
Summary of PM10 NAAQS Compliance (All Sources)
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y
1976	29.99353	504975	5252900

- **Background Concentrations**

  Background concentrations were provided by MPCA. The MPCA-specified background concentration for annual PM10 is 16 micrograms per cubic meter. When added to the highest concentration from the NAAQS model, a value of 45.99353 micrograms per cubic meter is predicted, below the NAAQS standard of 50 micrograms per cubic meter.

- **24-Hour Averaging Period**

  Table 41 summarizes the model-predicted PM_{10} concentrations for the 24-hour averaging period for NAAQS compliance by all identified point sources within approximately 50 kilometers.

Table 41

Summary of PM10 NAAQS Compliance (All Sources)
24-Hour Averaging Period – High Sixth High/5 Years

Year	Highest-High Concentration (ug/m3)	Period*	Receptor X	Receptor Y
1975	93.82701	03/06/24	504975	5252875

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

- **Background Concentrations**

  Background concentration was provided by MPCA. The MPCA-specified background concentration for 24-hour PM10 is 37 micrograms per cubic meter. When added to the highest concentration from the NAAQS model, a value of 130.82701 micrograms per cubic meter is predicted, below the NAAQS standard of 150 micrograms per cubic meter.

Additional Impact Analyses

Source: Permit Application

Additional Impact Analysis

The additional impact analysis refers to completion of an environmental review which is not the same as the ambient air quality analysis discussed in Section 3.3. The environmental impact refers to review of such items as the solid or hazardous waste generation, discharges of water from a control device, visibility impacts, or emission of unregulated pollutants.

In Minnesota, new sources of emissions that have the potential to emit more than 100 tons per year of a criteria pollutant are required to complete an Environmental Assessment Worksheet (EAW). The elements of the EAW address the issues identified as part of PSD review. Please refer to the EAW submitted for this project for additional information on the environmental impact from this facility. The environmental impact issues as specified by PSD are discussed in the sections that follow.

Growth Analysis

No growth is expected from the LEA project, just maintenance of current employment status of the area. LEA will contract with HPU to operate and maintain the wood fired boiler. LEA will not employ any additional staff beyond what is already required to operate the existing HPU facility.

Without LEA, HPU is faced with the inevitability that its existing operation is becoming no longer cost effective and at some point the district heating system would be closed. Closure will result in loss of employment for the personnel currently operating the HPU plant.

In addition, instead of a centralized facility providing steam for hot water and building heat (commercial, institutional, and residential), existing customers would be force to install alternative means for comfort heating and hot water. The impact of the numerous individual heating units required to displace the existing heating source, would be a considerable environmental impact to the area and the ability to use the thermal load to generate electricity thereby increasing efficiency would be lost.

If any job growth would result in the formation of LEA, it may be in the area of forestry and logging, however, it is more likely that workers displaced from losses in this industry would be reactivated to serve LEA. In all, no growth of employment is expected, just maintenance of current levels. Maintenance of current employment levels in Minnesota's more rural areas makes good state-wide sense for protecting the environment. Displaced rural workers tend to move to more metropolitan areas such as the Twin Cities where it is perceived employment opportunities and social programs are more readily available. Additional population in the metropolitan area will result in additional environmental impact in areas that are already under environmental stress. Because no growth is expected to result from this project, no growth analysis has been completed.

Soils and Vegetation Analysis

LEA project impacts are largely covered in the EAW submitted under separate cover. Per MPCA direction, no detailed analysis of soils and vegetation impacts has been undertaken. However, dispersion modeling has shown that the ambient air impacts of emissions from the LEA facility are below both the primary and secondary NAAQS. Therefore, no significant adverse impact is predicted for soils and vegetation as a result of the LEA project.

Visibility Impairment Analysis

No visibility analysis is required based on direction received from Minnesota Pollution Control Agency and Federal Land Managers.

Conclusion

The environmental impact posed by this project is considered to be a net benefit for the following reasons:

- Retention of existing population due to maintenance of employment opportunities.
- Offsetting of coal combustion currently used for electrical generation.
- Maintenance of district heating system will prevent individual smaller, unregulated and uncontrolled heating units from being installed in the area.
- Reduction of GHG emissions.
- Replacing fossil fuel with renewable fuel to meet areas energy demands

Class I Area Impact Analysis

Impacts on Class I Areas

The Boundary Waters Canoe Area (BWCA) and Voyageur's National Park (VNP) Class I areas are located approximately 55 kilometers from the proposed LEA source at Hibbing, Minnesota. Nitrogen dioxide and PM_{10} impacts were modeled using ISC-PRIME. A receptor grid for each class I area was obtained from the federal land managers. The grid coordinates were converted to NAD83 UTM using the CORPSCON program. As directed by the Federal Land Manager, model results were compared to Class I area significant impact thresholds found in the 1996 EPA proposed revisions to the New Source Review program.

Nitrogen Dioxide

- **Annual Averaging Period**

  Table 42 summarizes the model-predicted NO_x concentrations for the BWCA Class I Area for the annual averaging period. The highest predicted concentration is 0.00502 micrograms per cubic meter. The modeled value is well below the proposed Class I significant impact threshold of 0.1 ug/m^3.

Table 42
ISC-PRIME Predicted Impacts in BWCA Class I Area - Nitrogen Dioxide
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y
1972	0.00502	546963.19	5311387.5
1973	0.00374	548853.19	5308624.5
1974	0.00468	546985.69	5308609.0
1975	0.00439	543000.06	5341923.0
1976	0.00414	546918.12	5316944.5

Table 43 summarizes the model-predicted NO_x concentrations for the VNP Class I Area for the annual averaging period. The highest predicted concentration is 0.00521 micrograms per cubic meter. The modeled value is well below the proposed Class I significant impact threshold of 0.1 ug/m3.

Table 43
ISC-PRIME Predicted Impacts in VNP Class I Area - Nitrogen Dioxide
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y
1972	0.00491	507695.59	5363071.0
1973	0.00471	507695.59	5363071.0
1974	0.00421	503988.91	5374183.0
1975	0.00521	516332.56	5361236.5
1976	0.00385	522507.44	5359405.0

Particulate Matter (PM_{10})

- **Annual Averaging Period**

  Table 44 summarizes the model-predicted PM_{10} concentrations for the BWCA Class I Area for the annual averaging period. The highest predicted concentration is 0.00107 micrograms per cubic meter. The modeled value is well below the proposed Class I significant impact threshold of 0.2 ug/m^3.

Table 44
ISC-PRIME Predicted Impacts in BWCA Class I Area – PM10
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y
1972	0.00107	548853.19	5308624.5
1973	0.00082	550720.75	5308640.5
1974	0.00106	546985.69	5308609.0
1975	0.00093	543000.06	5341923.0
1976	0.00087	546918.12	5316944.5

Table 45 summarizes the model-predicted PM_{10} concentrations for the VNP Class I Area for the annual averaging period. The highest predicted concentration is 0.00112 micrograms per cubic meter. The modeled value is well below the proposed Class I significant impact threshold of 0.2 ug/m^3.

Table 45
ISC-PRIME Predicted Impacts in VNP Class I Area – PM10
Annual Averaging Period

Year	High Concentration (ug/m3)	Receptor X	Receptor Y
1972	0.00105	507695.59	5363071.0
1973	0.00096	507695.59	5363071.0
1974	0.00091	503988.91	5374183.0
1975	0.00112	516332.56	5361236.5
1976	0.00084	522507.44	5359405.0

- **24-Hour Averaging Period**

Table 46 summarizes the model-predicted PM_{10} concentrations for the BWCA Class I Area for the 24-hour averaging period. The highest predicted concentration is 0.03553 micrograms per cubic meter. The modeled value is well below the proposed Class I significant impact threshold of 0.3 ug/m^3.

Table 46
ISC-PRIME Predicted Impacts in BWCA Class I Area – PM10
24-Hour Averaging Period

Year	*Highest-High Concentration (ug/m3)*	*Period**	*Receptor X*	*Receptor Y*
1972	0.02705	08/16/24	596963.19	5311387.5
1973	0.02565	10/04/24	610744.94	5295583.0
1974	0.03553	01/02/24	561955.38	5305971.5
1975	0.02756	02/19/24	546985.69	5308609.0
1976	0.02285	05/13/24	546963.19	5311387.5

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

Table 47 summarizes the model-predicted PM_{10} concentrations for the VNP Class I Area for the 24-hour averaging period. The highest predicted concentration is 0.02139 micrograms per cubic meter. The modeled value is well below the proposed Class I significant impact threshold of 0.3 ug/m3.

Table 47
ISC-PRIME Predicted Impacts in VNP Class I Area – PM10
24-Hour Averaging Period

Year	*Highest-High Concentration (ug/m3)*	*Period**	*Receptor X*	*Receptor Y*
1972	0.02011	07/17/24	526209.19	5359421.0
1973	0.02139	01/12/24	515074.72	5370496.0
1974	0.01887	02/06/24	527443.19	5359426.5
1975	0.01833	02/20/24	538598.75	5352081.0
1976	0.01586	01/17/24	522449.06	5374225.5

**period notation refers to the time period during which the high value occurred (day/mo/hr)*

AERA Results

1a) AQ Facility ID No.: 13700027
1b) AQ File No.: 659
2) Facility Name: Laurentian Energy Authority, LLC; Hibbing Public Utilities
3) Date of Submittal:
4) Date Form Completed: April 1, 2005
4a) Project Team Members: Jenny Reinertsen, Dennis Becker, Vanessa Ranck, Chuck Stroebel (MDH)
5) Date of Risk Management Recommendation

6. General Information

- Hibbing Public Utility (HPU) is a district heating facility which also utilizes the steam to generate electricity.
- The facility was constructed in 1919 and is in downtown Hibbing.
- HPU operates three coal fired boilers, two of which can also fire natural gas.
- Existing steam driven turbines allow HPU to generate up to 34 MW of electricity.
- Two natural gas-fired boilers at Hibbing High School are connected to HPU steam distribution system.
- Power purchase agreement (PPA) between Laurentian Energy Authority (LEA) and Xcel requires production of 35 MW. Since Hibbing cannot produce 35 MW independently, they teamed with Virginia Department of Public Utilities (VDPU) to form LEA.
- The PPA will require Hibbing to dedicate approximately 20 MW of electricity from the proposed wood-fired boiler with supplemental steam from the existing coal-fired boilers to meet the PPA with Xcel.
- Since the wood-fired boiler will not be at capacity until the closed loop biomass is 100 percent available (5 years) the supplemental steam is required to meet the PPA.
- There will be a 12.4% reduction in coal use for both facilities over the life of the PPA.
- The project will result in a reduction of 15.7 pounds of mercury emissions from both facilities combined (based on projected actuals) over the 20 years of this analysis.
- The proposed wood-fired boiler will burn open loop biomass generated from the forest industry residue, before the closed loop wood is available.
- Closed loop biomass will be harvested within a 100 mile radius of plant.
- Emissions from the proposed boiler are based on permitted potential-to-emit (PTE).

The second table below was extracted by MPCA from data submitted by the facility in the RASS. Emissions assessed for include:

- proposed wood boiler
- wood unloading
- wood conveying
- wood storage bin
- wood transfer/metering bin
- wood ash silo

7. Total Facility at maximum capacity: One wood boiler and three existing coal boilers

Air Toxics Screen											
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks				Total Multipathway Screening Hazard Indices and Cancer Risks			
Acute [1]	Subchronic Noncancer [1]	Chronic Noncancer [1]	Cancer [2]	Farmer Noncancer [1]	Farmer Cancer [2]	Resident Noncancer [1]	Resident Cancer [2]	Farmer Noncancer [1]	Farmer Cancer [2]	Resident Noncancer [1]	Resident Cancer [2]
2.6E+00	2.7E-01	1.6E+00	6.6E-05	2.9E-03	1.0E-03		3.6E-06	1.6E+00	1.1E-03	1.6E+00	6.9E-05
REFINE	OK	REFINE	REFINE	OK	REFINE		OK	REFINE	REFINE	REFINE	REFINE

[1] Threshold or acceptable level for acute, subchronic and chronic noncancer hazard indices is 1.0
[2] Threshold or acceptable level for cancer risk is 1.0E-05.

Wood ONLY (new project)

Air Toxics Screen											
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks				Total Multipathway Screening Hazard Indices and Cancer Risks			
Acute [1]	Subchronic Noncancer [1]	Chronic Noncancer [1]	Cancer [2]	Farmer Noncancer [1]	Farmer Cancer [2]	Resident Noncancer [1]	Resident Cancer [2]	Farmer Noncancer [1]	Farmer Cancer [2]	Resident Noncancer [1]	Resident Cancer [2]
1.3E-01	7.4E-03	1.5E-01	3.2E-06	1.1E-04	4.9E-04		1.5E-06	1.5E-01	5.0E-04	1.5E-01	4.6E-06
OK	OK	OK	OK	OK	REFINE		OK	OK	REFINE	OK	OK

[1] Threshold or acceptable level for acute, subchronic and chronic noncancer hazard indices is 1.0
[2] Threshold or acceptable level for cancer risk is 1.0E-05.

8. Summary of Components:
Risk Assessment (Total Facility):

- As part of addressing a sulfur dioxide issue, a new stack is proposed to be constructed at the facility in place of an existing stack. This stack will be 42 feet higher than the present stack, reducing risks estimated in this assessment.
- Acute hazard index is 3, the primary risk driver is NO_x.
- The AERA assumes 100% of NO_x is NO_2, this is a conservative assumption.
- Chronic noncancer hazard index is 2
- Cancer risk is 7E-05
- Sixty-six percent of the cancer risk is from chromium compounds, which is based on a chromium VI surrogate toxicity value.
- Thirty-two percent of the cancer risk is from arsenic compounds, which is based on an arsenic surrogate toxicity value.
- Total farmer noncancer hazard index is 2
- Total farmer cancer risk is 1E-03
- An ESRI land use map and information provided by the facility show that there is a low incidence of farming in the area.
- Total resident noncancer hazard index is 2, driven by the inhalation pathway.
- Total resident cancer risk is 7E-05, driven by the inhalation pathway.
- High annual values are predicted to occur in residential neighborhoods southeast of the facility, near Hibbing High School.
- High one-hour concentrations are predicted to occur on railroad tracks west of the facility. Houses are close to the railroad. (see attached map)
- There is no fence surrounding the facility.
- Persistent, bioaccumulative and toxic chemicals are emitted

For acute risks, the majority of risks come from nitrogen oxides (NO_x), which targets the respiratory system. The AERA process assumes that 100% of the NO_x coming from the stack is NO_2. This is a conservative assumption. Based on EPA guidance, a facility may assume that 75% of NOx emissions are NO_2. This assumption is not appropriate when comparing emissions to acute benchmarks. Diesel combustion has shown NO_2 levels to be around 10%. MPCA believes that the acute NO_2 is between 75% and 10%, likely closer to 10%.

The LEA estimates that there will be a 12.4 percent reduction in coal consumption for both facilities (HPU and VDPU) over the life of the PPA. There will not be a reduction in coal consumption at the outset of the project since additional steam will be needed to satisfy the PPA prior to the wood-fired boiler being on-line and at full capacity with open loop and closed loop biomass. In other words, the PPA stipulates that LEA will be required to meet the MW in the agreement immediately. The estimate of the coal consumption reduction (12.4%) comes from coal use projections made by LEA and the owner's engineer, the Harris Group.

Dispersion Modeling: <u>Acceptable</u>
Dispersion factors reflect the MPCA DISPERSE batch program (acceptable model, receptors, meteorology, and land use land cover data), or more conservative MPCA RASS/DISPERSE look-up table. Larger sources (e.g., coal and wood-fired boilers) used the DISPERSE batch program. Smaller particulate-only sources used the DISPERSE look-up table. Some small particulate emission sources were not included in the RASS (e.g., traffic).

As part of federal PSD requirements (40 CFR 52.21), full particulate matter less than 10 microns (PM_{10}) and nitrogen oxide (NO_x) modeling is being conducted; it will consider all facility sources including other nearby sources and background concentrations.

Emission Calculations:
The database used came from EPA's Background Information for Section 1.6 of AP42, Wood Residue Combustion. Test data for all pollutants were averaged for all sources that had high efficiency particulate control, as it was assumed that those factors would be most accurately predictive of potential emissions from the new wood-fired boiler. Some of the facilities tested had no control, cyclone control, or wet scrubbers. Data from those facilities were not used in developing average emission factors. In addition to not being similarly controlled, those boilers are most likely older than the better controlled boilers, and hence may be less efficient in relation to combustion.

AP42 factors from Section 1.1, Coal Combustion, were used to calculate emissions from the existing coal boilers. AP42 factors from Section 1.4, Natural Gas Combustion were used to calculate emissions from the natural gas fired boilers at the high school.

For the material handling baghouses, the emission limits were used to calculate potential particulate and PM_{10} emissions.

For fugitive emissions from material handling, EPA's AP42 Section 13.2.4, Aggregate Handling and Storage Piles equations were used. Again, the amount of material handled was derived by assuming full capacity operation of all boilers.

Potential emissions are calculated by using emission limits combined with full capacity operation for those pollutants with emission limits, and emission factors combined with full capacity operation for those pollutants without emission limits

Hourly emission rates were calculated assuming full capacity operation. Annual emissions are obtained by assuming continuous operation (8760 hours per year). Annual emissions are typically reported in tons per year. To convert pounds per hour into tons per year the emission rate must be multiplied by 8760 and then divided by 2000 (amount of pounds in a ton). This method for calculating potential emissions is conservation, since most emission units are designed to operate at a higher capacity then what will be utilized.

MDH:
Minnesota Department of Health (MDH) participated in the review of the LEA Hibbing Public Utilities AERA. MDH's comments have been incorporated throughout this report.

<u>EMISSIONS:</u>

9. Were PTE or future projected actuals used for any or all of the emissions or scenarios?
Permitted PTE: Permitted PTE is the maximum capacity of the facility to emit, taking into account emission limits and any physical limits on operation.

10. Percent mass assessed in each RASS analysis.

Analysis Description	% VOC	% HAPs
PTE	21.7%	100%

11. Total mass assessed for each emissions dataset (tons/year).

Analysis Description	Total VOC	Total HAPs	Total Criteria Pollutants
PTE	25.6	257.3	9194.8

Previous AERAs have assessed 2 to 22 percent of VOCs, primarily for ethanol facilities. The AERAs completed to date have assessed 76 to 100 percent of the HAPs.

CHEMICALS

12. Are there any potentially missing chemicals or sources from the RASS? Yes

Several emission sources were not quantitatively evaluated, those include:

- Emission releases related to shutdowns or breakdowns
- Emergency internal combustion engine
- Insignificant activities, including those with less than 1% of the total facility potential:
  - Fugitive dust from truck traffic
  - Ash silo vents
  - Fugitive dust from ash load-out
  - Coal handling activities from the existing operation

The facility is permitted to burn 500 pounds per year of oily rags and 5000 gallons per year of used oil. Emissions from these sources were not quantified in the RASS.

AERA guidance excludes activities listed above from AERA review. For additional information, see Section 2.3.2 on page 15 of the AERA Guide.

Based on the emission factor sources used in the assessment, there are no missing chemicals in the COPI list.

13. If thresholds have been exceeded, list the chemicals that contribute to the elevated hazard indices and the percent to which they contribute.

Acute	hazard quotient	percent contribution
Arsenic Compounds	0.3	11.8%
Nitrogen oxide (NO2)	2.1	88.2%

Chronic Noncancer	hazard quotient	percent contribution
Acrolein	0.2	11.9%
Arsenic Compounds	0.2	11.2%
Chromium Compounds	0.3	23.9%
Hydrochloric Acid	0.6	44.8%
Hydrogen Fluoride	0.1	8.2%

Cancer	cancer risk	percent contribution
Arsenic Compounds	1.9E-05	32.2%
Chromium (Hexavalent particulate)	9.6E-06	15.8%
Chromium Compounds	3.1E-05	50.9%
Nickel Compounds	1.3E-06	2.1%

Total Farmer Noncancer	hazard quotient	percent contribution
Acrolein	0.2	11.9%
Arsenic Compounds	0.2	11.2%
Chromium Compounds	0.3	23.9%
Hydrochloric Acid	0.6	44.8%
Hydrogen Fluoride	0.1	8.2%

Total Farmer Cancer	cancer risk	percent contribution
Arsenic Compounds	1.9E-05	1.7%
Beryllium Compounds	2.2E-06	0.2%
Cadmium Compounds	1.0E-05	0.9%
Chromium (Hexavalent) (particulate)	9.6E-06	0.9%
Chromium Compounds	3.1E-05	2.8%
Hexachlorodibenzodioxins, All Congeners	3.9E-06	0.4%
Hexachlorodibenzofurans, All Congeners	4.1E-06	0.4%
Indeno(1,2,3-cd)pyrene	6.2E-06	0.6%
Nickel Compounds	1.3E-06	0.1%
Pentachlorodibenzodioxins, All Congeners	1.9E-04	17.3%
Pentachlorodibenzofurans, All Congeners	3.0E-04	27.3%
Tetrachlorodibenzodioxins, All Congeners	4.9E-04	44.6%
Tetrachlorodibenzodioxin, 2,3,7,8-	1.9E-05	1.7%
Tetrachlorodibenzofurans, All Congeners	2.1E-05	1.9%
Tetrachlorodibenzofuran, 2,3,7,8-	1.8E-06	0.2%

Total Resident Noncancer	hazard quotient	percent contribution
Acrolein	0.2	11.9%
Arsenic Compounds	0.2	11.2%
Chromium Compounds	0.3	23.9%
Hydrochloric Acid	0.6	44.8%
Hydrogen Fluoride	0.1	8.2%

Total Resident Cancer	cancer risk	percent contribution
Arsenic Compounds	1.9E-05	29.1%
Chromium (Hexavalent) (particulate)	9.6E-06	14.7%
Chromium Compounds	3.1E-05	47.4%
Nickel Compounds	1.3E-06	2.0%
Pentachlorodibenzodioxins, All Congeners	1.5E-06	2.3%
Tetrachlorodibenzodioxins, All Congeners	3.0E-06	4.6%

14. List chemicals emitted but lacking inhalation health benchmarks

Acetophenone	Cobalt	Dinitrophenol, 2,4-
Nitrophenol, 4-	Acenaphthene	Acenaphthylene
Acetone	Anthracene	Benzaldehyde
Benzo(e)pyrene	Benzo(g,h,I) perylene	Benzoic Acid
Bromomethane	Carbazole	Chloromethane
2-Chloronaphthalene	2-Chlorophenol	Crotonaldehyde
Decachlorobyphenyl	1,2-Dichloroethene	Dichlorobiphenyl
1,2-Dichloroethane	Fluoranthene	Fluorene
Heptachlorobiphenyl	Hexachlorobiphenyl	Hexanal
Isobutyraldehyde	Methane	2-Methylnaphthalene
Monochlorobiphenyl	2-Nitrophenol	Pentachlorobiphenyl
Perylene	Phenanthrene	Propanal
Propionaldehyde	Pyrene	Tetrachlorobiphenyl
Tetrachloroethene	o-Tolualdehyde	p-Tolualdehyde
Trichlorobiphenyl	Trichloroethene	Iron
Molybdenum	Phosphorus	Potassium
Silver	Sodium	Strontium
Tin	Titanium	Vanadium
Yttrium	3-Methylchloranthrene	Biphenyl
Pentane	5-Methyl Chrysene	Dimethyl sulfate-
Methyl hydrazine	Butane	Ethane
Propane		

15. Are respiratory sensitizers emitted? Yes **Are there respiratory sensitizers emitted that lack IHBs?** No

Formaldehyde, beryllium and nickel compounds are emitted. The facility did not report any respiratory sensitizers that lack inhalation health benchmarks. The chemicals do not exceed inhalation health benchmarks.

16. Are developmental toxicants emitted? Yes **Are any above the 1 hour inhalation health benchmark ceiling values?** No

Arsenic compounds, benzene, carbon disulfide, carbon tetrachloride, chloroform, ethyl benzene, ethyl chloride, and mercury compounds are emitted from the Hibbing facility. No one hour inhalation health benchmark ceiling values have been exceeded.

17. Mercury Analysis:

This mercury analysis is for the LEA project as a whole and incorporates information from both the Hibbing and Virginia facilities. The mercury analysis, unlike the rest of the document, assesses mercury emissions based on future actuals, not permitted PTE.

This project consists of the construction of two new wood-fired boilers. Each boiler will be located at existing public utilities where coal-fired boilers will continue to operate.

Mercury emission limits apply to both the new wood-fired and the existing coal-fired boilers. The Industrial Boiler NESHAP, adopted by EPA in September 2004 imposes a mercury emission limit immediately upon startup of any new boiler, including the proposed wood boilers at Virginia and Hibbing, and requires the existing coal-fired boilers be in compliance with the limit in 2007.

Stack testing of the existing boilers has been completed and shows compliance with the boilers' applicable mercury emission limit in the industrial boiler NESHAP. The data used to develop emission estimates of actual and "future actual" conditions for the existing boilers relies on this stack test data, and can be considered an accurate estimate of actual emissions. One method of removing mercury from coal-fired boilers is to ensure that the flue gases have some carbon in the particulate matter for the mercury to adsorb to. The carbon is then removed in particulate controls downstream of the boilers. "Loss on ignition" (LOI) measurements on bottom and fly ash measure the amount of unburned carbon remaining in the ash. It is hypothesized that this unburned carbon acts as an inherent control of mercury. Hibbing Public Utility staff reports that their recent test of fly ash shows its LOI to be about 24.5% by weight, representing a fly ash that is nearly one-quarter carbon, which could be providing some mercury control. Improved particulate matter capture could significantly lower mercury emissions from the existing coal boilers simply by removing more particulate to which mercury is already adsorbed. Virginia boilers are expected to be performing similarly.

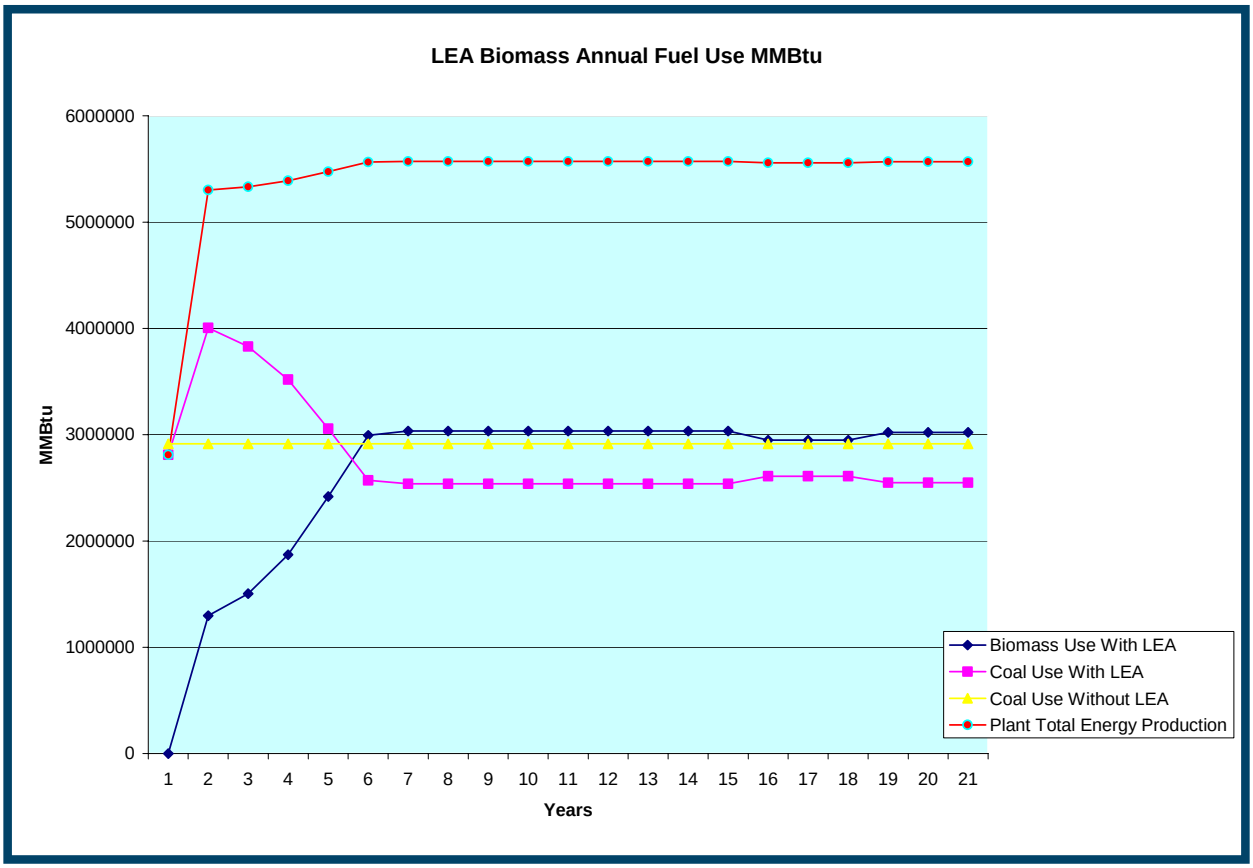
Wood-fired boiler PTE have also been calculated using the limit imposed by the industrial boiler rule.

This project in the long-term will reduce the amount of coal used at the two municipal utilities, however, between years 1 and 5 after the wood-fired boilers begin operating, coal use will go up in order to meet LEA's purchase power agreement with Minnesota Power. Coal use will initially increase from an annual rate of approximately 2,810,988 to 4,004,320 MMBtu. During operating years 1 through 5, the availability and use of biomass fuel will increase, decreasing the amount of coal used to meet LEA's generating requirements. Coal use will decrease to about 2,500,000 MMBtu/year at year 6 and remain at about that level for the life of the project.

Figure 1 below shows the use of coal both with and without the LEA project. Because biomass fuel is displacing coal, over the life of the project, less mercury is emitted than if the existing coal fired boilers continued operating as they are today. The project will result in 15.7 lbs of mercury avoided over the 20 years of this analysis.

Mercury species from boilers is mostly elemental, meaning that mercury released from the coal and wood boiler stacks will likely join the regional and global pool rather than deposit locally. This project results in total net reduction in mercury emissions at the fuel use levels evaluated in this project, demonstrating an important characteristic in the application of biomass fuels for electricity generation.

Figure 1. Fuel Use at Laurentian Energy, years 1 to 20.



18. Should separating toxicity endpoints be considered for a refined risk assessment after the AERA process? No

The acute risk for HPU is 3, based primarily on NO_x, which exceeds thresholds by itself.

Chronic hazard quotients (HIs = 1.6) for inhalation and multimedia are spread throughout the chemicals, with none of the chemicals individually exceeding thresholds. Chemicals that target portions of the respiratory system (Cr compounds, HCl, HF) equal one. Acrolein and arsenic do not share target organs, thus separating endpoints would not lower the risk below thresholds.

Inhalation cancer risks are 7×10^{-5}. All cancer endpoints are the same, thus separating endpoints is not possible.

19. What are the direct $PM_{2.5}$ emissions, if applicable?

According to USEPA, combustion is one of the largest point sources of fine particulate emissions. Using the 2002 Emission Inventory data, the actual direct $PM_{2.5}$ emissions from the Hibbing facility are at 19,340.18 pounds (9.7 tons) per year. The current actual emissions are based on the combustion sources that currently operate at the Hibbing facility and do not include the proposed project.

The additional boiler will increase the $PM_{2.5}$ emissions from the facility. In addition, the increased truck traffic to the facility will also add to particulate matter impacts. EPA's PM Calculator is used to estimate the amount of direct $PM_{2.5}$ emissions that are coming from a source. For some sources, the amount of direct $PM_{2.5}$ emitted is a ratio of the PM_{10} emitted.

Primary or direct $PM_{2.5}$ emissions, which are noted here, are expected to behave like other air toxics gases that are commonly modeled and assessed. Primary $PM_{2.5}$ is of more concern for local deposition than secondary $PM_{2.5}$. Secondary $PM_{2.5}$ forms at a significant distance from the facility. The $PM_{2.5}$ precursor gases, which for some types of facilities may ultimately contribute to more $PM_{2.5}$ in the ambient air, are a greater concern regionally.

20. Are the criteria pollutants compared to the AAQS using "high first high" modeled concentrations?

Yes, the highest annual concentrations are used in the RASS for comparison to the AAQS. For regulatory purposes, the annual AAQS are compared with the maximum annual concentrations (a.k.a. High-1st-High [H1H] values), and the short-term (24 hours or less) AAQS are compared with special non-maximum concentrations (e.g., H2H values for short-term SO2 AAQS; H6H 24-hour PM_{10} values when using 5 years of meteorological data). Although PM and SO_2 AAQS are exceeded below, regulatory methods were not used.

21. What are the ratios of criteria pollutants to their AAQS?

Criteria Pollutant Screen					
Chemical	**Fraction of 1-hr std**	**Fraction of 3-hr std**	**Fraction of 24-hr std**	**Fraction of qtrly std**	**Fraction of annual std**
SO_2	**2.959**	**3.813**	**7.183**		**5.806**
PM_{10}			**3.056**		**1.688**
$PM_{2.5}$					
NO_x					**0.889**
CO	**0.018**				
Pb				**0.005**	

All ambient standards are exceeded for sulfur dioxide and PM_{10}. PM monitoring shows particulate matter below ambient standards. The addition of the wood boiler to this facility will increase the amount of criteria pollutants in the ambient air.

Site specific dispersion modeling using U.S. EPA's models for PM_{10}, NOx, and CO were used as part of the regulatory review under federal new source review. Those site specific (more accurate) models show no violation of the ambient standards.

Modeling was not required for sulfur dioxide under the new source review program. However, as part of the permitting review, previous dispersion modeling required by the Title V permit previously issued to the facility did show compliance with ambient sulfur dioxide standards, but MPCA policy for emissions estimation was not followed. Accordingly, the MPCA required new dispersion modeling to be submitted. That modeling showed that the emission limit needed to be reduced for the three existing coal fired boilers, and the stack extended. Those requirements will be made permit conditions, and must be completed prior to startup of the new wood fired boiler.

Criteria pollutants have health effects that will impact health effects from toxics emitted at the facility. Total additive effects of these chemicals are not known.

22. a. Were surrogate inhalation health benchmarks used for risk drivers? Yes **Which ones?**
* designates those surrogates that are risk drivers exceeding thresholds by themselves.
Arsenic Compounds*
Beryllium Compounds
Chromium Compounds*
Hexachlorodibenzodioxins, All Congeners
Hexachlorodibenzofurans, All Congeners
Nickel Compounds
Pentachlorodibenzodioxins, All Congeners*
Pentachlorodibenzofurans, All Congeners*
Tetrachlorodibenzodioxins, All Congeners*
Tetrachlorodibenzofurans, All Congeners*

The chromium compounds toxicity value is a surrogate value based on chromic acid mists and dissolved chromium VI aerosols. It is likely that this would over predict the risk from the mixture named chromium compounds. Arsenic compounds are based on the surrogate toxicity value for arsenic.

For the dioxin and furan surrogates, there is an over prediction of risk. The surrogate toxicity values for dioxins and furans are based on the most potent carcinogen congener of the particular class, e.g. penta, hexa, tetra.

b. Are surrogate toxicity values used for other chemicals that could impact the assessment (e.g. PAHs)? No

MAPS

23. Are there sensitive receptors (use Facility Analysis Worksheet map)? Yes
The surrounding area is comprised of businesses and residences which include sensitive receptors. The facility provided a map as well as a listing of those sensitive receptors found within one kilometer radius around the facility.

There are several homes across the street from the facility. The homes are on the side of the facility where coal unloading occurs.

There are four schools and one daycare within one kilometer of the facility. High annual predicted risks are at the site of the Hibbing Memorial High School and near Assumption School.

There is one nursing home within one kilometer of the facility.

Five parks and athletic fields are within one kilometer of the facility.

No hospitals have been noted in the area.

24. Is there evidence the land in the area of impact will not be used for agriculture (farming, livestock, etc.)? No
An ESRI land use map and information provided by the facility show that there is a low incidence of farming in the area. There is one cattle and dairy farm at the three kilometer radius (see attached map). Risk thresholds are exceeded for the farmer cancer scenario in the multipathway assessment.

25. **How far away is the nearest fishable water body? Could there be an impact based on chemicals emitted and distance?** Yes

There are several small creeks and tributaries in the three kilometer radius surround the Hibbing facility. Bryan Lake is also to the south east of the facility. We have not assessed impacts to fishable waters from the Hibbing facility.

MPCA staff are currently reviewing chemical fate and transport models for the purpose of estimating screening concentrations in water bodies and in fish that could result from facility air emissions. Due to the dynamic nature of a large number of variables that come into play in predicting uptake to fish (e.g. watershed to waterbody size ratio, turnover rate of waterbody, permeability of watershed soils, and many other parameters), the fate and transport models under consideration have not yet been determined by MPCA staff to provide conservative estimates of fish uptake while not providing unrealistically high estimates. The fish consumption pathway therefore was not evaluated quantitatively.

26. **What other permitted facilities are located within a one mile radius of the facility?**

There are several facilities within a one mile (1.6 km) radius from the facility. According to an internal database, facilities with air permits include Hilligoss Chevrolet Inc. dba Ranger Chevr. and American Linen Supply Co. The MPCA's Environmental Air Data Access webpage identifies Northern Castings Corp. as being within one mile of the Hibbing facility.

27. **Census Blocks. 2000 census populations residing in census blocks within the facility impact area. Include demographical information.**

The population of Hibbing is 18,129 according to the 2000 census. Hibbing has approximately 12 percent of its population below the poverty line. Sensitive populations, such as those under 5 years of age and those over 65 years are scattered and range from 2 persons to 100 persons in a census block. There are approximately 41 people per square mile in the city of Hibbing. Additional information on census blocks in Hibbing can be seen in the attached maps.

ADDITIONAL INFORMATION

28. **Accidental Release information (Incident Management System data on facility reports of SSM events from the last 5 years). Additional information as relevant.**

Data from the Incident Management System have shown complaints on the dust fallout from the facility in fall of 2000. Additional equipment for EU003 was shut down in January 2005 to work on CE003 and CE001. Three out of four precipitator cells on one unit were down in February 2005.

29. **Internal Combustion Engines. (AERA-04 Certification for Emergency Internal Combustion Engines)**

The Hibbing facility is proposing to install an emergency generator using #2 diesel fuel as part of the LEA Biomass Energy Project. The stack height will be 12.2 meters and is to be located to the side of one of the facility's buildings (see attached map). The building has a height of almost 33 meters. The testing frequency for the emergency generator is 1 hour per week. The maximum hours permitted for this generator are 500 hours.

See AERA-04 Form for additional information

30. What monitoring station(s) would provide representative ambient air toxic or criteria pollutant concentrations in the vicinity of the facility? Summarize monitoring results.

Air toxics, including VOCs, carbonyls and metals, were monitored in Hibbing from October 1997 through September 1998. The monitor was located on Hibbing Middle School at 23rd Street and 12 Avenue. Metals and particulate matter (total suspended particulate, PM_{10} and $PM_{2.5}$) continue to be monitored in Virginia. The metals and particulate data from Virginia are presented here since it is more current.

Levels of some metals such as iron and cobalt were higher, although not above benchmarks, in Virginia and Silver Bay than in other regions of the state. The metals measured in Hibbing in 1997-1998 were somewhat elevated compared to other locations in Minnesota, but were not as high as the concentrations found in Virginia and Silver Bay. This may be due to the mining activities that occur in the region.

In 1997-1998, carbon tetrachloride and formaldehyde were monitored at levels above risk thresholds for cancer. Since that time, levels of carbon tetrachloride at monitoring locations around the state have been decreasing due to a production phase-out in 1996. It is unlikely that current carbon tetrachloride levels are above benchmark values. Formaldehyde concentrations are above risk thresholds for cancer at all Minnesota monitoring sites. The largest sources of direct emissions of formaldehyde are mobile sources and uncontrolled wood-burning.

The table below shows 1997-1998 monitored concentration and risk values for VOCs and carbonyls in Hibbing. The modeled increased risk for the new facility is also listed. All chemicals in this table were *monitored* at the Hibbing monitoring site and were also *modeled* for the HPU facility.

Chemicals monitored and on COPI list	Monitored Values from the Ambient Station			Modeled Increase based on Facility Emissions	
	Average Concentration (ug/m3)	Cancer Risk 10^{-5}	Chronic Noncancer HQ	Cancer Risk 10^{-5}	Chronic Noncancer HQ
Acetaldehyde	0.89	0.20	0.10	0.00	0.00
Benzene	1.02	0.79	0.03	0.06	0.00
Carbon tetrachloride	**0.79**	**1.18**	0.02	0.00	0.00
Chlorine	0.01		0.03		0.04
Chlorobenzene	0.06		0.00		0.00
Chloroform	0.08		0.00		0.00
Ethyl benzene	0.36		0.00		0.00
Ethylene dibromide (Dibromoethane)	<0.03*	<0.67*	<0.00*	0.00	0.00
Ethylene dichloride (1,2-Dichloroethane)	0.05	0.12	0.00	0.00	0.00
Formaldehyde	**1.56**	**2.03**	0.52	0.02	0.01
Methyl bromide (Bromomethane)	0.06		0.01	0.00	0.00
Styrene	0.12		0.00		0.00
Tetrachloroethylene (Perchloroethylene)	0.28	0.16	0.01	0.00	0.00
Toluene	2.09		0.01		0.00

Trichlorofluoromethane (CFC-11)	1.72		0.00		
Vinyl chloride	<0.07*	<0.06*	<0.00*	0.00	0.00
Xylenes	1.53		0.02		0.00

* Below detection limits

The table below shows 2003 monitored concentration and risk values for metals from the Virginia monitoring location. The modeled increased risk for the new facility is also listed.

Chemicals monitored and on COPI list	Monitored Values from the Ambient Station			Modeled Increase based on Facility Emissions	
	Average Concentration (ug/m3)	Cancer Risk 10^{-5}	Chronic Noncancer HQ	Cancer Risk 10^{-5}	Chronic Noncancer HQ
Antimony	0.0018*		0.01*		0.00
Arsenic	0.0017*	0.72*	0.055*	1.90	0.15
Barium	0.013*		0.027*		0.002
Cadmium	0.0018*	0.31*	0.088*	0.00	0.002
Chromium (Total)	***0.0018****	***2.2****	0.018*	.03	0.023
Lead	0.010*	0.013*		0.00	
Manganese	0.064		0.32		0.027
Nickel	0.0010*	0.047*	0.020*	0.00	0.004
Selenium	0.0014*		0.0001*		0.000
Zinc	0.0058*				

* Below detection limits

Total chromium was over the health benchmark for chromium VI. However, monitoring in California and nation-wide monitoring for EPA's pilot city study indicates that chromium VI concentrations tend to be 30-50 times lower than total chromium concentrations unless there is a nearby source of chromium VI. If similar ratios are found in Minnesota, chromium VI concentrations would be expected to be well below heath benchmarks.

The arsenic cancer value is 0.72 in the monitoring data. The modeled increase for arsenic is already above benchmarks for cancer risk. The combined total of monitored values and modeled values would suggest that there is an increased cancer risk of more than 2 in 100,000 from arsenic.

All of the particle concentrations measured at the Virginia monitoring station are below standards. The standard for PM_{10} is 150 µg/m^3 (24 hour) and 50 µg/m^3 (annual). The standard for $PM_{2.5}$ is 65 µg/m^3 (24 hour) and 15 µg/m^3 (annual).

Monitored Concentrations of Particulates in µg/m^3, 2000-2004						
	TSP		PM_{10}		$PM_{2.5}$	
Year	Max 24-Hour	Annual Average	Max 24-Hour	Annual Average	Max 24-Hour	Annual Average
2000	125	33	31	15	24	7.5
2001	74	30	29	14	20	6.8
2002	90	39	56	17	34	7.0
2003	111	40	72	18	21	6.4

2004	76	32	36	14	18	5.5

No Minnesota monitoring data are available for PAHs or POM.

Urban areas generally have higher concentrations of air toxics that are associated with motor vehicles. These compounds include acetaldehyde, benzene, ethylebenzene, formaldehyde, toluene and xylenes. As with many of the individual pollutants, the total cumulative risk tended to increase somewhat with population. The correlation was better for cancer risk than noncancer risk. While population is an important indicator of risk, other factors such as point sources and monitor location are also important.

31. What multimedia issues may need to be addressed? How are multimedia pathways relevant to this facility?

See # 24 and # 25 for additional information on the multimedia pathway.

32. Describe any community concerns:

In the past, there have been complaints reported to MPCA about the blowing dust from the facility. The facility placed slats on the fence to help mitigate the dust issues. There are residents living directly across from the facility, so this may remain an issue. There have also been complaints of a sulfur smell.

33. Other Relevant Information:

Virginia Department of Public Utilities is partnering with the Hibbing Public Utility to lease boilers to Laurentian Energy in a twenty year contract to sell electricity to Xcel's grid. The production of electricity via the Laurentian Energy Authority will help fulfill Xcel's mandate to produce 30% of their electricity from biomass.

During a site visit conducted by the MPCA, staff noted what appeared to be coal dust on paved areas. Additional permit conditions will require the facility to sweep the area.

MPCA staff were able to determine dispersion factor differences in relation to distance from the DISPERSE modeling used in this AERA. The dispersion factors used in this AERA are based on the original stack height, which is 42 feet shorter than the proposed stack height. MPCA staff assume that greater dispersion will occur. MPCA staff determined that for the coal boilers the dispersion factors decrease by a factor of ten at one kilometer from the facility. The wood boiler shows a decrease in dispersion factors at a factor of ten at three to four kilometers from the facility.

STANDARDS

34. Do the emission units in the assessment have a state or federal standard? Specifically, what NESHAP applies, if any?

The existing HPU boilers are subject to the NESHAP standard 40 CFR 63, Subp. DDDDD. The new boiler will be subject upon startup, and the existing boilers will be subject to the standard by the compliance date September 23, 2007 (approximately 2.5 years from now). The new boiler, therefore, has Maximum Achievable Control Technology (MACT) for control of hazardous air pollutants and Best Available Control Technology (BACT) controls for CO, NOx, and PM.

35. If the project proposer shows that risk is above threshold, was feasible and reasonable control used?

The new boilers will be subject to federal new source review, and NESHAP regulations. This means that they will be fitted with both Best Available Control Technology and Maximum Achievable Control Technology. The existing boilers are fitted with electrostatic precipitators for particulate control, and burn low sulfur coal for sulfur dioxide control. The existing boilers are not being modified, and under new source review, are not considered part of the project.

Describe the overall conservativeness of the assessment with regard to:

a) Emission estimates:
Hourly emission rates were calculated assuming full capacity operation. Annual emissions are obtained by assuming continuous operation (8760 hours per year). Annual emission rates are typically reported in tons per year. To convert pounds per hour into tons per year the hourly emission rate must be multiplied by 8760 hours and then divided by 2000 (amount of pounds in a ton). This method for calculating potential emissions is conservative, since most emission units are designed to operate at a higher capacity than what will be utilized.

b) Dispersion modeling:
Dispersion factors are probably conservative due to unpaired events. Unpaired events mean maximum impacts are added together even though they may actually occur at different times or different locations. The conservatism due to unpaired events is probably fairly small at LEA-Hibbing due to the close proximity and considerable dispersion similarity of the existing coal-fired boilers; this is somewhat less important for the new (well controlled) wood-fired boiler.

LEA-Hibbing's recent decision to build a new (taller) common stack for coal-fired boilers 1A and 2A will help improve dispersion from these most culpable emission sources for most key air toxic pollutants and criteria air pollutants.

c) Risk:
The chronic cancer inhalation risk was based on 70 years of exposure to maximum air concentrations. The surrogate toxicity values used for the risk drivers may over-predict the risks for several of the exposure scenarios. The multipathway analysis is a screening assessment designed to be conservative. A quantitative analysis for the fish consumption pathway for the four lakes within a 3 kilometer radius of the facility is not included in this assessment.
The health risks in this assessment also do not account for health risks from criteria pollutants.

Considerations for analysis:

1. *Issues that can be clarified through a refined analysis:*
    - Refined dispersion modeling could be performed to decrease modeled risks from all pathways assessed in an AERA.
    - Refinement of risk driver emission factors would clarify the analysis.
    - The percent of NO_2 that comes from NO_x could be refined with additional OLM modeling or stack test data, decreasing the hazard index for acute exposure.
    - Further refinement of the multimedia pathways could be obtained by using IRAP or HHRAP models.
    - A fish pathway analysis may provide more information.

2. *Issues that a refined analysis will not resolve:* None

3. *Issues for informational purposes only:* Obtaining information on risks from direct emissions of particulates from this facility.

Staff Recommendations:
The assessment was performed in accordance with the AERA guidance. Additional dispersion modeling could be performed using the new proposed stack height for boilers 1A and 2A (i.e., new common stack height of 155 feet), and also to refine the current modeling (e.g., ozone limiting method), and refined emission estimates (e.g., stack testing for initial NO_2/NO_X ratio). Further refinement would provide a more accurate and less conservative (i.e., lower impacts) assessment of what will actually occur with this project.

Are there permit requirements necessary for this facility? Include draft language.
Modeling was not required for sulfur dioxide under the new source review program. However, as part of the permitting review, previous dispersion modeling required by the Title V permit previously issued to the facility did show compliance with ambient sulfur dioxide standards, but MPCA policy for emissions estimation was not followed. Accordingly, the MPCA required new dispersion modeling to be submitted. That modeling showed that the emission limit needed to be reduced for the three existing coal fired boilers, and the stack extended. Those requirements will be made permit conditions, and must be completed prior to startup of the new wood fired boiler.

Risk Management recommendation and rationale:
After consideration of all of the information provided in this AERA the Risk Managers conclude that the facility air risk analysis is adequate to assess the impacts. The new project as assessed shows that impacts from the wood fired boiler are below health benchmarks except for farmer cancer risk but the information provided by the facility indicates that no or very limited farming occurs within 3 kilometers of the facility.

For the total facility the health benchmarks are exceeded in several areas. However, based on the following factors a risk management decision has been made that the facility as proposed will not have significant environmental or health impacts and will provide other social benefits to the area.

- To comply with SO_2 standards the stack height will be increased by 42 feet or a combination of activities directed at reduction of the SO_2 emissions will required in the permit. This will also reduce the modeled concentrations of air toxics around the facility;
- The models used were screening models which generate a higher impact assessment than is actually anticipated to result from the facility;
- Use of surrogate toxicity values for chromium compounds, arsenic compounds and dioxins and furans (which are some of the key risk drivers) overstate the impact;
- The analysis assumed that 100 percent of the NO_x coming from the stack is NO2 this is a conservative assumption and the primary driver for the acute risk;
- Limited or no farming occurs within 3 kilometers of the facility eliminating the concern about farmer risk;
- The existing facility fulfills electrical and steam heat needs within the community which is valued by the residence;
- There will be a reduction in total mercury from the two facilities in the Laurentian project as a whole; and
- The objectives set forth by the Legislature to increase the use of alternative fuels with a focus on renewable energy.

Section Manager Signature and Date:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Emission Calculations