

**AIR EMISSION PERMIT NO. 07100026- 001
IS ISSUED TO**

Itasca Power Company

Northome Biomass Plant
East State Highway 1
Northome, Koochiching County, MN 56661

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

Permit Type	Application Date
Total Facility Operating Permit	06/05/2000

This permit authorizes the permittee to operate and construct 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 as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

Permit Type: State; Syn Min Part 70

Issue Date: February 6, 2001

Expiration: 5 years after permit issuance
All Title I Conditions do not expire.

Rodney E. Massey, P.E.
District Director

For Karen A. Studders
Commissioner
Minnesota Pollution Control Agency

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NOTICE TO THE PERMITTEE:

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

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

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

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

PERMIT SHIELD:

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

FACILITY DESCRIPTION:

Itasca Power Company is proposing to build a steam electric generating facility fueled by wood residue. The generating capacity will be approximately 15 MW. Two 100 MMBtu/hr boilers will provide the steam for the generator. The wood residue utilized will be bark, sawdust, or slash. The bark and sawdust will come from local sawmills, paper, and board plants, while loggers will bring in slash from local forests. The facility will also have a wood chipping facility, which will debark and then chip whole logs. The bark will be burned at the facility and the wood chips will be backhauled to the local paper and board plants so that the trucks will not be going back empty.

This permit includes enforceable permit limits so that the facility will be classified as a synthetic minor source for the federal, Part 70 (also known as Title V) permit program. A source is subject to this program if the potential emissions of any criteria pollutant from the facility is greater than 100 tons per year. These limits also preclude the need to complete an environmental assessment worksheet (EAW) under the mandatory category at Minn. Rule 4410.4300, subp. 15 (Air Pollution) for this project.

The main boilers for the facility will be manifolded to a one electrostatic precipitator (ESP) to remove particulates and a low temperature oxidation (LoTOx) system to remove nitrogen oxides (NOx). The LoTOx system works by first, oxidizing NOx to higher oxidized forms of nitrogen, N₂O₅ for example, and then second, scrubbing these highly oxidized forms of nitrogen from the gas stream, eventually converting them to HNO₃ (nitric acid). The standby boiler is controlled by a multiclone for particulate emissions. Other emissions units include the ash loadout/bin, the wood chipping facility, and the emergency generator. These units are uncontrolled. Truck traffic will be a source of fugitive particulate emissions.

TABLE A: LIMITS AND OTHER REQUIREMENTS

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant

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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
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 and Minn. R. 7007.0800, subp. 16(J)
Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C.	Minn. R. ch. 7017
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
Monitoring Equipment: Install or make needed repairs to monitoring equipment within 60 days of initiating operation of the facility 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
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.	Minn. R. 7019.1000, subp. 3
Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 2. At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over.	Minn. R. 7019.1000, subp. 2
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. 7019.1000, subp. 1
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. 7019.1000, subp. 1

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Itasca Power Co - Northome Biomass Plant

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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
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)
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
Application for Permit Amendment: If a permit amendment is needed, submit an 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)
Recordkeeping: Maintain records describing any insignificant modifications (as required by Minn. R. 7007.1250, subp. 3) or changes contravening permit terms (as required by Minn. R. 7007.1350 subp. 2), including records of the emissions resulting from those changes.	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 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 the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7030.0010 - 7030.0080
Post-Construction Noise Monitoring Plan: A Post-Construction Noise Monitoring Plan shall be submitted within 90 days after the initial startup of the main boilers (EU 001 and EU 002). The Permittee shall perform noise monitoring to demonstrate compliance with the MPCA noise standards. The Plan shall specify how, when, and at what locations the monitoring will be conducted. The Plan shall be submitted to the MPCA for approval and once approved, the plan is an enforceable part of the permit. Further monitoring shall not be required if the monitoring shows the facility to be in compliance with the MPCA noise standards.	Minn. R. 7007.0800, subp. 2; Minn. R. 7030.0010-7030.0080
The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.	Minn. R. 7007.0800, subp. 16
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)
Emission Inventory Report: due 91 days after end of each calendar year following permit issuance (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
MODELING RELATED REQUIREMENTS	hdr
Construct the facility so that the actual as-built stack parameters ensure equivalent or better dispersion than those contained in the appendix to this permit. This means that the stack heights must be greater than or equal to the values in the appendix, and the stack diameters must be less than or equal to the values in the appendix. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7009.0020; Minn. R. 7007.0800, subp. 2
Modeling Requirement: EU003, EU006, EU001, and EU002 shall not all be operated at the same time. Recordkeeping shall be done in support of this requirement as outlined under each subject item. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7009.0020; Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant

Permit Number: 07100026 - 001

Subject Item: GP 001 Main Boilers**Associated Items:** CE 001 Electrostatic Precipitator - High Efficiency

CE 002 Other

EU 001 North Boiler

EU 002 South Boiler

SV 001 Stack for Main Boilers

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than 0.10 lbs/million Btu heat input . This emission limit does not apply during periods of startup, shutdown, or malfunction.	40 CFR Section 60.43b(c)(1); Minn. R. 7011.0565
Opacity: less than or equal to 20 percent opacity using 6-minute Average except for one six-minute period per hour of not more than 27 percent. This emission limit does not apply during periods of startup, shutdown, or malfunction.	40 CFR Section 60.43b(f); Minn. R. 7011.0565
Nitrogen Oxides: less than or equal to 90 tons/year using 365-day Rolling Sum	Title I Condition: to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15
Carbon Monoxide: less than or equal to 95 tons/year using 365-day Rolling Sum	Title I Condition: to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15
Volatile Organic Compounds: less than or equal to 90 tons/year using 365-day Rolling Sum	Title I Condition: to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15
OPERATIONAL LIMITATIONS	hdr
Operational Limit: The boilers shall only burn wood, meaning: wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including sawdust, sander dust, wood chips, wood scraps, slabs, millings, shavings, and processed pellets made from wood and other forest residues.	Minn. R. 7007.0800, subp. 2; Minn. R. 7011.1201, subp. 48; 40 CFR Section 72.2
METHOD 1 - UTILIZING NO_x CEM DATA The main boilers must operate within the limits as calculated according to the following method which considers CEM data available for the pollutant in question. Once each day the Permittee shall take all of the raw, 3-hour average CEM emission rates (in units of pounds per hour) from the previous day and calculate the daily average emission rate. All 3-hour average values shall be included in the calculation, regardless of the operating status of the boilers. The daily average emission rate shall then be multiplied by 24 to give the daily emissions. The daily emissions shall then be used to calculate a new 365-day rolling sum. This 365-day rolling sum shall be less than 90 tons (180,000 pounds) for NO _x . For the first 364 days after permit issuance, the sum of the daily emissions to that date shall be less than: $L = 40 + (0.137 \cdot d)$, where L = the applicable limit, ton d = the number of days after permit issuance, d	Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Itasca Power Co - Northome Biomass Plant

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<p>METHOD 1 - UTILIZING CO CEM DATA</p> <p>The main boilers must operate within the limits as calculated according to the following method which considers CEM data available for the pollutant in question. Once each day the Permittee shall take all of the raw, 3-hour average CEM emission rates (in units of pounds per hour) from the previous day and calculate the daily average emission rate. All 3-hour average values shall be included in the calculation, regardless of the operating status of the boilers. The daily average emission rate shall then be multiplied by 24 to give the daily emissions. The daily emissions shall then be used to calculate a new 365-day rolling sum. This 365-day rolling sum shall be less than 95 tons (190,000 pounds) for CO.</p> <p>For the first 364 days after permit issuance, the sum of the daily emissions to that date shall be less than:</p> <p>$L = 40 + (0.151 \cdot d)$, where</p> <p>L = the applicable limit, ton d = the number of days after permit issuance, d</p>	<p>Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15</p>
<p>CEM DATA UNAVAILABILITY - Should any CEM data be unavailable for use in the calculation of the daily average emission rate in the previous two requirements (above) due to CEM downtime or malfunction, the available 3-hour average CEM emission rates (in units of pounds per hour) for the day in question shall be used to calculate the daily average emission rate. The daily average emission rate shall then be multiplied by the total number of hours in the day for which data was available to obtain the daily emissions.</p>	<p>Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15</p>
<p>METHOD 2 - UTILIZING PERFORMANCE TEST DATA</p> <p>The main boilers must also operate within the limits as calculated according to the following method which considers testing data available for the pollutant in question. The allowable operating hours for the main boilers shall be calculated according to the following formula which considers the most recent performance test data available for the pollutant in question.</p> <p>$H = 180,000 \text{ lb/yr} \cdot (1/T_n)$</p> <p>H = annual hours of operation limit, hr/yr T_n = the most recent performance test result for the pollutant in question (n), lb/hr</p> <p>When a new performance test is conducted, the new test result must be used in the formula above (in place of the previous test result), beginning the first day of the first calendar month following the receipt of a performance test approval letter from the agency.</p>	<p>Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15</p>
<p>METHOD 2 - continued</p> <p>Until a performance test can be conducted, the following emission factor will be used for T_n in the formula above:</p> <p>VOC: 19.2 lb VOC/hr</p> <p>Once each day the Permittee shall make a record of the number of operating hours EITHER EU 001 or EU 002 operated for the previous day. This daily total shall then be used to calculate a new 365-day rolling sum. This 365-day rolling sum shall be less than H, as calculated above.</p> <p>For the first 364 days after permit issuance the value of H (in hours) shall be calculated as:</p> <p>$H = 0.4 (H') + [(0.6/364) \cdot H' \cdot d]$, where</p> <p>H' = H as defined in the previous item d = days after permit issuance</p>	<p>Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15</p>
<p>COMPLIANCE WITH ALL LIMITS: The Permittee shall use Method 1 (above) for CO and NO_x. The Permittee shall use Method 2 (above) for VOC. The Permittee shall be in compliance with the limits as calculated for each pollutant, according to the methods above, at all times.</p>	<p>Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15</p>
<p>CONTROL EQUIPMENT MONITORING REQUIREMENTS</p>	<p>hdr</p>
<p>Control Equipment Monitoring: The Permittee shall operate CE 001 with no less than the minimum number of fields online than during the most recent performance test that measured particulate emissions less than the applicable limit(s) in Table A of this permit.</p>	<p>Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 1; Minn. R. 7007.0800, subp. 14</p>

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Itasca Power Co - Northome Biomass Plant

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Control Equipment Monitoring/Recordkeeping: The Permittee shall record the minimum number of fields online in CE 001 once each day that either EU 001 or EU 002 are operating. If the minimum number of fields are found not to be online, take corrective action (as outlined in the Operation and Maintenance plan for the facility) within 24-hours of discovery to return the minimum number fields online. Make a record of all corrective actions taken.	Title I Condition: monitoring for Title I Condition to limit potential emissions to less than major source levels under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 1; Minn. R. 7007.0800, subp. 14
TESTING REQUIREMENTS	hdr
Initial Performance Test: due 180 days after Permit Issuance to measure particulate matter (PM) and volatile organic compounds (VOC).	Title I Condition: testing for Title I Condition under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15; 40 CFR Section 60.46b(b); Minn. R. 7017.2020, subp. 1
Performance Test Notification (written): due 30 days before the Performance Test.	Minn. R. 7017.2030, subp. 1
Performance Test Plan: due 30 days before the Performance Test	Minn. R. 7017.2030, subp. 2
Performance Test Pre-test Meeting: due 7 days before the Performance Test.	Minn. R. 7017.2030, subp. 4
Performance Test Report: due 45 days after the Performance Test.	Minn. R. 7017.2035, subps. 1 and 2
Performance Test Report - Microfiche Copy: due 105 days after the Performance Test.	Minn. R. 7017.2035, subp. 2
Testing Frequency Plan: due 60 days after the Initial Performance Test. 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.	Minn. R. 7017.2020, subp. 1
NOTIFICATION REQUIREMENTS	hdr
CEMS REQUIREMENTS	hdr
Emissions Monitoring: the Permittee shall install and use a CEMS to measure NOx and CO. The Permittee shall install and use a COMS to measure opacity.	Title I Condition: monitoring for Title I Condition under 40 CFR Section 52.21; 40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15; 40 CFR Section 60.48b(a); Minn. R. 7017.1006
CEM Certification Test: due 60 days after achieving maximum capacity but not later than 180 days after initial startup.	40 CFR Section 60.13(b); Minn. R. 7017.1050, subp. 1
CEMS Certification Test Plan: due 30 days before CEMS Certification Test.	40 CFR Section 60.7(a)(5); Minn. R. 7017.1060, subp. 1 & 2
CEMS Certification Test Pretest Meeting: due 7 days before CEMS Certification Test.	Minn. R. 7017.1060, subp. 3
CEMS Certification Test Report: due 45 days after CEMS Certification Test.	Minn. R. 7017.1080, subp. 1, 2, & 4; 40 CFR Section 60.13(c)(2)
CEMS Certification Test Report - Microfiche Copy: due 105 days after CEMS Certification Test.	Minn. R. 7017.1080, subp. 3
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 Part 60, App. F; section 3
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test. Follow the procedures in 40 CFR pt. 60, Appendix F.	40 CFR Part 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 calendar quarter in which the CEMS RATA was conducted.	Minn. R. 7017.1180, subp. 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 Part 60, Appendix F, section 4.1; 40 CFR Section 60.13(d)(1); Minn. R. 7017.1170, subp. 3
Cylinder Gas Audit: due before end of each calendar quarter following CEM Certification Test but in no more than three calendar quarters per calendar year. The RATA shall be conducted during the calendar quarter in which a CGA is not performed.	40 CFR Part 60, Appendix F, section 5.1.2; Minn. R. 7017.1170, subp. 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), subp. 6; Minn. R. 7017.1090, subp. 1
Acceptable monitor downtime includes reasonable periods as listed in Items A, B, C and D of Minn. R. 7017.1090, subp. 2.	

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Itasca Power Co - Northome Biomass Plant

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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
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)
Records of Startup, Shutdown, or Malfunction: Any owner or operator subject to the provisions of this part shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.	40 CFR Section 60.7(b)
COMS REQUIREMENTS	hdr
COMS Certification Test: due 60 days after achieving maximum capacity but not 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.	40 CFR Section 60.7(a)(5); 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, subps. 1, 2, & 4
COMS Certification Test Report - Microfiche Copy: due 105 days after COMS Certification Test	Minn. R. 7017.1080, subp. 3
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 Daily Calibration Drift (CD) Check: The CD shall be quantified and recorded at zero (low-level) and upscale (high-level) opacity at least once daily. The COMS must be adjusted whenever the calibration drift (CD) exceeds twice the specification of PS-1 of 40 CFR 60, Appendix B.	Minn. R. 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 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
COMS Monitoring Data: Reduce all data to 6 minute averages. Opacity averages shall be calculated from all equally spaced consecutive 10-second (or shorter) data points in the 6 minute averaging period.	Minn. R. 7017.1200, subp. 1, 2, & 3; 40 CFR '60.13(e)(1); 40 CFR '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

TABLE A: LIMITS AND OTHER REQUIREMENTS

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant

Permit Number: 07100026 - 001

Subject Item: EU 003 Standby Boiler**Associated Items:** CE 004 Multiple Cyclone w/o Fly Ash Reinjection - Most Multiclones
SV 002

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input	Minn. R. 7011.0515, subp. 1
Sulfur Dioxide: less than or equal to 4.0 lbs/million Btu heat input	Minn. R. 7011.0515, subp. 1
Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0515, subp. 2
OPERATIONAL LIMITS	hdr
Operational Limit: The boiler shall only burn wood, meaning: wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including sawdust, sander dust, wood chips, wood scraps, slabs, millings, shavings, and processed pellets made from wood and other forest residues.	Minn. R. 7007.0800, subp. 2; Minn. R. 7011.1201, subp. 48; 40 CFR Section 72.2
Operating Hours: less than or equal to 4000 hours/year for the first year after permit issuance. The limit will become 1000 hours/year for the following years.	40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15
Recordkeeping: for each day of operation of EU003, make a record of the number of hours the unit operated.	Minn. R. 7007.0800, subp. 5
CONTROL EQUIPMENT REQUIREMENTS	hdr
Pressure Drop: greater than or equal to 2.5 inches of water column and less than or equal to 4 inches of water column	Minn. R. 7007.0800, subp. 2
Monitoring of Pollution Control Equipment: the Permittee shall monitor and record the pressure drop across the multiclone once each operating day. If the pressure drop is found to be outside the range in this permit, take corrective action (as outlined in the operation and maintenance plan for the facility) within 24-hours of discovery to restore the parameter to the proper range. Make a record of all corrective actions taken.	Minn. R. 7007.0800, subp. 5

TABLE A: LIMITS AND OTHER REQUIREMENTS

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant

Permit Number: 07100026 - 001

Subject Item: EU 005 Ash Bin Vent**Associated Items:** CE 003 6% or Greater Moisture Content

SV 004 Ash tank vent

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011. 0735.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent opacity	Minn. R. 7011.0715, subp. 1(B)

TABLE A: LIMITS AND OTHER REQUIREMENTS

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant

Permit Number: 07100026 - 001

Subject Item: EU 006 Emergency Generator**Associated Items:** SV 005 Emerg Gen Vent

What to do	Why to do it
EMISSION LIMITS	hdr
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
OPERATIONAL LIMITS	hdr
Operating Hours: less than or equal to 500 hours/year	40 CFR Section 70.3(b); Minn. R. 7007.0250, subp. 5; Minn. R. 4410.4300, subp. 15
Recordkeeping: for each day of operation of EU005, make a record of the number of hours the unit operated.	Minn. R. 7007.0800, subp. 5
Recordkeeping: for each shipment of fuel oil received, obtain a signed certification from the fuel supplier of the weight percent of sulfur in the fuel oil. If the facility uses "biodiesel", recordkeeping showing the amount of fuel used for the year and a signed certification shall be made annually.	Minn. R. 7007.0800, subp. 5

TABLE B: SUBMITTALS

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant
Permit Number: 07100026 - 001

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

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant

Permit Number: 07100026 - 001

What to send	When to send	Portion of Facility Affected
Application for Permit Reissuance	due 180 days before expiration of Existing Permit	Total Facility
Notification	due 14 days after Initial Startup of the main boilers (EU 001 and EU 002)	GP001
Notification	due 60 days after Initial Startup of the Monitor (COMS)	GP001
Notification	due 60 days before Initial Startup of the Monitor (CEMS). The notification shall include plans and drawings of the system.	GP001

TABLE B: RECURRENT SUBMITTALS

02/06/01

Facility Name: Itasca Power Co - Northome Biomass Plant

Permit Number: 07100026 - 001

What to send	When to send	Portion of Facility Affected
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (CEMS and COMS). Submit Deviations Reporting Form DRF-1, as amended. The EER must contain all of the information requested in 40 CFR 60.7(c). The EER shall indicate all periods of monitor bypass and all periods of exceedances of the limit including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions.	GP001
Semiannual Deviations Report	due 30 days after end of each calendar half-year following Permit Issuance. The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occurred, the Permittee shall submit the report stating no deviations.	Total Facility
Compliance Certification	due 31 days after end of each calendar year following Permit Issuance (for the previous calendar year). To be submitted on a form approved by the Commissioner. This report covers all deviations experienced during the calendar year.	Total Facility

APPENDIX MATERIAL**Facility Name: Itasca Power Co - Northome Biomass Plant****Permit Number: 07100026-001**

These modeling parameters were used in screening modeling using the EPA model SCREEN3. The results of the modeling can be found in the attachments to the technical support document for this permit.

TABLE 1 - Modeled Emission Rates (lb/hr)

Stack #	TSP	PM₁₀	SO₂	NO_x	CO
001 - Main Boilers	3.1	1.2	NA	20.9	18.5
002 - Standby Boiler	5.9	3.6	NA	7.6	3.0
003 - Emerg. Gener.	0.74	0.74	NA	28.6	5.8

TABLE 2 - Modeled Stack Parameters

Stack #	Height (ft)	Diameter (ft)	Flow Rate (acfm)	Temperature (°F)	Orientation
001	80	7	74,400	120	Vertical
002	69	3	12,000	350	Vertical
003	81	0.83	5,720	720	Vertical

TECHNICAL SUPPORT DOCUMENT
For
AIR EMISSION PERMIT NO. 07100026-001

This Technical Support Document (TSD) is for all the interested parties of the draft permit. The purpose of this document is to set forth the legal and factual basis for the draft permit conditions, including references to the applicable statutory or regulatory provisions.

1. General Information

1.1. Applicant and Stationary Source Location:

Owner and Operator Address and Phone Number (list both if different)	Facility Address (SIC Code:)
Itasca Power Company PO Box 457 Spring Lake, MN 56680 Mr. Dean Sedgwick (218) 798-2700	Northome Biomass Plant East State Highway 1 Northome, MN 55 Koochiching County

1.2. Description of the facility

Itasca Power Company (IPC) is proposing to build a steam electric generating facility fueled by wood residue. The generating capacity will be approximately 15 MW. Two 100 MMBtu/hr boilers will provide the steam for the generator. The wood residue utilized will be bark, sawdust, or slash. The bark and sawdust will come from local sawmills, paper, and board plants, while loggers will bring in slash from local forests. The facility will also have a wood chipping facility, which will debark and then chip whole logs. The bark will be burned at the facility and the wood chips will be backhauled to the local paper and board plants so that the trucks will not be going back empty.

This permit includes enforceable permit limits so that the facility will be classified as a synthetic minor source for the federal, Part 70 (also known as Title V) permit program. A source is subject to this program if the potential emissions of any criteria pollutant from the facility is greater than 100 tons per year. These limits also preclude the need to complete an environmental assessment worksheet (EAW) under the mandatory category at Minn. Rule 4410.4300, subp. 15 (Air Pollution) for this project.

The main boilers for the facility will be manifolded to a one electrostatic precipitator (ESP) to remove particulates and a low temperature oxidation (LoTOx) system to remove nitrogen oxides (NOx). The LoTOx system works by first, oxidizing NOx to higher oxidized forms of nitrogen, N₂O₅ for example, and then second, scrubbing these highly oxidized forms of nitrogen from the gas stream, eventually converting them to HNO₃ (nitric acid).

The standby boiler is controlled by a multiclone for particulate emissions. Other emissions units include the ash loadout/bin, the wood chipping facility, and the emergency generator. These units are uncontrolled. Truck traffic will be a source of fugitive particulate emissions.

A request for an informal public meeting was received during the public notice period for the permit. This meeting was held on December 5, 2000 in Northome. The end of the public notice period was therefore extended until December 12, 2000. A copy of the responses to questions received during the public notice period is attached to this document as Attachment 7.

Two changes were made to the permit as a result of public comment. One was to add post construction noise monitoring. Another was a clarification to the operating restriction set as a result of the screening modeling done. The permit condition at issue restricted which emission units could be run at the same time. To allow the emergency generator to run at the same time as the main boilers, as was requested by IPC, the stack height on the standby boiler was extended by one meter. In addition, to allow this change the permit limits on the main boilers were lowered by nine tons (to 90 tons) for NO_x and 4 tons (to 95 tons) for CO.

Some other typographical errors in this document and its attachments were also corrected during the public notice period.

1.3. Description of any changes allowed with this permit issuance

This permit allows the construction and operation of this new facility.

1.4. Description of all amendments issued since the issuance of the last total facility permit and to be included in the Part 70 Permit.

None, this is a new facility.

1.5. Facility Emissions:

Table 1. Total Facility Potential to Emit Summary:

EU #	GP#	Emission Unit Description	PM Tpy	PM ₁₀ tpy	SO ₂ tpy	NOx tpy	CO Tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAPs tpy
	001	Main Boilers	13.5	5.4	21.7	90	95	90	0.04	1.3	3.7
003		Standby Boiler	8.4	3.0	0.4	3.8	1.5	1.4	<0.01	<0.1	0.1
004		Wood Chipping	0.6	0.6				7.9			
005		Ash Loadout	9.7	9.7							
006		Emerg Generator	0.2	0.2	1.1	7.2	1.5	0.2	NA	NA	NA
		Truck Traffic	22.8	4.6							

	PM Tpy	PM ₁₀ tpy	SO ₂ tpy	NOx Tpy	CO Tpy	VOC tpy	Pb Tpy	Single HAP tpy	All HAPs tpy
Total Facility Limited Potential Emissions	55.2	23.4	23.1	97*	97*	98*	0.04	1.3	3.8
Total Facility Actual Emissions	**								

* Permit limits do not allow the main boilers to be operated at the same time as the standby boiler and emergency generator.

**The facility has not been built yet, so actual emissions information is not available. The actual emissions are likely to be close to the potential emissions since the facility will be run around the clock, year-round, except for preventative maintenance related downtime.

Table 2. Facility and Permit Classification

Classification (put x in appropriate box)	Major/Affected Source	*Synthetic Minor	*Minor
PSD		PM, PM ₁₀ , NO _x	CO, VOC, SO ₂
NAAR (not applicable)			
Part 70 Permit Program		PM, PM ₁₀ , NO _x , CO, VOC	SO ₂

* Refers to potential emissions that are less than those specified as major by 40 CFR 52.21, 40 CFR pt. 51 Appendix S, and 40 CFR pt. 70.

2. Regulatory and/or Statutory Basis

Summary Regulatory and/or Statutory Basis of the Emission or operational Limit

Regulatory Overview of Facility

EU or GP #	Applicable Regulations	Comments:
Facility	40 CFR pt. 70 40 CFR § 52.21 Minn. R. 4410.4300, subp. 15	Title I Conditions to limit the emissions from the facility below the relevant thresholds
GP001	40 CFR pt. 60, subp. Db	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units
EU003	Minn. R. 7007.0515	Standards of Performance for New Indirect Heating Equipment
EU006	Minn. R. 7007.2300 Minn. R. 7009.0020	Standards Of Performance For Stationary Internal Combustion Engines and Ambient Air Quality Standards

3. Technical Information

3.1. Emission Inventory

The emission calculations performed for this facility can be found in Attachment 1 to this document.

3.1.1. Main Boilers (GP 001) and Standby Boiler (EU 003)

The main boilers are reciprocating grate boilers. These boilers will be manifolded to one electrostatic precipitator (ESP) for particulate control and a low temperature oxidation (LoTOx) system to control NO_x. The standby boiler is also wood residue fired and is controlled by a multiclone.

Most of the emission factors used to calculate the emissions from these sources were taken from the draft version of US EPA's AP-42 section 1.6 on wood-fired boilers dated December 15, 1999. The emissions factors for nitrogen oxides (NO_x), 2.3 lb. NO_x/ton (or 0.25 lb. NO_x/MMBtu), and carbon monoxide 0.82 lb. CO/ton (or 0.09 lb. CO/MMBtu) were proposed by the boiler manufacturer.

Since the emission factors used, along with any applicable control efficiency numbers, were critical in calculating the emission rates and also the need for environmental review, extensive work was done reviewing all available data to determine if the emission calculations presented were reasonable. To avoid environmental review, the emissions of each criteria pollutant from the facility must be less than 100 tons per year. Along with the draft and current versions of AP-42, performance test data on other wood-fired boilers in Minnesota, and the BACT/LAER clearinghouses for California and EPA were all examined for NO_x and CO data from similar emission units. This data was plotted for each pollutant (see Attachments 2 and 3 to this document).

The uncontrolled emission factor used by IPC for NO_x is slightly higher than that proposed in the draft version of AP-42 (0.20 lb. NO_x/MMBtu) and can be seen to be generally on the upper end of the values collected, so it is deemed to be conservative. Using the manufacturer's emission factor, the uncontrolled NO_x emissions from the main boilers are over 100 tons per year.

The emission factor for CO can be seen to be extremely low compared to the other data collected. In fact, it is the third lowest data point in the entire data set. It is entirely outside values suggested in the draft section of AP-42 (0.61 to 0.72 lb./MMBtu). It is possible that the boiler could be optimized to reduce CO emissions (high temperature, excess air), but these conditions would contribute to higher NO_x emissions. Considerable scatter can be seen in the data set, showing just how variable emissions of CO can be from day to day. Using the manufacturer's emission factor, the CO emissions from the boilers are 92 tons per year.

IPC is proposing to use a new NO_x control technology termed Low Temperature Oxidation (LoTO_x) to bring the emissions of NO_x from the main boilers down to a level so that the emissions from the entire facility will be below the 100 tons per year threshold. The LoTO_x system is composed of a reactor and a packed bed scrubber. First heat must be removed with heat exchangers so that the half life of ozone is not so short in the reactor that it does not have time to react with NO_x. Ozone becomes increasingly unstable at high temperatures, i.e. greater than 400°F. Ozone is then injected in the reactor, which oxidizes the NO_x to highly oxidized forms of nitrogen, N₂O₅ for example. The next step involves scrubbing these highly oxidized forms of nitrogen. While NO and NO₂ are relatively insoluble, higher oxidized forms of nitrogen are soluble and can be removed by a packed-bed type scrubber which maximizes the amount of contact between the scrubbing liquid and the air. Ozone is generated on-site from oxygen. Oxygen is either generated on-site or purchased. A NO_x monitor on the inlet to system is used to match the necessary ozone feed rate to incoming NO_x emission rate. Adjustment of the scrubbing water pH will be necessary.

This technology has been applied to other sources. A mobile demonstration unit has treated a slipstream from a Pennsylvania coal-fired power plant to less than 5 ppmv. A full-scale installation at a 400HP natural gas fired boiler in California reduced NOx emissions from about 25 ppmv to less than 5 ppmv. Another full-scale installation treating emissions from an acid pickling process removed NOx from a concentration of 1100 ppmv to 100 ppmv. Three more full-scale installations are underway, treating emissions from a 1000 HP gas-fired boiler in California, a 25 MW coal-fired power plant in Ohio and a chemical process in Pennsylvania.

MPCA staff received considerable technical information on this technology. After reviewing the information, staff made the determination that it was reasonable to install this technology and see how well it will work over the long term. The LoTOx system at IPC will need to remove NOx at around 50 % control efficiency to keep the emissions from the facility below the 100 tons per year threshold. The information presented by the vendor showed that the system performed well over the short term.

Staff are concerned over the long-term feasibility of this technology due to cost considerations. Operation and maintenance cost data is not available since no full-scale installation has operated this technology for over a year. Staff from SCAQMD (the air permitting authority in the Los Angeles area) were contacted regarding two installations of this control technology in their area. They stated that the LoTOx system has now been replaced as BACT for small natural gas boilers by ultra-low NOx burners and selective catalytic reduction (SCR) because this system can perform as well as the LoTOx system, but at a lower cost. Ultimately the financial risk for the long-term operation and maintenance cost of this system is borne by IPC. If IPC wanted to replace this system in the future, they would have to look at SCR, at a minimum, based on control technology available today.

An alternate system to control NOx from thermal energy using phosphorus to react with oxygen to generate ozone was also considered but was rejected by MPCA staff because at this time it has not been demonstrated full-scale.

From the preceding discussion, it can be seen that there is some uncertainty associated with the emissions of NOx (due to the new control technology being proposed) and CO (due to the very low emission factor used) from the facility. A combination of testing and continuous emission monitors at the facility will measure the actual emissions after it is built. What would happen if the facility proved to generate emissions at higher rates than projected in their permit application? While the permit for the facility can be reissued as a part 70 permit later, environmental review is not particularly relevant after a facility is already built. Instead of spending more time examining the emission rates, a decision was made to tie the annual operating hours the facility is allowed to operate, to its emission rate. That way, if the facility turns out to be emitting less than or equal to what is projected, its operations are unaffected. On the other hand, should the facility emit more than projected, the number of hours it would be allowed to operate annually would be reduced accordingly. Under this approach the Part 70 permit program, and more importantly the environmental review process, can not be circumvented.

The standby boiler and the emergency generator have annual operating hour restrictions that reduce their potential to emit and more accurately reflect how they will be operated. The

standby boiler will be operated more during the first year after permit issuance, due to the construction and shakedown activities with the main boilers. In addition, the permit has a requirement that limits these two units from operating at the same time as the main boilers.

3.1.2. Emergency Generator and Other Sources

AP-42 emission factors for diesel fuel-fired generators were used to estimate the emissions from the emergency generator along with emission factors provided by the applicant, should the facility choose to use biodiesel. Since two fuels were being considered, worst case emission factors for each pollutant were used.

Other emission sources include ash unloading, wood chipping, and truck traffic. Stack test information from the chipping building at International Paper in Sartell was used to estimate VOC and particulate emissions from wood chipping. Minn. R. 7011.0715 was used to estimate emissions from ash unloading. AP-42 procedures for estimating particulate emissions from unpaved roads were used for fugitive, truck traffic emissions. No control activities were assumed in any of these calculations.

3.2. Regulatory Applicability Analysis

3.2.1. Federal

3.2.1.1. Prevention of Significant Deterioration (PSD)

The major source threshold for this facility is 250 tons per year since it is not one of the specifically listed source categories which has a 100 ton per year threshold. IPC is a “synthetic minor” source due to the air pollution control equipment proposed for the facility. Since this program only applies to major sources, IPC is exempt at this time.

3.2.1.2. Title V

IPC must comply with the Title V (part 70) permit program if the emissions of any air pollutant exceed 100 tons per year. This does not include fugitive emissions unless the source type is specifically listed in the rule. Under the definition of “major source”, one of the items listed is subparagraph xxvii, which states “all other stationary source categories regulated by a standard promulgated under section 111 or 112 of the Act but only with respect to those air pollutants that have been regulated for that category.” In this case NSPS, subpart Db is applicable to the facility and it regulates total particulate matter, which includes PM₁₀, which is regulated under Title V. So in summary, fugitive PM₁₀ emissions were included, where quantifiable, in the facility total when determining the applicability of the Title V permit program for this facility.

The permit includes monitoring necessary to determine compliance with emission limits in the permit. A combination of CEM/COMs and performance testing applies to the main boilers along with parametric monitoring of the ESP. CEMs were required for NO_x and CO for a number of reasons. The NO_x control system is a new system with only a few short-term full-scale installations in the country. The CO emissions estimate was very low, as discussed above. The fuel source will be very inconsistent in heating value due to fluctuating source and moisture content. Some fuel could be bark, some could be sawdust, and some could be slash. The inconsistent fuel could make it challenging to stabilize boiler performance and hence produce consistent CO and NO_x emissions. In addition, optimizing boiler performance to reduce the

emissions of one of these two pollutants will, in general, increase the emissions of the other. All of these factors show that a one time performance test will not be very useful in determining the emissions of these two pollutants over an annual time period.

Since the standby boiler and emergency generator will be used sparingly once the facility is in full-scale operation, performance testing was not required for these units. Parametric monitoring of the particulate control equipment is included for the standby boiler, and fuel sulfur monitoring is included for the emergency generator.

3.2.1.3. New Source Performance Standards (NSPS)

The main boilers at the facility are subject to NSPS, subpart Db. These requirements have been included in the permit.

3.2.1.4. Title IV – Acid Rain Program

The facility is not subject to the federal acid rain program because it does not burn a fossil fuel as defined at 40 CFR § 72.2. Therefore, these boilers can not be affected units. A permit condition limiting the fuel used in the boilers to wood is included.

3.2.2. State Air Quality Rules

This permit is an individual state permit. By rule (see Minn. R. 7007.1050, subp. 2) this permit may be a non-expiring permit. Under this same rule, the MPCA also has the authority to make it an expiring permit. MPCA staff have elected to give this permit a term of five years in this case because the operation of the new NO_x control system and its associated uncertainties justify a future reexamination of the operations of the facility. It is possible that the facility will want to change NO_x control system in the future, which would result in a need to make changes to the permit.

Another reason for an expiring permit is to give the facility an opportunity justify removing the CEM requirement. After gathering five years of data, the facility would have to show that the emissions from the source are consistently well below the 100 ton per year thresholds. At this point the MPCA to consider removing the requirement. The COM requirement is required by NSPS and therefore can not be removed at some later date.

3.2.2.1. Environmental Review

As stated under section 3.1 of this document, the permit for the facility has limits that prevent it from exceeding the 100 ton per year threshold that would trigger the need for an Environmental Assessment Worksheet (EAW) under the mandatory air pollution category (subp. 15) of Minn. R. 4410.4300. There were other potential mandatory EAW categories that were examined for this project by other state agencies, but the facility was found not trigger any of these mandatory categories. Two letters discussing these requirements are included as Attachments 4 and 5.

3.2.2.2. Minnesota Standards for Stationary Sources (Minn. R. ch. 7011)

Since an NSPS is applicable to the main boilers, no standard in Minn. R. ch. 7011 applies to these units. Minn. R. 7011.0515 applies to the standby boiler, Minn. R. 7011.0715 applies to the ash bin vent, and Minn. R. 7011.2300 applies to the emergency generator. The boilers do not qualify as waste combusters under Minn. R. 7011.1201 because it is permitted burn only “wood”, as defined in the rule, and included in the permit. The state acid rain rules (Minn. R. ch.

7021) do not apply to this facility because the total combined net generating capacity is less than the threshold of 1,000 megawatts.

3.2.2.3. Ambient Air Quality Standards (Minn. R. ch. 7009) and Air Toxics

The proposed facility is located in an industrial park across the highway from a K-12 school. The close proximity of the school led MPCA staff to require IPC to conduct screening modeling to determine the impact of the emissions from IPC on the ambient air. Screening modeling was conducted using EPA's model Screen3. This model uses conservative assumptions in its algorithms so that the results it produces are also conservative. Stated another way, it can be assumed that any facility whose emissions do not cause an exceedance of the ambient standards using the model, will also safely not cause an exceedance of the ambient standards in real life. The modeling results are included as Attachment 6. Compliance was shown with the ambient standards (NAAQS) and emergency episode levels (EELs). No SO₂ modeling was done due to the low level of emissions. The stacks on the emergency generator and standby boiler had to be extended higher than originally proposed in the permit application to allow the emissions to be in compliance with the ambient standards. The modeling also led to the addition of a permit condition that requires that the standby boiler, emergency generator, and the main boilers not all be operated at the same time. This allowed their ambient impacts to not be added together.

The MPCA does not have ambient air quality standards for air toxics, so these pollutants were addressed using a different approach. MPCA staff compared the emissions of air toxics from the facility to a table of draft screening emission rates (SERs) recently developed jointly by the Department of Health and the MPCA. These emission rates are back-calculated from the relevant health benchmarks for each pollutant while also assuming very poor dispersion and other conservative assumptions at a generic facility. Therefore, actual emission rates that are below the SERs can be safely assumed to produce ambient concentrations of those pollutants under their respective health benchmarks. On the other hand, emission rates above the SERs should not be assumed to automatically produce ambient concentrations of those pollutants above their respective health benchmarks. Rather, they are an indicator that a more detailed evaluation is warranted, when possible.

Air toxics emission data for the facility was grouped together from sources for which data was available (the main boilers and the standby boiler). Then the emission rate of each pollutant was compared to its respective SER. It should be noted that, in general, the actual air toxic emission rates from the facility will be lower than those used to make the comparisons to the SERs. This is because the emission rates that were used to compare to the SERs came from tests on other wood-fired boilers that had only one stage of particulate control. IPC will have two stages of control, an electrostatic precipitator and a wet scrubber. The pollution control equipment proposed for the IPC facility will likely remove more pollutants and lower the emission rates below what was used in this analysis.

Using the SER screening process, the emissions from 13 pollutants were not "screened out," that is, they had emission rates higher than their respective SERs. Each of these pollutants was then modeled individually using the screening model SCREEN3 that was also used for the criteria pollutants. This model incorporates site-specific characteristics such as the actual stack height, building heights, stack gas temperatures, and stack diameters. The remaining 13 pollutants were all shown to be below their health benchmarks using the SCREEN3 model.

It is important to remember that the modeling assumptions inherent to the development of the SERs, and to a lesser degree SCREEN3, are very conservative. Therefore, the use of an even more robust modeling program, such as EPA's ISC3, would most likely predict that the ambient concentrations of air toxics from this facility are even lower than that shown by SCREEN3. All of the air modeling programs spoken of above are designed to make predictions that are greater than what would actually be measured. Some are more conservative than others because they require less site-specific information.

A more comprehensive examination of the health effects of air emissions entails an Air Toxics Review (ATR) which can take many months and cost a considerable amount of money to prepare. They also require significant MPCA resources. Given the conservative nature of the approach taken, the additional controls that are required by the proposed permit, the fact that the individual pollutants were "screened out," and the additional resources that would be required to perform an ATR, the MPCA made the judgment that further review of the facility's emissions was not warranted.

4. Conclusion

Based on the information provided by the Itasca Power Company, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 07100026-001 and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

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Attachment: 1) Emission Calculations
2) & 3) NOx and CO Emission Factor Plots
4) August 10, 2000 Memo from Tom Balcom to Beth Lockwood
5) August 11, 2000 Letter from Denise Leezer to Dean Sedgwick
6) Screening Modeling Results
7) Responses to Comments