

**AIR EMISSION PERMIT NO. 04500050- 001**  
**IS ISSUED TO**

**HEARTLAND ENERGY & RECYCLING, LLC**  
Energy Drive  
Preston, Fillmore County, MN 55965

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	March 2002

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

**Permit Type:** Part 70, Synthetic Minor PSD

**Construction Authorization Issuance Date:** August 6, 2003

**Operating Conditions Issuance Date:** January 6, 2004

**Expiration:** January 6, 2009

Title I Conditions do not expire.

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Ann M. Foss  
Major Facilities Section Manager  
Majors and Remediation Division

for Sheryl A. Corrigan  
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:**

Once constructed, the Heartland Energy and Recycling Plant will be a waste tire to energy facility. The primary emission source will be a fluidized bed boiler, designed specifically to burn tire chips. The boiler may also be fueled with propane.

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

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

**Subject Item:****Total Facility**

<b>What to do</b>	<b>Why to do it</b>
This source is subject to U.S. EPA's Acid Rain Program, codified at 40 CFR Part 72. Some of the Acid Rain Program's requirements are included in Tables A and B for MPCA tracking purposes. All other Acid Rain Program requirements are referenced in the appendices.	40 CFR 72
Operation and Maintenance Plan: Implement at the stationary source an operation and maintenance plan for all air pollution control equipment. At a minimum, the O & M plan shall identify all air pollution control equipment and shall include a preventative maintenance program for that equipment, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment to proper operation to meet applicable permit conditions, a description of the employee training program for proper operation and maintenance of the control equipment, and the records kept to demonstrate plan implementation. Retain a copy of the plan at the stationary source.	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
Performance Test Notifications and Submittals:  Performance Tests are due as outlined in Tables A and B of the permit. See Table B for additional testing requirements.  Performance Test Notification (written): due at least 30 days before each Performance Test Performance Test Plan: due at least 30 days before each Performance Test Performance Test Pre-test Meeting: due at least 7 days before each Performance Test Performance Test Report: due within 45 days after each Performance Test Performance Test Report - Microfiche Copy: due within 105 days after each Performance Test	Minn. R. 7017.2030, subp. 1-4 and Minn. R. 7017.2035, subp. 1-2
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) and 4(B)
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

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

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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
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
Fugitive Emissions Control Plan: The Permittee shall submit a fugitive emissions control plan within 60 days of the date of permit issuance for review and approval by the Commissioner. The plan shall identify all fugitive emission sources, primary and contingent control measures, and record keeping. The Permittee shall follow the actions and record keeping specified in the control plan. The plan may be amended by the Permittee with the Commissioner's approval. If the Commissioner determines the permittee is out of compliance with Minn. R. 7011.0150 or the fugitive emission control plan, then the permittee may be required to amend the control plan and/or to install and operate particulate matter ambient monitors.	Minn. Stat. Section 116.07, subd. 4a; Minn. R. 7007.0800, subp. 2
Comply with Fugitive Emission Control Plan: The Permittee shall follow the actions and record keeping specified in the control plan. The plan may be amended by the Permittee with the Commissioner's approval. If the Commissioner determines the Permittee is out of compliance with Minn. R. 7011.0150 or the fugitive control plan, then the Permittee may be required to amend the control plan and/or to install and operate particulate matter ambient monitors as requested by the Commissioner.	Minn. Stat. Section 116.07, subd. 4a; Minn. R. 7007.0800, subp. 2
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)

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

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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
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 within 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
Emission Fees: due within 60 days after receipt of an MPCA bill.	Minn. R. 7002.0065
Parameters Used in Modeling: The parameters used in the modeling performed for an Environmental Assessment Worksheet under Minn. R. ch. 4410 and for determining emission and/or operational limits for this facility are listed in Appendix I of this permit. If the Permittee intends to change any of these parameters, the Permittee must submit the revised parameters to the Commissioner and receive written approval before making any changes. The revised parameter information submittal must include, but is not limited to: the locations, heights and diameters of the stacks; locations and dimensions of nearby buildings; velocity and temperatures of the gases emitted; and the emission rates. The plume dispersion characteristics due to the parameter revisions must equal or exceed the dispersion characteristics modeled for this permit, and the Permittee shall demonstrate this in the proposal.	Minn. R. 7009.0020 and Minn. R. 7007.0800, subp. 2
continued from above:  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.  For changes that do not involve an increase in an emission rate and that do not require a permit amendment, the proposal must be submitted as soon as practicable, but no less than 60 days before making the change to any parameter.	Minn. R. 7009.0020 and Minn. R. 7007.0800, subp. 2
continued from above:  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 making the change to any parameter.  For changes involving increases in emission rates and that require a permit amendment other than a minor amendment, the proposal must be submitted prior to or with the permit amendment application.  This is a state only requirement and is not enforceable by the EPA Administrator and citizens under the Clean Air Act.	Minn. R. 7009.0020 and Minn. R. 7007.0800, subp. 2
EMERGENCY PREPAREDNESS AND CONTINGENCY PLANS	hdr
Required equipment. The owner or operator must equip the facility with the following: a communications device, such as a telephone or a hand-held two-way radio, which is immediately available and is capable of summoning emergency assistance from local police departments or fire departments.	Minn. R. 7007.0800, subp. 2
Testing and maintenance of equipment. All communication and fire control equipment must be tested at least annually and maintained to ensure proper operation in time of emergency.	Minn. R. 7007.0800, subp. 2
Arrangements with local authorities for emergencies. The owner or operator of the facility must make prior arrangements with local police and fire departments for services that may be needed at the facility.	Minn. R. 7007.0800, subp. 2
Procedural manual. The owner or operator of the facility must prepare and maintain at the facility a procedural manual for facility personnel to use in time of emergency. The manual must contain: A. a list of names and telephone numbers of local fire and police departments; B. a list of the equipment available at the site such as fire extinguishers, communication and alarm systems, earthmoving equipment, and a brief description as to when and how the equipment is to be used; C. a description of the procedures to be followed from discovery until the situation is corrected or the contingency action plan is activated, including a facility coordinator, notification procedures to local authorities and the agency, control measures, and cleanup; and D. a description of prior arrangements made with local police and fire departments.	Minn. R. 7007.0800, subp.2

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

Contingency plan general requirements. The owner must prepare and maintain a contingency action plan at the facility. The contingency action plan must identify occurrences that would endanger human health and the environment and must establish procedures that would minimize hazards to human health and the environment. The plan shall be submitted to the Commissioner for approval. The boiler shall not be operated until the Commissioner has approved the contingency action plan.	Minn. R. 7007.0800, subp. 2
Implementation of plan. Within the period specified in the approved contingency action plan, the owner or operator must implement the provisions of the plan that would minimize the adverse effects to human health or the environment from vandalism, fires, explosions, failure or collapse of artificial or natural dikes, or liners, water quality violations, surface drainage problems, air emission violations, and other releases.	Minn. R. 7007.0800, subp. 2
Content of contingency action plan. The contingency action plan must contain the following: A. an identification of the possible events that may require corrective actions such as violations of air emission limits, failure of design features, B. a description of the actions, the sequence and the timetable in which they will be taken, and the costs associated with each corrective action; C. the equipment needed to repair each condition and the on-site and off-site availability of the equipment; D. any prior arrangements with contractors; E. scheduled and unscheduled down times for maintenance at the facility; and F. an estimated cost for each action, for the most severe action that may be needed, and all actions.	Minn. R. 7007.0800, subp. 2
Amendment of contingency action plan. The owner or operator must review and amend the contingency action plan whenever: A. a failure or release occurs for which the plan did not provide an appropriate response; or B. the design, construction, operation, or maintenance of the facility changes so that the response needed to a failure or release changes.	Minn. R. 7007.0800, subp. 2
Copies of contingency action plan. A copy of the contingency action plan and revisions to the plan must be submitted to the commissioner within 180 days of permit issuance.	Minn. R. 7007.0800, subp. 2
ASH MANAGEMENT PLAN	hdr
Develop an ash management plan and submit it to the Commissioner for approval. The boiler shall not be operated until the Commissioner has approved the ash management plan.	Minn. R. 7007.0801, subp. 3.A.
With the ash management plan, include a schedule for the testing of the waste combustor ash.	Minn. R. 7007.0801, subp. 3.B.

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item:** GP 001 Baghouses**Associated Items:** CE 004 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 005 Fabric Filter - Low Temperature, i.e., T&lt;180 Degrees F

What to do	Why to do it
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
Pressure Drop: greater than or equal to 2 inches of water column and less than 10 inches of water column, unless a new range is set pursuant to Minn. R. 7017.2025, subp. 3, based on the values recorded during the most recent MPCA approved performance test where compliance was demonstrated. The Permittee shall record the pressure drop once every 24 hours when in operation.	Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21; to avoid classification as a major source under 40 CFR Section 70.2; Minn. R. 7007.0800, subp. 2 and 14
Recordkeeping of Pressure Drop. The Permittee shall record the pressure drop, the time and date of each pressure drop reading and whether or not the recorded pressure drop was within the range specified in this permit.	Title I Condition: Monitoring for Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21; to avoid classification as a major source under 40 CFR Section 70.2; Minn. R. 7007.0800, subp. 4 and 5
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
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 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
The Permittee shall operate and maintain the fabric filter at all times that any emission unit controlled by the fabric filter is in operation.	Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21; to avoid classification as a major source under 40 CFR Section 70.2; Minn. R. 7007.0800, subp. 2 and 14
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14



**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item: GP 002 Sulfur Dioxide, Carbon Dioxide, and Nitrogen Oxides Monitors****Associated Items:** MR 002 sulfur dioxide

MR 003 nitrogen oxides

MR 005 CO2

What to do	Why to do it
CEMS Certification Test: due in accordance with 40 CFR Section 75.4. Certify all CEMS required by the Acid Rain Program in accordance with 40 CFR pt. 75, Appendix A.	40 CFR Section 75.4(b); 40 CFR Section 60.13(b)
CEMS Certification Test Plan: due at least 45 days before CEMS Certification Test.	40 CFR Section 75.62; 40 CFR Section 75.20; 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 30 days after CEMS Certification Test.	40 CFR Section 75.63; Minn. R. 7017.1080, subp. 1, 2 & 4
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 shall operate, calibrate, and maintain each CEMS according to the QA/QC procedures in 40 CFR pt. 75, appendix B as amended.	40 CFR Section 75.21
Daily Calibration error (CE) Test: conduct daily CE testing on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, appendix B.	40 CFR pt. 75, Appendix B, section 2.1
Linearity and Leak Check Test (Acid Rain Program): due before end of each QA operating quarter following CEMS Certification Test. Conduct a quarterly linearity and leak check test on CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, Appendix B.	40 CFR pt. 75, Appendix B, section 2.2
Test Results Summary: due at least 30 days after end of each calendar quarter following Linearity and Leak Check Test if performed.	Minn. R. 7017.1180, subp. 4
CEMS Relative Accuracy Test Audit (RATA): due before end of each two QA operating quarters following CEMS Certification Test. Conduct a RATA on all CEMS required by the Acid Rain Program, in accordance with 40 CFR pt. 75, Appendix B. If the RATA results indicate a relative accuracy of 7.5% or less, the next RATA is not required for twelve months.	40 CFR pt. 75, Appendix B, section 2.3
Relative Accuracy Test Audit (RATA) Notification: due at least 30 days before CEMS Relative Accuracy Test Audit (RATA)).	Minn. R. 7017.1180, subp. 2
Relative Accuracy Test Audit (RATA) Results Summary: due within 30 days after end of each calendar 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; and 40 CFR Section 75.57
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 and 40 CFR 75.5
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**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item:** GP 003 Materials Handling Equipment**Associated Items:** CE 004 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 005 Fabric Filter - Low Temperature, i.e., T&lt;180 Degrees F

EU 003 Limestone Unloading Operation

EU 004 Lime Unloading Operations

EU 005 Fly Ash Conveyor Silo

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	Minn. R. 7011.0715, subp. 1(B)
CONTROL REQUIREMENTS	hdr
Vent emissions through fabric filters whenever the materials handling equipment is in use.	Minn. R. 7007.0800, subp. 2

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item:** GP 004 Emergency Generators**Associated Items:** EU 002 Engine Generator

EU 006 Engine Generator

What to do	Why to do it
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
Nitrogen Oxides: less than or equal to 34.1 lbs/hour	Title I Condition: to limit potential emissions to less than major source levels as defined by 40 CFR 52.21
Fuel use limited to distillate oil. Obtain and keep vendor certifications for each delivery.	Minn. R. 7007.0800, subp. 2
Operating Hours: less than or equal to 650 hours/year based on a 12 month rolling sum.	Title I Condition: to limit potential emissions to less than major source levels as defined by 40 CFR 52.21
Each month, by the 15th of the month, record the engine's hours of operation for the previous month, and calculate the total hours of operation for the previous 12 months. Record the results.	Title I Condition: monitoring for limit taken to restrict potential emissions to less than major source levels as defined by 40 CFR 52.21
Initial Performance Test: due 180 days after Initial Startup for NOx emissions.	Title I Condition: testing for limit to restrict potential emissions to less than major source levels as defined by 40 CFR 52.21

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item:** EU 001 Fluidized Bed Boiler**Associated Items:** CE 001 Ammonia Injection (SNCR)

CE 002 Dry Scrubber (lime)

CE 003 Fabric Filter - High Temperature, i.e., T&gt;250 Degrees F

MR 001 opacity

MR 002 sulfur dioxide

MR 003 nitrogen oxides

MR 004 CO

MR 005 CO2

SV 001 Fluidized Bed Boiler

What to do	Why to do it
<b>EMISSION LIMITS</b>	hdr
Total Particulate Matter: less than or equal to 0.042 lbs/million Btu heat input . The particulate matter limit applies at all times, except during periods of startup, shutdown or malfunction.	Title I Condition: To limit potential emissions to less than major source levels as defined by 40 CFR 52.21.
Particulate Matter < 10 micron: less than or equal to 0.042 lbs/million Btu heat input	Title I Condition: To limit potential emissions to less than major source levels as defined by 40 CFR 52.21
Sulfur Dioxide: less than or equal to 0.075 lbs/million Btu heat input based on a 30 day rolling average.	Title I Condition: To limit potential emissions to less than major source levels as defined by 40 CFR 52.21
Nitrogen Oxides: less than or equal to 0.14 lbs/million Btu heat input based on a 30 day rolling average.	Title I Condition: To limit potential emissions to less than major source levels as defined by 40 CFR 52.21
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.	40 CFR Section 64.3(a)(2)
The opacity standard applies at all times, except during periods of startup, shutdown and malfunction.	
Hydrochloric acid: less than or equal to 2.05 lbs/hour	Title I Condition: To limit potential emissions to less than major source levels as defined by 40 CFR 52.21
Carbon Monoxide: less than or equal to 0.075 lbs/million Btu heat input based on a 30-day rolling average.	Title I Condition: To limit potential emissions to less than major source levels as defined by 40 CFR 52.21
Carbon Monoxide: less than or equal to 0.090 lbs/million Btu heat input on a calendar day average.	Minn. R. 7007.0800, subp. 2
<b>OPERATING REQUIREMENTS</b>	hdr
Fuels limited to tire derived fuel and propane.	Minn. R. 7007.0800, subp. 2
<b>HEAT INPUT LIMITS</b>	hdr
Maximum heat input of the propane burners shall be less than 250 mmBtu/hour.	40 CFR 60, Subp. Db and to remain a minor source under 40 CFR 52.21
The boiler shall have an annual capacity factor for propane of 10% or less.	40 CFR 60.44b
<b>CONTROL REQUIREMENTS</b>	hdr
Emissions shall be vented to a spray dryer/fabric filter at all times that the boiler is in operation. See requirements under CE003 for additional conditions regarding baghouse operation and maintenance.	Title I Condition: to meet limit set to restrict potential emissions to less than major source levels
The SNCR system will operate whenever the boiler is operating, except during periods of boiler startup or SNCR system upset or malfunction. Regardless of startups, upsets or malfunctions, Heartland will be responsible for complying with the NOx 30-day rolling average emissions limit. If the SNCR is not fully operational within a 24-hour period, Heartland will be required to begin boiler shutdown procedures and will not be allowed to restart until the SNCR is fully operational.	Title I Condition: to meet limit set to restrict potential emissions to less than major source levels
<b>MONITORING REQUIREMENTS</b>	hdr
Install, calibrate, maintain, and operate a continuous monitoring system for measuring the opacity of emissions discharged to the atmosphere and record the output of the system. The monitoring system shall be capable of determining opacity in terms of percent, and capable of calculating 6-minute averages.	40 CFR 75.10, 40 CFR 64
Install, calibrate, maintain, and operate a continuous monitoring system for measuring the nitrogen oxides emissions discharged to the atmosphere and record the output of the system. The monitoring system shall be capable of determining emissions on a lb/mmBtu basis on a 30 day rolling average.	Title I Condition: to indicate compliance with the nitrogen oxides limitation taken to restrict potential emissions to less than major source levels; also 40 CFR 64.2 (b)(vi); 40 CFR 75.10

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

Install, calibrate, maintain, and operate a continuous monitoring system for measuring the sulfur dioxide emissions discharged to the atmosphere and record the output of the system. The monitoring system shall be capable of determining emissions on a lb/mmBtu basis, on a 30 day rolling average.	Title I Condition: to indicate compliance with the sulfur dioxide limitation taken to restrict potential emissions to less than major source levels; also 40 CFR 64.2(b)(vi); 40 CFR 75.10
Install, calibrate, maintain, and operate a continuous monitoring system for measuring the carbon monoxide emissions discharged to the atmosphere and record the output of the system. The monitoring system shall be capable of determining emissions on a lb/mmBtu basis on a 30 day rolling average and a daily average.	Title I Condition: to indicate compliance with the carbon monoxide limitation taken to restrict potential emissions to less than major source levels as defined by 40 CFR 52.21
All continuous emission monitors, and the continuous opacity monitor shall be installed, operational, and tested for certification no later than 90 days after the unit commences commercial operation. See Group 2, Continuous Emission Monitors, for additional requirements for maintenance and operation of the monitors.	40 CFR 75.4(b)(2)
Measure all SO <sub>2</sub> , NO <sub>x</sub> and CO <sub>2</sub> emissions in accordance with 40 CFR 75.10.	40 CFR 75.10
PERFORMANCE TESTING	hdr
Performance Test: due 180 days after Initial Startup for opacity and particulate matter. Test methodology is specified in 40 CFR 60.46b(d).	40 CFR 60.46b(d)
Performance Test: due 180 days after Initial Startup to measure the maximum heat input capacity of the steam generating unit by operating the facility at maximum capacity for 24 hours in accordance with 40 CFR 60.46b(g).	40 CFR 60.46b(g)
Performance Test: due 180 days after Initial Startup for HCl. The test shall be performed at three different spray dryer/fabric filter operating conditions to develop a correlation between SO <sub>2</sub> CEM output and actual HCl emissions.	Title I Condition: Testing to show compliance with limits taken to restrict potential emissions to less than major source levels as defined by 40 CFR pt. 63
The correlation is due with the stack test report to the Agency.	
Performance Test: due 180 days after Initial Startup to measure mercury emissions and pollution control equipment collection efficiency. This testing is for information gathering purposes. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. Stat. sec. 116.07, subd. 9 (b)
Metals and Dioxin Emissions Performance Test: Due 180 days after Initial Startup. Tests shall be conducted in compliance with the test procedures in Minn. R. ch. 7017. If measured emissions are significantly greater than those predicted by the emission factors used to develop the permit, the MPCA reserves its authority to require a more refined analysis from the company. Depending on the results of the more refined analysis, the MPCA reserves its authority to open the permit to include emissions limits for dioxins and/or metals. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. Stat. sec. 116.07, subd. 9 (b)
REPORTING AND RECORDKEEPING REQUIREMENTS	hdr
Notification of the Actual Date of Initial Startup: due 15 days after Initial Startup. The notification shall include: (1) The design heat input capacity of the affected facility and identification of the fuels to be combusted in the affected facility.	40 CFR 60.49b(a)
(continued from above) (2) not applicable (3) The annual capacity factor at which the owner or operator anticipates operating the facility based on all fuels fired and based on each individual fuel fired. (4) not applicable.	40 CFR 60.49b(a)
Submit the performance test data from the initial performance test for particulate matter and opacity, and the performance evaluation of the COMs using the applicable performance specifications in appendix B.	40 CFR 60.49b(b)
Submit the maximum heat input capacity data from the demonstration of the maximum heat input capacity of the affected facility.	40 CFR 60.49b(b)
Record and Maintain records of the amounts of each fuel combusted during each day and calculate the annual capacity factor for each fuel for the reporting period. The annual capacity factor for propane is to be calculated within 60 days of the end of the year.	40 CFR 60.49b(d)
Maintain records of opacity.	40 CFR 60.49b(f)
Submit excess emission reports for any excess opacity emissions which occurred during the reporting period. Excess emissions are defined as all 6-minute periods during which the average opacity exceeds the opacity standard.	40 CFR 60.49b(h)
Submit a report of the annual capacity factor over the previous 12 months.	40 CFR 60.49b(q)
Major Amendment: Submit a request for a major permit amendment along with the stack emissions test results for HCl. The testing is required above under the PERFORMANCE TESTING section. The purpose of the amendment to the permit will be to establish a specific SO <sub>2</sub> CEM reading range that will ensure compliance with HCl emissions.	40 CFR Section 64
CAM REQUIREMENTS	hdr

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

Proper maintenance: At all times, the owner or operator shall maintain the monitoring including, but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment.	40 CFR 64.7(b)
Continued operation: Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the owner or operator shall conduct all monitoring in continuous operation or shall collect data at all required intervals at all times that the pollutant-specific emissions unit is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of this part, including data averages and calculations, or fulfilling a minimum data availability requirement, if applicable. The owner or operator shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data.	40 CFR 64.7(c)
Response to excursions or exceedances: (1) Upon detecting an excursion or exceedance, the owner or operator shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown, or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Such actions may include initial inspection and evaluation, recording that operations returned to normal without operator action (such as through response by a computerized distribution control system) or any necessary follow-up actions to return operation to within the indicator range.	40 CFR 64.7(d)
Documentation of need for improved monitoring: After approval of monitoring under this part, if the owner or operator identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the owner or operator shall promptly notify the permitting authority and, if necessary, submit a proposed modification to the part 70 or 71 permit to address the necessary monitoring changes. Such a modification may include, but is not limited to, reestablishing indicator ranges or designated conditions, modifying the frequency of conducting monitoring and collecting data, or the monitoring of additional parameters.	40 CFR 64.7(e)
<b>RECORDKEEPING AND REPORTING REQUIREMENTS SPECIFIED BY CAM</b>	hdr
Submittal of reports of any required monitoring is required at least every 6 months. All instances of deviations from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official consistent with 70.5(d) of this part.  The semiannual deviations report in the total facility section of this permit satisfies this requirement.	40 CFR 64.9(a) and 40 CFR 70.6(a)(3)(iii)
Prompt reporting of deviations from permit requirements is required, including those attributable to upset conditions as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. The permitting authority shall define "prompt" in relation to the degree and type of deviation likely to occur and the applicable requirements.  The total facility requirements for notifications of deviations endangering human health satisfy this requirement.	continued from above
Semi-annual deviations reports shall also include:  i) Summary information on the number, duration and cause (including unknown cause, if applicable) of excursions or exceedances, as applicable and the corrective actions taken;  ii) Summary information on the number, duration and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable); and  iii) A description of the actions taken to implement a QIP during the reporting period as specified in 64.8. Upon completion of a QIP the owner or operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions or exceedances occurring.	continued from above

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

<p>General recordkeeping requirements. (1) The owner or operator shall comply with the recordkeeping requirements specified in 70.6(a)(3)(ii) of 40 CFR. The owner or operator shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 40 CFR 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained under this part (such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions).</p> <p>(2) Instead of paper records, the owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.</p>	40 CFR 74.9(b)(1) and (2)
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**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item:** CE 003 Fabric Filter - High Temperature, i.e., T>250 Degrees F**Associated Items:** EU 001 Fluidized Bed Boiler

What to do	Why to do it
Pressure Drop: greater than or equal to 2 inches of water column and less than 10 inches of water column , unless a new range is set pursuant to Minn. R. 7017.2025, subp. 3, based on the values recorded during the most recent MPCA approved performance test where compliance was demonstrated. The Permittee shall record the pressure drop once every 24 hours when in operation.	Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21; to avoid classification as a major source under 40 CFR Section 70.2; <Minn. R. 7007.0800, subp. 2 and 14>
Recordkeeping of Pressure Drop. The Permittee shall record the pressure drop continuously, and shall install an alarm system that notifies the operator when the pressure drop is out of range.	Title I Condition: Monitoring for Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21; to avoid classification as a major source under 40 CFR Section 70.2; Minn. R. 7007.0800, subp. 4 and 5
The Permittee shall operate and maintain the fabric filter at all times that any emission unit controlled by the fabric filter is in operation.	Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21; to avoid classification as a major source under 40 CFR Section 70.2; <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: - 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 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



**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item: TK 001 Diesel fuel**

<b>What to do</b>	<b>Why to do it</b>
Keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel.	40 CFR 60.116b(b)
Maintain records of the VOL stored, the period of storage, and the maximum true vapor pressure of that VOL during the respective storage period.	40 CFR 60.116b(c)
Notify the Administrator within 30 days when the maximum true vapor pressure of the liquid exceeds 15 kPa.	40 CFR 60.116b(d)
The tank shall be equipped with a submerged fill pipe.	Minn. R. 7011.1505, subp. 3(B)

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy & Recycling  
Permit Number: 04500050 - 001

**Subject Item:** FS 001 Fly Ash Loading to Trucks

What to do	Why to do it
A pneumatic delivery system will be used for flyash loading to trucks.	Minn. R. 7007.0800, subp. 2

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item:** MR 001 opacity**Associated Items:** EU 001 Fluidized Bed Boiler

What to do	Why to do it
Below are listed certain requirements for operation and maintenance of the continuous monitoring system. Additional requirements are specified in Minn. R. 7017.1002 through 7017.1220.	hdr
Installation Notification: due at least 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	Minn. R. 7017.1050, subp. 1; 40 CFR Section 60.8(a)
COMS Certification Test Plan: due at least 30 days before COMS Certification Test.	Minn. R. 7017.1060, subp. 1 & 2
COMS Certification Test Pretest Meeting: due at least 7 days before COMS Certification Test.	Minn. R. 7017.1060, subp. 3
COMS Certification Test Report: due within 45 days after COMS Certification Test.	Minn. R. 7017.1080, subp. 1, 2 & 4
COMS Certification Test Report - Microfiche Copy: due within 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 (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 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 within 30 days after end of each calendar half-year following COMS Calibration Error Audit.	Minn. R. 7017.1220
COMS Monitoring Data: Owners or operators of all COMS shall 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 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

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

**Subject Item: MR 004 CO****Associated Items:** EU 001 Fluidized Bed Boiler

What to do	Why to do it
Installation Notification: due at least 60 days before installing the continuous emissions monitoring system.	Minn. R. 7017.1040, subp. 1
CEM Certification Test: due 90 days after achieving maximum capacity. Follow the Performance Specifications listed in 40 CFR pt. 60, Appendix B.	Minn. R. 7017.1050, subp. 1
CEMS Certification Test Plan: due at least 30 days before CEMS Certification Test	Minn. R. 7017.1060, subp.1 & 2
CEMS Certification Test Pretest Meeting: due at least 7 days before CEMS Certification Test.	Minn. R. 7017.1060, subp. 3
CEMS Certification Test Report: due within 45 days after CEMS Certification Test	Minn. R. 7017.1080, subp. 1, 2, & 4
CEMS Certification Test Report - Microfiche Copy: due within 105 days after CEMS Certification Test	Minn. R. 7017.1080, subp. 3
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 at least 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
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
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. 7007.1130
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

## TABLE B: SUBMITTALS

03/04/04

Facility Name: Heartland Energy & Recycling  
Permit Number: 04500050 - 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**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 001

What to send	When to send	Portion of Facility Affected
Computer Dispersion Modeling Information	due 1,096 days after Permit Issuance. Submit modeling data as specified in MPCA guidance for Modeling Information Requests (for pollutant). This modeling information is for data collection purposes, no modeling analysis is required at this time. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Total Facility
Notification of the Date Construction Began	due 30 days after Start Of Construction	EU001
Testing Frequency Plan	due 60 days after Initial Performance Test for NOx 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.	GP004
Testing Frequency Plan	due 60 days after Initial Performance Test for PM, PM10 and mercury 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

**TABLE B: RECURRENT SUBMITTALS**

03/04/04

Facility Name: Heartland Energy &amp; Recycling

Permit Number: 04500050 - 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 (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.	MR004
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (Submit Deviations Reporting Form DRF-1 as amended). The EER must contain all of the information requested in 40 CFR60.7(c). The EER shall indicate all periods of monitor bypass and all periods of exceedances of the limit including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions.	GP002
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.	MR001
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 30 days after end of each calendar year following Permit Issuance (for the previous calendar year). To be submitted to the Commissioner on a form approved by the Commissioner. This report covers all deviations experienced during the calendar year.	Total Facility

## APPENDIX MATERIAL

Facility Name: Heartland Energy & Recycling

Permit Number: 04500050-001

### Insignificant Activities Required to be Listed

Sand storage tank

Onsite traffic (paved roads)



# Phase II Permit Application

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

This submission is

X

New

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Heartland Energy and Recycling Plant Name	Minnesota State	55865 ORIS Code
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# Compliance Plan

[illegible]

## Standard Requirements

### Permit Requirements.

- (1) The designated representative of each affected source and each affected unit at the source shall:
  - (i) Submit a complete Acid Rain permit application (including a compliance plan) under 40 CFR part 72 in accordance with the deadlines specified in 40 CFR 72.30; and
  - (ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain permit application and issue or deny an Acid Rain permit;
- (2) The owners and operators of each affected source and each affected unit at the source shall:
  - (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and
  - (ii) Have an Acid Rain Permit.

### Monitoring Requirements.

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

### Sulfur Dioxide Requirements.

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

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

### Excess Emissions Requirements.

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

### Recordkeeping and Reporting Requirements.

- (1) Unless otherwise provided, the owners and operators of the source and each affected unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:

- (i) The certificate of representation for the designated representative for the source and each affected unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
  - (ii) All emissions monitoring information, in accordance with 40 CFR part 75;
  - (iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,
  - (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.
- (2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

#### Liability.

- (1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain permit application, an Acid Rain permit, or a written exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
- (2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
- (3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
- (4) Each affected source and each affected unit shall meet the requirements of the Acid Rain Program.
- (5) Any provision of the Acid Rain Program that applies to an affected source (including a provision applicable to the designated representative of an affected source) shall also apply to the owners and operators of such source and of the affected units at the source.
- (6) Any provision of the Acid Rain Program that applies to an affected unit (including a provision applicable to the designated representative of an affected unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans) and 40 CFR 76.11 (NO<sub>x</sub> averaging plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one affected unit shall not be liable for any violation by any other affected unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.
- (7) Each violation of a provision of 40 CFR parts 72, 73, 74, 75, 76, 77, and 78 by an affected source or affected unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

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

- (1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an affected source or affected unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;
- (2) Limiting the number of allowances a unit can hold; provided, that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;
- (3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;
- (4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,
- (5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

***Dispersion Modeling Parameters:***

Boiler 1:

Stack height: equal to or greater than 60.9 m

Stack diameter: less than or equal to 1.47 m

Engine Generators:

Stack height: equal to or greater than 25.9 m

Stack diameter: less than or equal to 0.5749 m

**TECHNICAL SUPPORT DOCUMENT**  
**For**  
**DRAFT AIR EMISSION PERMIT NO 04500050-001**

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/Operator Address	Facility Address (SIC Code: 4961)
Robert Maust Heartland Energy and Recycling 800 Oak Drive Preston, MN 55965	Heartland Energy and Recycling Energy Drive Preston, MN 55965

1.2. Description Of The Facility

The Heartland Energy and Recycling facility will use Tire-Derived Fuel (TDF) and waste tire wire to produce steam and electricity from a fluidized bed boiler. The fluidized bed boiler has a sand bed which is heated with propane before the TDF is introduced into the boiler. Control equipment will consist of a spray dryer/fabric filter for particulate and acid gas control, and selective non-catalytic reduction (SNCR) for nitrogen oxides control. Spray dryer/fabric filters are capable of controlling particulate and acid gas emissions at levels as high as 98% or more. SNCR systems reduce NO<sub>x</sub> emissions from 30-70%.

The facility will receive whole tires that will then be shredded with equipment housed inside a building. Those shredded pieces of tire are the TDF. Other emission sources include two diesel engine generators, materials handling equipment, and a fuel oil storage tank.

The electricity generated will be sold to the electrical grid. Heartland will also sell recovered steel from the waste tire wire material.

## 1.4. Facility Emissions:

Table 2. \*Total Facility Limited Potential to Emit Summary:

	PM tpy	PM <sub>10</sub> tpy	SO <sub>2</sub> tpy	NO <sub>x</sub> tpy	CO tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAPs tpy
Total Facility Limited Potential Emissions	70.8	70.8	115	245	122	25.6	-	9.0	9.43

Table 3. Permit Action Classification

Classification (put x in appropriate box)	Major/Affected Source	*Synthetic Minor	*Minor
PSD (list pollutant)		NO <sub>x</sub> , PM, PM <sub>10</sub> , SO <sub>2</sub> ,	CO, VOC
NAAR (list pollutant) NA			
Part 70 Permit Program (list pollutant)		NO <sub>x</sub> , PM <sub>10</sub> , SO <sub>2</sub>	VOC, HAPs CO

\* 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 Units Affected by the Modification**

Table 4. Regulatory Overview

EU, GRP, or SV #	Applicable Regulations	Comments
EU001, Boiler	40 CFR pt. 60, Subp. Db	Federal New Source Performance Standards for Steam Generating Units
	40 CFR § 52.21	Emission limits set to prevent potential emissions from exceeding major source threshold levels
	40 CFR pt. 63, Subp. B	Limits on HCl to restrict potential emissions to less than major source threshold levels
	40 CFR pt. 72	Acid Rain Program
	Minn. R. 7007.0801	Conditions for Air Emission Permits For Waste Combustors
TK001	40 CFR 60, Subp. Kb Minn. R. 7011.1505	Standards of Performance for Storage Vessels
FC	Minn. R. 7011.0150	Preventing Fugitive Emissions from Becoming Airborne
GP004 Engines	Minn. R. 7011.2300	Standards for Internal Combustion Engines
	40 CFR § 52.21	Restrictions set on operating hours to prevent potential emissions from exceeding major source threshold levels

### 3. Technical and Regulatory Information

Federal New Source Review: The permit contains limits on fuel use that restrict annual emissions of Particulate Matter (PM), Particulate Matter less than 10 um in size (PM<sub>10</sub>), Nitrogen Oxides (NO<sub>x</sub>), and Sulfur Dioxide (SO<sub>2</sub>) to less than 250 tons per year. The emissions potential of other pollutants are also less than 250 tons per year, but require no federally enforceable limit to remain such.

If the proposed source qualified as one of the “listed source categories” under 40 CFR § 52.21, it would then be considered major for New Source Review (NSR) purposes if its potential emissions were in excess of 100 tons per year.

One of the listed source categories is “fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input.”

Permitted fuels for this boiler are TDF and also propane. The boiler will contain two burners of 50 mmBtu per hour capacity for warming the sand bed when the boiler is started. The burners are fueled by propane. Once the bed sand is heated to 1600 degrees Fahrenheit, the tire derived fuel can be introduced, and the burners shut off. Heartland Energy estimates that it will shut down and startup approximately five times per year.

The MPCA staff determined that tire derived fuel is not considered fossil fuel under the relevant regulations and, therefore, this boiler is not a listed source with a 100 ton per year regulated emissions threshold for NSR applicability purposes. A definition for “fossil fuel” is not contained in 40 CFR § 52.21. It is customary to consult the general definitions section at 40 CFR pt. 60 when 40 CFR § 52.21 does not provide a definition specific to the NSR program

40 CFR pt. 60 defines “fossil fuel” as “natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat.” The MPCA staff believes that the intention of the regulation was to include the various forms of natural gas, petroleum and coal, such as coal gas, but not to include all materials that may contain petroleum products.

On February 25, 2003, Don Smith, MPCA, spoke with Minnesota’s contact at U.S. Environmental Protection Agency (EPA) Region V, Ms. Rachel Rineheart. Ms. Rineheart was unaware of any guidance to the contrary. In addition, MPCA staff performed a guidance memo search on EPA’s web site. Many guidance memos regarding tire derived fuel were found, but all dealt with the issue of whether or not the material could be considered municipal solid waste, and thus qualify for an exemption from the Prevention of Significant Deterioration (PSD) rules. No guidance memos were found that stated that tire derived fuel should be treated as a fossil fuel under the regulations.

During the comment period for the permit, staff again asked EPA staff for a determination as to whether or not tires would be considered fossil fuel. EPA staff contacted the Office of Air Quality Planning and Standards (OAQPS) for verification of its determination that tires were not fossil fuel. On May 28 EPA staff indicated via telephone that OAQPS had agreed with its



determination, and that a formal determination in writing would be forthcoming. Staff was recently notified that a letter had been issued to the city of Preston stating that the proposed source was not considered one of the listed source categories.

Federal New Source Performance Standards: The fluidized bed boiler is subject to 40 CFR pt. 60, Subp. Db. The tank is subject to 40 CFR pt. 60, Subp. Kb.

Minnesota Performance Standards: There will be two diesel engine generators on site. The engines are subject to performance standards for internal combustion engines that set limits on sulfur and opacity emissions, Minn. R. 7011.2300.

The facility is subject to Minn. R. 7011.0150, Preventing Fugitive Emissions from Becoming Airborne, and the tank is subject to Minn. R. 7011.1505.

Staff reviewed whether the facility would be subject to Minnesota's Waste Combustor Rules. The MPCA has determined that the boiler is not subject to those standards because Minn. R. 7011.1215, subp. 2a specifically exempts facilities burning tires from the waste combustor rules. Heartland will be permitted to burn only tires and propane in the fluidized bed boiler. The facility is, however, subject to Minn. R. 7007.0800, subp. 3, Conditions for Air Emission Permits For Waste Combustors. Those regulations require an ash management plan and testing of the ash. Items A. and B. are applicable. Items C. through F. reference parts of the waste combustor regulation that tire derived fuel plants are specifically exempt from.

Environmental Review: An Environmental Assessment Worksheet (EAW) is mandatory if potential emissions from a project are greater than 100 tons of any air pollutant. As permitted, Heartland's potential emissions will exceed 100 tons per year, and so an EAW was prepared for the facility. The EAW was publicly noticed on September 2, 2002.

After the close of the public comment period, the EAW was considered at the MPCA Citizens' Board Meeting in February 2003. At that meeting, the MPCA Citizens' Board determined that the project as proposed would not have a significant environmental impact and further study through an Environmental Impact Statement was not warranted. The significance of Heartland's environmental impact was analyzed during the EAW process and will not be re-analyzed in this permitting action.

NESHAPs: The facility has limited potential HAP emissions of less than 10 tons per year of a single HAP, and less than 25 tons total HAPs. It is, therefore, not considered a major source of hazardous air pollutants. The permit contains limits on hydrogen chloride (HCl) emissions because proper operation of the control equipment may be needed to limit those emissions to less than 10 tons per year. Uncontrolled emissions of HCl would be approximately 80 tons per year.

It should be noted that measured HCl emissions from the pilot plant would indicate that potential HCl emissions from the Heartland plant would be approximately ½ ton per year. However, emission factors for coal, if used, (coal contains a similar chlorine content), would produce potential emissions over 10 tons per year. Not much HCl emissions data was available from other tire derived fuel plants. So, in the absence of more data to the contrary, MPCA staff assumed that HCl emissions might indeed exceed 10 tons per year, and have accordingly set emission limits in the permit to insure the facility is a minor source for HCl.

Staff did obtain data from a dedicated tires-to-energy plant in Exeter, Connecticut. The Exeter plant is similar in size to the proposed Heartland Facility. With the tested emission factor for HCl, and assuming full capacity operation, potential emissions from Exeter would be less than three

tons per year, and staff believes that the HCl emissions from the Exeter facility support Heartland's assertion that it can meet and maintain compliance with the emission limits it has accepted.

Title IV, Acid Rain Program: The facility is subject to the Acid Rain Program codified at 40 CFR pt. 72. The acid rain program requires utilities to obtain credits for each ton of sulfur dioxide emitted, and to monitor emissions for nitrogen oxides, carbon monoxide, sulfur dioxide, and opacity.

Compliance Demonstration: Continuous emission monitoring is required for opacity, sulfur dioxide emissions, nitrogen oxide emissions and carbon monoxide emissions. Compliance with particulate and PM<sub>10</sub> emissions will be demonstrated through stack emissions testing. The smaller materials handling equipment will demonstrate compliance with emission limits by installing, maintaining, operating and monitoring the pressure drop across the fabric filters on the sources. Compliance with the HCl limit will be measured by correlating the sulfur dioxide continuous emission monitoring (CEM) readings to the actual HCl emission rate as determined through stack testing.

CAM Applicability: 40 CFR pt. 64, Compliance Assurance Monitoring (CAM) addresses emission sources having major emissions of regulated air pollutants under Title V. The CAM rule requires subject facilities to prepare, submit, and implement a plan for monitoring CAM – applicable emissions of regulated pollutants for compliance with emission limits. A separate monitoring plan must be submitted for each CAM-applicable pollutant emitted by a source. To be CAM applicable, the potential emissions, without control, must be equal to or greater than the major source threshold for that pollutant; 100 tpy for criteria pollutants, 10 and 25 tpy for HAPs.

The Heartland Boiler will have uncontrolled potential emissions of greater than 100 tons per year of several pollutants, and greater than 10 tons per year of a single HAP. The pollutants are PM, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, Carbon Monoxide (CO), and HCl.

The CAM regulations recognize that CEMs are the most accurate way of determining continuous compliance with emission limits, and do not require the submittal of a CAM plan for those pollutants that will be monitored by CEMs. (See 40 CFR § 64.2 (b) Exemptions.) The Heartland boiler will have CEMs for SO<sub>2</sub>, NO<sub>x</sub>, CO, and will have an opacity monitor. Accordingly for those pollutants, a CAM plan is not required.

For PM and PM<sub>10</sub> emissions, Heartland will monitor for compliance using the opacity monitor, combined with continuous measurement of baghouse pressure drop. The permit also contains requirements for baghouse and monitoring equipment inspection and maintenance and for periodic stack emissions testing. The MPCA staff believes that this is consistent with EPA's guidance on the development of CAM plans.

For monitoring of HCl emissions, Heartland will be using the SO<sub>2</sub> CEM as a surrogate for compliance demonstration, along with stack emissions testing. The MPCA staff maintains that demonstration of continuous compliance with the SO<sub>2</sub> permit limit via the SO<sub>2</sub> CEMS is an adequate, singular CAM indicator for HCl and that this is justified based on both technical reasoning and on relevant EPA precedent.

It is generally accepted that lime scrubbing is more efficient at removing HCl than it is at removing SO<sub>2</sub>. Thus, if CEMs continuously demonstrate sufficient removal of SO<sub>2</sub>, it is reasonable to assume that adequate HCl removal is achieved as well. The New Source Performance Standards for municipal waste combustors promulgated in 1995 (a post 1990 standard that is presumed to have enhanced monitoring), require CEMs for SO<sub>2</sub>, but no additional monitoring indicators for HCl emissions. Also, EPA explained the reason for this in its response to public comments on the issue:

“The EPA’s current data indicate that HCl is preferentially removed and that high levels of SO<sub>2</sub> removal indicate high levels of HCl removal. Therefore, the SO<sub>2</sub> CEMS being required will provide an indication of HCl control...”

The permit has been drafted to require Heartland to perform initial compliance testing to develop a correlation curve between sulfur dioxide emission readings from the CEM and actual HCl emissions. HCl emissions can then be determined from the SO<sub>2</sub> CEM readings and the correlation curve.

#### Development of Emissions Factors

There is no existing TDF fired fluidized boiler from which to obtain emission factors. Thus, staff used other sources to determine expected emission rates.

TDF is being utilized in many utility boilers, industrial boilers, and cement plants. Because of the growing popularity of the fuel type, EPA completed a study on the air emissions from scrap tire combustion (EPA-600/R-97-115) published in 1997. In that report source test data from 22 industrial facilities were presented: 3 kilns (2 cement, 1 lime) and 19 boilers (utility, pulp and paper, and general industrial applications). EPA concluded that results from a dedicated tires-to-energy facility indicate that it is possible to have emissions that are not much different from emissions produced by existing solid-fuel-fired boilers when the boiler is properly designed and controlled. EPA specifically states, “With the exception of zinc emissions, potential emissions from TDF are not expected to be very much different from other conventional fossil fuels, as long as combustion occurs in a well-designed, well-operated, and well-maintained combustion device”. (EPA-600/R-97-115)

Below is a comparison of coal, wood and TDF by composition:

	<b>Coal</b>	<b>Wood</b>	<b>Poultry litter</b>	<b>TDF</b>
Carbon, %	73.92	49.7		83.87
Hydrogen, %	4.85	5.4		7.09
Oxygen, %	6.41	39.3		2.17
Nitrogen, %	1.76	0.2		0.24
Sulfur, %	1.59	0.1		1.23
Ash, %	6.23	5.3		4.78
Moisture, %	5.24			0.62
Heating value, Btu/lb	13,346	8340 (dry)		15,500
Cadmium, ppm	0.5			<5
Chromium, ppm	20			<5
Lead, ppm	40			51
Mercury, ppm	100	3.75*		9.53*
Zinc, ppm	50			2140

Total Halogens	1175			3100
Chlorine	1000	30-450 (f.)	7100** 4000-5800 (f.)	850****

Source: Jones, 1990; U.S. EPA-600/R-97-115 TDF report, 1997; Sloss, 1992, coal data

\*Mercury data for wood and TDF from WDNR testing at NSP Bayfront Plant in Ashland

\*\*Litter data from "Economic and Technical Feasibility of Energy Production from Poultry Litter and Nutrient Filter Biomass on the Lower Delmarva Peninsula," August 2, 1999.

\*\*\*\*BFI, Scrap Tire Collection and Recycling Services

Wood data for oak bark from Table 17, 8-18, Steam, It's Generation and Use

As can be seen, TDF is a high heating value material. Both the carbon content and the hydrogen content are higher than coal. Nitrogen content is lower, and as one would expect, most facilities see a reduction in NO<sub>x</sub> emissions when adding TDF to coal combustion.

The MPCA staff quantified and compared the HAP emissions from coal, wood, and TDF combustion at an existing Modesto TDF plant, and the projected potential emissions from the Heartland plant (attached). The projected emissions from the Heartland plant were developed using emissions data obtained from a 9 square foot pilot fluidized bed boiler controlled by baghouse. The Heartland plant will have a spray dryer in addition to a baghouse so one would expect emissions to be lower than projected. Dioxins and Furans were not detected at the pilot plant, so staff have used ½ the detection limit to calculate potential emissions of those pollutants.

The attachment shows that HAP emissions are generally the same or lower with TDF as with the other two fuels.

Most test data in EPA's report is from plants that burn coal and that tested at different levels of TDF addition; often 0 percent, 5 percent, 10 percent and 20 percent. Although results varied from plant to plant, with the addition of TDF, particulate generally decreased, SO<sub>2</sub> varied dependent upon the type of coal it was replacing, NO<sub>x</sub> was generally reduced, and chloride levels remained about the same. Carbon monoxide emissions tended to increase.

The cement kilns generally burn whole tires, as does the Modesto Power plant in California. Thus, the combustion technologies tested so far tend to be less efficient than the proposed Heartland boiler. The Heartland boiler will burn TFD sized 2 inches by 2 inches in a fluidized bed boiler. Metering small chunks of fuel into a boiler results in a controllable energy release, and more consistent even temperatures than when whole tires are burned. Consistent even temperatures minimize products of incomplete combustion (particulates, Volatile Organic Compounds (VOCs), and CO). Regarding the fluidized bed design, it is designed to optimize the three design features that control combustion optimization: time; temperature; and turbulence. Fluidized bed furnaces are designed with long residence time. Flue gas velocities are very low in the furnace, providing lots of time to completely oxidize the fuel.

Compared to grate boiler technology (like the Modesto boiler, and which uses water-cooled furnace walls), the Energy Products of Idaho (EPI) fluidized bed furnace uses an insulated refractor design for better maintenance of proper temperatures. Insulated refractor stores heat and reflects it back into the center of the furnace. This feature also promotes complete oxidation of the fuel. EPI fluidized bed boilers produce less CO and VOCs than other technologies.

Finally, turbulence is the last key to complete combustion. The fluidized bed is an extremely chaotic environment with rapid mixing of fuel and sand. Due to the lateral mixing of the bed, it is uncommon to see bed temperatures vary by more than 20 degrees Fahrenheit (F). Grate boilers may vary by more than several hundred degrees. This even temperature distribution is the result of the bed turbulence, and results in the most even combustion, as is evidenced by the discussion of differences in CO emissions above.

EPI has submitted test data which indicates that CO emissions from some of its other installations (fluidized beds burning various fuel types), produce CO emissions that are often one (1/10<sup>th</sup>) the CO emissions expected from stoker technologies burning coal or wood and sometimes as low as three orders (1/1000<sup>th</sup>) of magnitude lower. EPA has also completed a study of emissions from a coal fired fluidized bed boiler (TNP Unit 2), that shows that emissions are 1/10<sup>th</sup> that expected from a coal fired stoker boiler. These are all fluidized beds that are burning fuels other than tires, but provide evidence that the emission factors developed for tires in combustion systems other than fluidized beds should be overestimates of the emissions of HAPs and CO that will be emitted from the proposed boiler.

Even though staff expect emissions from this boiler to be less than emissions from the existing TDF plants, the draft permit requires Heartland to install the best available control technology; a spray dryer/fabric filter for SO<sub>2</sub> and particulate control, lime bed injection for further SO<sub>2</sub> control, and selective non-catalytic reduction for NO<sub>x</sub> control. These control technologies also minimize HAP emissions.

So, while it is true that none of the tested facilities burned tires in a fluidized bed, one would expect that emissions in a fluidized bed would be less than that from most, or all, of the other tire derived fuel facilities tested, and that staff has reviewed.

## Mercury

Projected emissions of mercury are 17-20 lb/year using the one pilot test. Projected emissions of mercury using mass balance and EPA's extensive ICR data (discussed below) predicts uncontrolled emissions of 11.7 lb/year. These numbers, however, assume that there will not be control provided for by the spray dryer and, or SD/FF. Projected emissions using test data from an existing TDF plant (Modesto) controlled by a spray dryer/fabric filter are 2.06 lb/year. As discussed below, MPCA staff believes that scaling the emissions from the Modesto plant provides the most accurate method for estimating *post-pollution control equipment* emissions of mercury from the Heartland plant.

Data Source	Projected Emissions (lb/yr)
Modesto Plant, SD/FF	2.06
Pilot Plant, FF	19
Mass balance from EPA data, no control	11.7
Mass balance from EPA data, 90% control	1.17

The EPA has gathered extensive data related to mercury emissions from utilities through its Information Collection Request (ICR). The ICR required all coal-fired utility units to analyze coal mercury content for calendar year 1999 and required 85 coal-fired utility units to test for mercury emissions before and after the last control device. Testing of TDF for mercury content was also performed as part of this extensive data collection. EPA's numbers are based on many analyses, and staff believes are the most accurate for tire mercury content. Using those to predict

*pre-pollution control equipment* mercury emissions would then, also be the most accurate emissions estimation method.

*Mercury capture efficiency of control equipment:* Testing data collected by EPA showed that the best capture for mercury was obtained from dry and wet FGD scrubbers. The study also showed that NO<sub>x</sub> controls may also enhance the ability to capture mercury. 38 of the units tested were fitted with SNCR as is proposed at Heartland. While burning bituminous coals, facilities with SDA/FF averaged 98 percent mercury control. Control while burning subbituminous and lignite was much less, 24 and 0 percent respectively. Speciation of the mercury emissions varies with each coal, as does fly ash carbon and chlorine content, all of which are thought to affect the effectiveness of the control equipment. Fuels with higher chlorine contents (such as coal and tires) tend to produce oxidized mercury that is easily collectible in control equipment.

In an attempt to predict whether or not Heartland will see high control efficiencies from its plant, staff used the emission factor from testing done at the Modesto plant. As discussed above, using Modesto's emission rate shows that annual potential emissions from Heartland would be about two pounds per year. If the mercury content of the tires burned during the test was equivalent at both plants, then, the Modesto scrubber must be providing about 80 – 90 percent control, similar to the control seen while burning bituminous coals.

As a result, MPCA staff believes that mercury emissions from the Heartland plant will be in the oxidized form primarily, that high control efficiencies will be realized by the Heartland plant control equipment, and that likely mercury emissions will be two pounds or less per year.

*Comparison of mercury emissions with other power generation sources:* For persistent pollutants (metals, dioxins), many would agree that there is not an acceptable level of emissions. Nevertheless, power is still produced through combustion of some material necessitating some emissions of these pollutants. Therefore, staff prepared a comparison to the emissions from other power boilers as part of its evaluation.

In the year 2000, 3750 lbs of mercury were emitted as reported by the MPCA in its appendix to the air toxics report to the legislature. 1800 lbs of that mercury were generated from power combustion.

The report also gives mercury emissions, in lbs. from many of the generating plants. Some are tabulated below:

Facility	Fuel Type	'99 Hg Emissions, lbs.	'99 Hg in mg/MWh
Boswell Unit 1	coal	8	9
Boswell Unit 2	coal	9	9
Boswell Unit 3	coal	113	23
Boswell Unit 4	coal	178	26
Laskin Unit 1 and 2	coal	19	15



AS King	coal, gas, wood	35.7	5
Black Dog 3 and 4	coal	45.1	14
High Bridge 5	coal, gas	15.7	14
High Bridge 6	coal, gas	22.9	13
Red Wing 1	RDF, wood	160	1050
Red Wing 2	RDF, wood	135	1030
Riverside 6 and 7	coal	35	20
Riverside 8	coal	45	13
Sherco 1	coal	117.5	13
Sherco 2	coal	146.2	13
Wilmarth 1	RDF, gas	6.7	43
Hoot Lake Unit 2	coal	17.2	25
Hoot Lake Unit 3	coal	19.9	25
Sherco 3	coal, oil	100.5	10
<b><i>Heartland potential:</i></b>			
Heartland estimate using pilot plant factor	TDF	19	49
Heartland estimate using Modesto factor	TDF	2.06	5.3

\*Source for coal plant data: Table 1, MPCA Appendix G, Air Toxics Report 2/16/01

The emissions projected from the Heartland plant would show a relatively high mg/MWhr if no control is provided by the SD/FF. Using the Modesto emission factor predicts both low annual emissions and a low mg/MWhr.

The MPCA staff believes that actual mercury emissions from the proposed plant will be low, around two or three pounds per year.

#### Dioxins

Dioxins and Furans were not detected in the testing at the pilot plant, so staff used ½ of the detection limit as an estimate of emissions. Using ½ of the detection limits yields the following:

Plant	Emission Rate, lb/mmBtu	lb/year
Heartland	3.17E-11	9.74E-5
Modesto test data	9.2E-11	2.83E-4
Similar wood fired plant	1.32E-9	4.05E-3
Similar coal fired plant	2.44E-7	0.75

As can be seen, the TDF plant will not likely be a major source of dioxins. Dioxins were included in the environmental analysis that was done at ½ the detection limit (as is a standard practice.) The results of that analysis are discussed above under the Environmental Review section of this technical support document.

***Changes Made To The Permit After Public Notice:***

The following changes were made to the permit following the public notice period:

1. Required use of SNCR: The EPA suggested that in addition to the requirement to operate continuous emission monitors for NO<sub>x</sub>, that the permit also require continuous operation of the SNCR system. The permit was modified to say: "The SNCR system will operate whenever the boiler is operating, except during periods of boiler startup or SNCR system upset or malfunction. Regardless of startups, upsets or malfunctions, Heartland will be responsible for complying with the NO<sub>x</sub> 30-day rolling average emissions limit. If the SNCR is not fully operational within a 24-hour period, Heartland will be required to begin boiler shutdown procedures and will not be allowed to restart until the SNCR is fully operational."
2. Requirement for SO<sub>2</sub>/HCl correlation testing results and permit requirements: The permit, as noticed specified that Heartland was to determine a correlation between SO<sub>2</sub> emissions, which can be measured continuously, and HCl emissions, which cannot. The EPA requested that the permit state more clearly, that once established, the correlation and corresponding acceptable SO<sub>2</sub> emission rate operating range will be specified in the permit. A condition has been included in the permit that requires Heartland to apply for a major permit amendment when it submits its stack emissions testing/correlation that requests the operating range to be specified in the permit.
4. The permit now requires Heartland to conduct initial stack testing for dioxins and metals. The test results will be used to determine whether Heartland's emissions of dioxins and metals are within expected ranges. If not, the MPCA has reserved its authority to seek further information and/or open the permit to include emission limits for these pollutants.
5. Stack parameters have been added to the appendix, and a requirement set in Table A, under the Total Facility Requirements part that requires Heartland to receive written approval from the Agency should it choose any of the stack parameters relied on in the dispersion modeling and analysis performed for the EAW.
6. Initially, the opacity limit set in the permit referenced a portion of the federal new source performance standards that sets standards of performance for steam generating units. The limit was 20%. Since Heartland has determined that it will not burn wood, the basis for the citation is no longer the new source performance standard, it sets no limits for TDF boilers for opacity, but instead the citation has been changed to 40 CFR Section 64 (CAM). Monitoring of opacity is part of the compliance demonstration program that Heartland will perform for the particulate matter standards.
7. The permit limit sets an emission limit on the baghouse that controls the ash handling system, and an opacity limit. Because of concerns expressed by the public, the permit has been amended to require that a pneumatic ash handling system be used so that fugitive

emissions from the loading should be essentially zero. The permit now includes a requirement for Heartland to produce an ash management plan and test its ash.

8. In response to the concerns expressed regarding incomplete combustion, the permit has been amended to add an additional, short term CO limit of 0.090 lb/mmBtu with the averaging time of 1 calendar day, rather than 30 days. Setting the emission limit on a shorter averaging time will further ensure that combustion is complete. The selection of one calendar day is consistent with the proposed MACT standard for Industrial, Commercial, and Institutional Boilers (40 CFR 63, subp. DDDDD).

The Heartland Facility will not be subject to the proposed MACT because the source does not have potential emissions of HAPs that are considered major.

8. Due to concerns over proper operation of the baghouses, a requirement for the company to continuously monitor and record baghouse pressure drop on the boiler baghouse has been added. Also, an alarm must sound if the pressure drop is out of range.
9. The company has chosen to accept requirements for emergency action plans and contingency plans, typically applicable to waste combustors.
10. The MPCA staff agree that some of the conditions pertaining to ash management under Minn. R. 7007.0801 apply to the facility and have included the requirement to submit an ash management plan to the Commissioner for approval. Also included is the requirement to develop a schedule for testing the ash.
11. A requirement for testing for dioxins and metals has been placed into the permit.
12. A requirement for monitoring carbon monoxide on a 24 hour average as well as a 30-day rolling average was added.
13. A requirement to submit contingency plans prior to boiler startup was added.

#### **4. Conclusion**

Based on the information provided by Heartland Energy, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 04500050-001, and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Jenny L. Reinertsen, Greg Berger

Attachment: Calculations  
CAM Submittals  
Emission Comparison

## Calculations

***Heartland Energy Potential Emission Totals***

Emission Unit	PM	PM <sub>10</sub>	SO <sub>2</sub>	No <sub>x</sub>	VOC	CO	Sngl Hap	Total Hap
Boiler 1	65.00	65.00	115.00	222.00	25.00	116.00	9.00	9.45
Engines	0.70	0.70	0.65	22.17	0.83	3.04		
Materials handling	5.06	5.06						
Tanks								
Totals	70.76	70.76	115.65	244.17	25.83	119.04	9.00	9.45

\*These potentials take all enforceable limits on emissions and fuel use into account

***Materials Handling***

EU	Process	Emission Factor lb/ton	Process Rate ton/hour	Hours/yr	Capture	Control	Control Equipment	PM/PM10 lb/hr	tpy
EU003	Limestone unloading - silo	0.0026	0.675	8760	100	98	baghouse	0.0000351	0.000154
EU004	Lime unloading to silo	2.2	25	8760	100	98	baghouse	1.1	4.818000
EU005	Fly ash conveyed to silo	2.2	1.25	8760	100	98	baghouse	0.055	0.240900
TOTAL								1.1550351	5.059054

notes Limestone unloading factors from ap42 11.19.1-1, Emission Factors For Industrial Sand and Gravel Processing with Wet Scrubber.

Emission factor was increased to eliminate removal efficiency of the wet scrubber.

Lime factors taken from ap42 11.17-4, Emission Factors for Lime Manufacturing Raw Material...

Due to similar texture and weight, Lime factor used for ash storage as well.

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Method = Scaled from Rialto Estimate or Permit Limit

Heartland Flow Rate = 109,783 acfm T = 180 F M = 3.5 %  
 = 86,077 dscfm (Stack parameters obtained from Heartland's permit application)  
 Rialto Flow Rate = 143,527 dscfm (Heartland dscfm calculated from stack parameters in application)  
 Boiler heat input = 351 mmBtu/hr

Pollutant	Rialto emissions		Heartland controlled emissions	tpy	lb/mmBtu	
	g/s	lb/hour	lb/hour			
Particulate Matter			14.840	65	0.04228	permit limit
Particulate Matter <10 um			14.840	65	0.04228	permit limit
Sulfur Dioxide			26.256	115	0.07480	permit limit
Nitrogen Oxides			50.685	222	0.14440	permit limit
Carbon Monoxide			26.484	116	0.07545	permit limit
Volatile Organic Comp.			5.708	25	0.01626	Rialto Estimate
VOCs	9.66E-01	7.67E+00				
Acenaphthene	1.95E-06	1.55E-05	9.29E-06	4.07E-05	2.65E-08	Rialto Estimate:
Acenaphthylene	2.10E-05	1.67E-04	9.99E-05	4.37E-04	2.84E-07	"
Anthracene	2.05E-05	1.63E-04	9.76E-05	4.27E-04	2.78E-07	"
*Antimony	3.26E-06	2.59E-05	1.55E-05	6.80E-05	4.42E-08	"
*Arsenic	man guarantee		4.00E-03	1.75E-02	1.14E-05	"
Benzanthracene	3.89E-08	3.09E-07	1.85E-07	8.12E-07	5.28E-10	"
*Benzo (b+k)fluoranthene	5.78E-08	4.59E-07	2.75E-07	1.20E-06	7.84E-10	"
*Benzo(a)pyrene	3.89E-08	3.09E-07	1.85E-07	8.12E-07	5.28E-10	"
Benzo(e)pyrene	7.97E-07	6.33E-06	3.79E-06	1.66E-05	1.08E-08	"
Benzo(ghi)perylene	3.89E-08	3.09E-07	1.85E-07	8.12E-07	5.28E-10	"
Benzo(j)fluoranthene	3.89E-08	3.09E-07	1.85E-07	8.12E-07	5.28E-10	"
*Beryllium	3.04E-08	2.41E-07	1.44E-07	6.33E-07	4.12E-10	"
*Cadmium	5.04E-05	4.00E-04	2.40E-04	1.05E-03	6.83E-07	"
Carbazole	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	"
*Chromium	5.16E-05	4.10E-04	2.46E-04	1.08E-03	7.00E-07	"

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*Chrysene	3.89E-08	3.09E-07	1.85E-07	8.12E-07	5.28E-10	"
*Dibenz(a,h)anthracene	3.89E-08	3.09E-07	1.85E-07	8.12E-07	5.28E-10	"
Dichlorobenzene	3.89E-07	3.09E-06	1.85E-06	8.12E-06	5.28E-09	"
Dichlorophenol	3.89E-07	3.09E-06	1.85E-06	8.12E-06	5.28E-09	"
Floranthene	4.98E-05	3.95E-04	2.37E-04	1.04E-03	6.76E-07	"
Florene	4.11E-06	3.26E-05	1.96E-05	8.57E-05	5.57E-08	"
*Hexachlorobenzene	1.56E-07	1.24E-06	7.42E-07	3.25E-06	2.11E-09	"
Hydrogen Chloride*	permit		0.00E+00	<b>9.00E+00</b>	0.00E+00	"
	limit					
*Hydrogen Fluoride	1.01E-03	7.98E-03	4.79E-03	2.10E-02	1.36E-05	"
Indeno(1,2,3-cd)pyrene	3.89E-08	3.09E-07	1.85E-07	8.12E-07	5.28E-10	"
*Lead	4.36E-04	3.46E-03	2.07E-03	9.08E-03	5.91E-06	"
*Manganese	1.41E-04	1.12E-03	6.69E-04	2.93E-03	1.91E-06	"
*Mercury	4.77E-04	3.79E-03	2.27E-03	9.94E-03	6.47E-06	"
*Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	"

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*Nickel	7.83E-05	6.22E-04	3.73E-04	1.63E-03	1.06E-06	"
*PCB	1.56E-07	1.24E-06	7.42E-07	3.25E-06	2.11E-09	"
Pentachlorobenzene	1.56E-07	1.24E-06	7.42E-07	3.25E-06	2.11E-09	"
Pentachlorophenol	3.89E-07	3.09E-06	1.85E-06	8.12E-06	5.28E-09	"
Phenanthrene	1.64E-04	1.30E-03	7.82E-04	3.42E-03	2.23E-06	"
Pyrene	2.29E-05	1.82E-04	1.09E-04	4.78E-04	3.11E-07	"
*Selenium	4.87E-05	3.86E-04	2.32E-04	1.01E-03	6.60E-07	"
Tetrachlorobenzene	1.56E-07	1.24E-06	7.42E-07	3.25E-06	2.11E-09	"
Tetrachlorophenol	3.89E-07	3.09E-06	1.85E-06	8.12E-06	5.28E-09	"
Trichlorobenzene	1.56E-07	1.24E-06	7.42E-07	3.25E-06	2.11E-09	"
Trichlorophenol	3.89E-07	3.09E-06	1.85E-06	8.12E-06	5.28E-09	"
*Vinyl Chloride	1.82E-02	1.45E-01	8.68E-02	3.80E-01	2.47E-04	"
*T4CDF	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	"
P5CDF	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	"
H6CDF	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	"
H7CDF	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	"
OCDF	3.89E-10	3.09E-09	1.85E-09	8.12E-09	5.28E-12	<div> <div>Total HAP emissions =</div> <div>9.45</div> </div>
T4CDD	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	
P5CDD	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	
H6CDD	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	"
H6CDD	1.95E-10	1.55E-09	9.27E-10	4.06E-09	2.64E-12	"
OCDD	3.89E-10	3.09E-09	1.85E-09	8.12E-09	5.28E-12	"

**HAPs total 9.45E+00**

Assumptions:

Rialto, Heartland, and the test plant had the same flue gas moisture  
 All plants were operated with the same level of excess air  
 Emission rates for all non-detects was 1/2 the detection limit  
 Rialto emissions are based on test data from a 9ft2 test fluidized bed  
*Non-detects are noted by italization*  
 All have baghouse controls, and calculated potential emissions are partially controlled emission rates  
 \* = hap

Notes:

HCl emissions potential given by permit limit of 9 tpy



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SO2 Emission Rate	503	lb/hour	uncontrolled, and assuming all S goes to SO2
Then, assume bed captures 60%			
SO2 Emission rate	201.20	lb/hour	
SO2 to SO3 Conversion rate	4	%	Power Engineering, 11/02 Title: Acid Mist Causes Problems for FGD Systems
SO2 Emission rate after conversion	193.15	lb/hour	AP42, 1.1-19, 9/98 says rate is closer to 0.7%
SO2 Emissions available for conversion	8.05	lb/hour	
SO2 atomic weight	64		
SO3 atomic weight	80		
H2SO4 atomic weight	98		
SO3 Emission rate	10.06	lb/hour	
H2SO4 Emission rate	12.324	lb/hour	uncontrolled
99% Scrubber Control	0.123	lb/hour	0.54 tpy
**95% Scrubber Control	0.616	lb/hour	2.70 tpy
70% Scrubber Control	3.697	lb/hour	16.19 tpy
*50% Scrubber Control	6.162	lb/hour	26.99 tpy

\*Use for worst case scenario

\*\*Use for likely emissions

**Single Engine Potential Emissions**

Heat

Input 20.057 mmBtu/hour

Annual Operating Hours =

650

(all engines are the same)

**Fuel Type: Diesel**

Pollutant	Factor	units	lb/hour	tpy	
PM		lb/mmBtu	1.080	0.35	man. Guarantee
PM10		lb/mmBtu	1.080	0.35	man. Guarantee
SO2	0.05	lb/mmBtu	1.003	0.33	Table 3.4-1
Nox		lb/mmBtu	34.100	11.08	man. Guarantee
CO		lb/mmBtu	4.680	1.52	man. Guarantee
VOC		lb/mmBtu	1.280	0.42	man. Guarantee

Benzene\	7.76E-04	lb/mmBtu	0.016	0.01	Table 3.4-3
Toluene	2.81E-04	lb/mmBtu	0.006	0.00	Table 3.4-3
Xylenes	1.93E-04	lb/mmBtu	0.004	0.00	Table 3.4-3
Propylene	2.79E-03	lb/mmBtu	0.056	0.02	Table 3.4-3
Formaldehyde	7.89E-05	lb/mmBtu	0.002	0.00	Table 3.4-3
Acetaldehyde	2.52E-05	lb/mmBtu	0.001	0.00	Table 3.4-3
Acrolein	7.88E-06	lb/mmBtu	0.000	0.00	Table 3.4-3
Naphthalene	1.30E-04	lb/mmBtu	0.003	0.00	Table 3.4-3

CAM Submittals for particulate matter, PM<sub>10</sub>, and hydrogen chloride

**COMPLIANCE ASSURANCE MONITORING  
Spray Dryer Scrubber for HCl CONTROL  
HEARTLAND ENERGY AND RECYCLING**

I. Background

A. Emission Unit

Description: Fluidized Bed Boiler

Identification: EU-001

Facility: Preston, MN

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation No.: Permit

Emission Limits:

Hydrogen Chloride: 2.05 lbs/hour

Monitoring Requirements: SO<sub>2</sub> CEM as a surrogate for HCL, along with an annual stack emissions testing to develop a correlation curve between SO<sub>2</sub> and HCl.

C. Control Technology

Spray dryer scrubber

II. Monitoring Approach

The key elements of the monitoring approach are presented in Table A.1-1.

**TABLE A.1.1 MONITORING APPROACH**

I. Indicator  Measurement Approach	SO <sub>2</sub> Emissions  For monitoring of HCl emission, the SO <sub>2</sub> CEM will be the surrogate for compliance demonstration.	Annual Stack Emission Testing  A performance test is due 180 days after initial startup. The test shall be performed at three different spray dryer/fabric filter-operating conditions to develop a correlation between SO <sub>2</sub> CEM output and actual HCl emissions.  The correlation is to be submitted to the MPCA with the stack test report.
II. Indicator Range	If sufficient removal of SO <sub>2</sub> is continuously demonstrated via CEMS, it can be reasonably assumed that adequate HCl removal is achieved.	Tested emission rate of HCl in lbs/hour correlated to SO <sub>2</sub> emissions.
III. Performance Criteria  A. Data Representativeness        B. Verification of Operation Status	<p>The SO<sub>2</sub> monitoring system shall be capable of determining emissions on a lb/MMBtu basis on a 30-day rolling average. CEM certification test.</p> <p>Daily calibration error (CE) Test shall be conducted in accordance with 40 CFR part 75 appendix B.</p> <p>A linearity and leak check test to be performed before the end of each QA operating quarter following the CEMS certification test. Test shall be conducted in accordance with 40 CFR part 75 appendix B.</p> <p>CEMS relative accuracy test audit (RATA) will be completed before the end of each two QA operating quarters following CEMS certification test. If the RATA results indicate a relative accuracy of 7.5% or less, the next RATA is not required for 12 months.</p>	<p>The emission testing will be used to develop a correlation between SO<sub>2</sub> emission and HCl emissions.</p> <p>The correlation developed from the stack testing will be used to verify that based on the emissions of SO<sub>2</sub> that the emissions of HCl are in compliance.</p> <p>According to the EPA – “The EPA’s current data indicate that HCl is preferentially removed and that high levels of SO<sub>2</sub> removal indicate high levels of HCl removal. Therefore, the SO<sub>2</sub> CEMS being required will provide an indication of HCl control.”</p>

C. QA/QC Practices and Criteria	The CEM shall be operated, calibrated, and maintained in accordance with the QA/QC procedures in 40 CFR part 75 appendix B as amended.	NA
D. Monitoring Frequency	Continuous	Annual for stack testing, daily checks for HCl correlation.
Data Collection Procedure	Data will be 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.	On a daily basis the correlation between SO <sub>2</sub> and HCL will be reviewed to make sure the HCL emission has not been exceeded.
Averaging Period	Records of the CEM monitoring data and support information will be kept on-site for a period of five years.	
	30 day rolling average	Daily for HCl correlation.

## **Background**

The pollutant-specific emission unit is the fluidized bed boiler EU001. The fluidized bed boiler combusts tire derived fuel in order to make steam that is used to generate electricity. The control equipment on the boiler consists of a fabric filter for particulate control, selective non-catalytic reduction for nitrogen oxide control, and a spray dryer scrubber/fabric filter for sulfur dioxide and hydrogen chloride control. This compliance assurance monitoring (CAM) plan focuses on the spray dryer scrubber used for hydrogen chloride control.

## **Rationale for Selection of Performance Indicators**

Sulfur dioxide was selected as the performance indicator because it is indicative of HCl removal efficiency from a lime scrubber. Since the HCl removal efficiency with lime scrubbing is greater than for SO<sub>2</sub>, continuously monitoring SO<sub>2</sub> emissions will predict the emissions of HCl. Thus, if sufficient removal of SO<sub>2</sub> is continuously demonstrated via CEMs, it can be reasonably assumed that adequate HCl removal is achieved as well. The New Source Performance Standards for municipal waste combustors promulgated in 1995 (a post 1990 standard that is presumed to have included enhanced monitoring), require CEMs for SO<sub>2</sub> but no additional monitoring indicators for HCl emissions. Also, EPA explained the reason for this in its response to public comments on the issue:

“The EPA’s current data indicate that HCl is preferentially removed and that high levels of SO<sub>2</sub> removal indicate high levels of HCl removal. Therefore, the SO<sub>2</sub> CEMs being required will provide an indication of HCl control.”

An initial performance test for HCl will be used to develop a correlation curve between SO<sub>2</sub> emission readings from the CEM and actual HCl emissions. Annual HCl emission testing will be used to confirm the correlation between HCl and SO<sub>2</sub> for the life of the project.

## **Rationale for Selection of Indicator Ranges**

The selected indicator will be based on the correlation curve to be developed during the initial performance testing.

When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All excursions will be documented and reported.

**COMPLIANCE ASSURANCE MONITORING  
FABRIC FILER FOR PM/PM<sub>10</sub> CONTROL  
HEARTLAND ENERGY AND RECYCLING**

III. Background

A. Emission Unit

Description: Fluidized Bed Boiler

Identification: EU-001

Facility: Preston, MN

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation No.: Permit

Emission Limits:

Particulate Matter: 0.042 lb/MMBtu heat input. (Applies at all times except during periods of startup, shutdown, or malfunction.)

Particulate Matter less than 10 microns: 0.042 lb/MMBtu heat input. (Applies at all times except during periods of startup, shutdown, or malfunction.)

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. The opacity standard applies at all times, except during periods of startup, shutdown, and malfunction.

Monitoring Requirements: Opacity Monitor

C. Control Technology

Pulse –jet baghouse operated under negative pressure. High Temperature, i.e. T>260 Degrees F.

IV. Monitoring Approach

The key elements of the monitoring approach are presented in Table A.1-1.



**TABLE A.1.1      MONITORING APPROACH**

I. Indicator	Visible Emissions	Pressure Drop
Measurement Approach	Visible emissions from the baghouse exhaust will be monitored continuously with an opacity monitor capable of determining opacity in terms of percent, and capable of calculating 6-minute averages.	Pressure drop across the baghouse is measured with a differential pressure gauge
II. Indicator Range	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. The opacity standard applies at all times, except during periods of startup, shutdown, and malfunction.	An excursion is defined as a pressure drop greater than 10 in. H <sub>2</sub> O or less than 2 inches of H <sub>2</sub> O. Excursions trigger an inspection, corrective action, and a reporting requirement.
III. Performance Criteria		
A. Data Representativeness	The opacity monitor will be operated and data recorded during all periods of emission unit operation including periods of emission unit startup-up, shutdown, or malfunction except for periods of acceptable monitor downtime. Acceptable monitor downtime includes reasonable periods as listed in items A, B, C and D of Minn. R. 7017.1090, subp.2.	Pressure taps are located at the baghouse inlet and outlet. The gauge has a minimum accuracy of 0.25 in. H <sub>2</sub> O.
B. Verification of Operation Status	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 exceeds twice the specification of PS-1 of 40 CFR 60 Appendix B.	NA
	COMS calibration error audit: the audit will be conducted before the 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.	The pressure gauge is calibrated quarterly, pressure taps are checked for plugging daily.
C. QA/QC Practices and	Continuous	Pressure drop is monitored continuously.

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Criteria	Data will be reduced 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.	Pressure drop is manually recorded daily.
D. Monitoring Frequency	6-minute averages	None
Data Collection Procedure		
Averaging Period		

## **Background**

The pollutant-specific emission unit is the fluidized bed boiler EU001. The fluidized bed boiler combusts tire derived fuel in order to make steam that is used to generate electricity. The control equipment on the boiler consists of a fabric filter for particulate control, selective non-catalytic reduction for nitrogen oxide control, and a spray dryer/fabric filter for sulfur dioxide and hydrogen chloride control. This compliance assurance monitoring (CAM) plan focuses on the fabric filter used for particulate matter control.

## **Rationale for Selection of Performance Indicators**

Opacity was selected as the performance indicator because it is indicative of good operation and maintenance of the baghouse. When the baghouse is operating properly, there will not be any opacity (visible emissions) from the exhaust. Any increase in opacity indicates reduced performance of a particulate control device; therefore, the presence of opacity is used as a performance indicator.

In general, baghouses are designed to operate within a range of pressure drop. Monitoring pressure drop provides a means of detecting a change in operation that could lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough (failure of the automatic pressure sensing cleaning cycle), cleaning equipment is damaged, the bags are becoming blinded, or the airflow has increased. A decrease in pressure drop may indicate broken bags or structural damage. Either one of these problems is also indicated by the presence of opacity. A pressure drop across the baghouse also serves to indicate that there is airflow through the control device.

## **Rationale for Selection of Indicator Ranges**

The selected indicator is opacity less than 20 percent. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All excursions will be documented and reported. An indicator range of less than 20 percent opacity was selected because: an increase in opacity is indicative of an increase in particulate emissions.

The indicator range chosen for the baghouse pressure drop is 2-10 inches H<sub>2</sub>O. An excursion to the low or high side of this range triggers an inspection, corrective action, and a reporting requirement. The pressure drop is recorded daily. Bag replacement is performed when subtle increases of opacity are noticed during the cleaning cycle of each baghouse module or pressure drop excursions beyond the norm are noticed. The bags have a guaranteed life of 18 months and are typically changed when either

pressure drop or opacity variation shows that attention is warranted. Each baghouse module can be isolated for off line cleaning and maintenance. Separate pressure drop gauges are installed on each module allowing trouble-shooting within each section of the baghouse. Individual rows of bags can be cleaned with each module allowing further isolation of bag failure. Bag replacement is typically done in a staggered timetable with each module isolated and changed while the rest of the modules handle the flow from the boiler, which remains on-line. This indicator is also used to monitor for the bypass of the control device. If the pressure drop falls below 1 inch H<sub>2</sub>O during normal process operation, the possibility of bypass is investigated.

## Comparison of HAP Emissions From Various Fuels

### *HAP Emissions Comparison between TDF and Other Fuels/plants*

Heat Input: 351 mmBtu

#### *Rialto Scale Up*

<i>Pollutant</i>	<i>Coal</i>	<i>Coal</i>	<i>Coal</i>	<i>Wood</i>	<i>Wood</i>	<i>Wood</i>	<i>Modesto</i>	<i>Modesto</i>	<i>Rialto</i>	<i>Heartland</i>	<i>Heartland</i>
	<i>lb/ton</i>	<i>lb/mmBtu</i>	<i>351 mmBtu Plant, lb/yr</i>	<i>lb/mmBtu</i>	<i>351 mmBtu Plant, lb/hr</i>	<i>351 mmBtu Plant, lb/yr</i>	<i>TDF</i>	<i>351 mmBtu Plant, lb/yr</i>	<i>TDF</i>	<i>351 mmBtu Plant, lb/hr</i>	<i>351 mmBtu Plant, lb/yr</i>
Arsenic	4.10E-04	2.41E-05	74.16	2.20E-05	7.72E-03	67.64	0.00E+00	0.00	1.14E-05	4.00E-03	35.04
Beryllium	2.10E-05	1.24E-06	3.80	4.10E-06	1.44E-03	12.61	3.70E-06	11.38	4.12E-10	1.44E-07	0.00
Cadmium	5.10E-05	3.00E-06	9.22	2.10E-05	7.37E-03	64.57	4.70E-06	14.45	6.83E-07	2.40E-04	2.10
Chromium	2.60E-04	1.53E-05	47.03	4.80E-05	1.68E-02	147.59	1.30E-06	4.00	7.00E-07	2.46E-04	2.15
Lead	4.20E-04	2.47E-05	75.96	4.80E-05	1.68E-02	147.59			5.91E-06	2.07E-03	18.17
Mercury	8.30E-05	4.88E-06	15.01	3.50E-06	1.23E-03	10.76			6.47E-06	2.27E-03	19.89
Manganese	4.90E-04	2.88E-05	88.63	1.60E-03	5.62E-01	4919.62			1.91E-06	6.69E-04	5.86
Nickel	2.80E-04	1.65E-05	50.64	3.30E-05	1.16E-02	101.47			1.06E-06	3.73E-04	3.27
Dibenz(a,h)anthracene	8.00E-08	4.71E-09	0.01	1.60E-03	5.62E-01	4919.62	1.60E-06	4.92	5.28E-10	1.85E-07	0.00
Dichlorobenzene				3.50E-06	1.23E-03	10.76	6.70E-07	2.06	5.28E-09	1.85E-06	0.02
Hexachlorobenzene				3.30E-05	1.16E-02	101.47	6.30E-06	19.37	2.11E-09	7.42E-07	0.01
Hydrogen Chloride*	1.2	7.06E-02	217041.88	2.80E-06	9.83E-04	8.61		0.00	1.67E-04	5.87E-02	514.52
			0.00		0.00E+00	0.00		0.00		0.00E+00	0.00
Acenaphthene	5.10E-07	3.00E-08	0.09	7.90E-06	2.77E-03	24.29		0.00	2.65E-08	9.29E-06	0.08
Acetaldehyde	5.70E-04	3.35E-05	1752.61	8.30E-04	2.91E-01	2552.05		0.00		0.00E+00	0.00
Acetophenone	1.50E-05	8.82E-07	46.12	3.20E-09	1.12E-06	0.01		0.00		0.00E+00	0.00
Acrolein	2.90E-04	1.71E-05	891.68	4.00E-03	1.40E+00	12299.04		0.00		0.00E+00	0.00
Benanthracene		0.00E+00	64.57	1.10E-06	3.86E-04	3.38	0.00E+00	0.00	5.28E-10	1.85E-07	0.00
Benzene	1.30E-03	7.65E-05	3997.19	4.20E-03	1.47E+00	12913.99	0	0.00		0.00E+00	0.00
Benzyl chloride	7.00E-04	4.12E-05	2152.33		0.00E+00	0.00		0.00		0.00E+00	0.00
DEHP	7.30E-05	4.29E-06	224.46		0.00E+00	0.00		0.00		0.00E+00	0.00
Bromoform	3.90E-05	2.29E-06	119.92		0.00E+00	0.00		0.00		0.00E+00	0.00

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Carbon disulfide	1.30E-04	7.65E-06	399.72		0.00E+00	0.00		0.00		0.00E+00	0.00
Carbon tetrachloride		0.00E+00	0.00	4.50E-05	1.58E-02	138.36		0.00		0.00E+00	0.00
2-chloroacetophenone	7.00E-06	4.12E-07	21.52		0.00E+00	0.00		0.00		0.00E+00	0.00
Chlorobenzene	2.20E-05	1.29E-06	67.64	3.30E-05	1.16E-02	101.47		0.00		0.00E+00	0.00
Chloroform	5.90E-05	3.47E-06	181.41	2.80E-05	9.83E-03	86.09		0.00		0.00E+00	0.00
Chlorine		0.00E+00	0.00	7.90E-04	2.77E-01	2429.06		0.00		0.00E+00	0.00
Cumene	5.30E-06	3.12E-07	16.30		0.00E+00	0.00		0.00		0.00E+00	0.00
2,4 Dinitrotoluene	2.80E-07	1.65E-08	0.86		0.00E+00	0.00		0.00		0.00E+00	0.00
Dimethyl sulfate	4.80E-05	2.82E-06	8.68		0.00E+00	0.00		0.00		0.00E+00	0.00
Ethyl benzene	9.40E-05	5.53E-06	289.03	3.10E-05	1.09E-02	95.32		0.00		0.00E+00	0.00
Ethyl chloride	4.20E-05	2.47E-06	129.14		0.00E+00	0.00		0.00		0.00E+00	0.00
Ethylene dichloride	4.00E-05	2.35E-06	122.99		0.00E+00	0.00		0.00		0.00E+00	0.00
Ethylene dibromide	1.20E-06	7.06E-08	3.69		0.00E+00	0.00		0.00		0.00E+00	0.00
Formaldehyde	2.40E-04	1.41E-05	737.94	4.40E-03	1.54E+00	13528.94	1.70E-04	522.71		0.00E+00	0.00
Hexane	6.70E-05	3.94E-06	206.01		0.00E+00	0.00		0.00		0.00E+00	0.00
Hexachlorobenzene		0.00E+00	0.00		0.00E+00	0.00		0.00	6.47E-06	2.27E-03	19.89
Isophorone	5.80E-04	3.41E-05	1783.36		0.00E+00	0.00		0.00		0.00E+00	0.00
Methyl bromide	1.60E-04	9.41E-06	491.96		0.00E+00	0.00		0.00		0.00E+00	0.00
Methyl chloride	5.30E-04	3.12E-05	1629.62		0.00E+00	0.00		0.00		0.00E+00	0.00
MEK	3.90E-04	2.29E-05	1199.16		0.00E+00	0.00		0.00		0.00E+00	0.00
Methyl hydrazine	1.70E-04	1.00E-05	522.71		0.00E+00	0.00		0.00		0.00E+00	0.00

Methyl methacrylate	2.00E-05	1.18E-06	61.50		0.00E+00	0.00		0.00		0.00E+00	0.00
Methyl tert butyl ether	3.50E-05	2.06E-06	107.62		0.00E+00	0.00		0.00		0.00E+00	0.00
Methylene chloride	2.90E-04	1.71E-05	891.68		0.00E+00	0.00		0.00		0.00E+00	0.00
Naphthalene	1.30E-05	7.65E-07	39.97	9.70E-05	3.40E-02	298.25	1.20E-06	3.69	0	0.00E+00	0.00
Pentachlorophenol		0.00E+00	0.00		0.00E+00	0.00		0.00	2.11E-09	7.42E-07	0.01
Phenol	1.60E-05	9.41E-07	49.20	5.10E-05	1.79E-02	156.81	0	0.00		0.00E+00	0.00
PCB		0.00E+00	0.00		0.00E+00	0.00		0.00	5.28E-09	1.85E-06	0.02
Propionaldehyde	3.80E-04	2.24E-05	1168.41	6.10E-05	2.14E-02	187.56		0.00		0.00E+00	0.00
Tetrachloroethylene	4.30E-05	2.53E-06	132.21	3.80E-05	1.33E-02	116.84		0.00		0.00E+00	0.00
Toluene	2.40E-04	1.41E-05	737.94	9.20E-04	3.23E-01	2828.78		0.00		0.00E+00	0.00
Styrene	2.50E-05	1.47E-06	76.87		0.00E+00	0.00		0.00		0.00E+00	0.00
Xylenes	3.70E-05	2.18E-06	113.77		0.00E+00	0.00		0.00		0.00E+00	0.00
Vinyl Acetate	7.60E-06	4.47E-07	23.37		0.00E+00	0.00		0.00		0.00E+00	0.00
Vinyl Chloride			0.00	1.80E-05	6.32E-03	55.35	0	0.00	5.91E-06	2.07E-03	18.17
			0.00		0.00E+00	0.00		0.00		0.00E+00	0.00
<b>Dioxins and Furans</b>	<b>2.44E-07</b>	<b>1.44E-08</b>	<b>0.75</b>	<b>1.32E-09</b>	<b>4.63E-07</b>	<b>4.05E-03</b>	<b>9.20E-11</b>	<b>2.83E-04</b>	<b>3.17E-11</b>	<b>1.11E-08</b>	<b>9.74E-05</b>

Wood factors for boilers with particulate control only, source: AP42

Coal factors: control used when possible, source: AP42

Modesto: ff/sd control, whole tires burned, actual stack test data

Heartland emissions scaled from 9 ft2 pilot test data, baghouse control although actual plant will also have scrubber

Italised numbers represent 1/2detection limit, i.e. none detected

\*\*MACT has not been proposed as of yet. This is only initial EPA power point summary

Mass balance from EPA ICR Data, predicted Hg emissions, no control, are 11.7 lb/year (3.58E-12 lb/btu)

Predicted emissions using the rumored Hg standard in the industrial boiler mact are 3 lb/hear (1E-12 lb/btu)