

AIR EMISSION PERMIT NO. 12300088-003

IS ISSUED TO

Northern Iron of St Paul LLC

NORTHERN IRON & MACHINE

867 Forest Street

St. Paul, Ramsey County, MN 55106

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	08/14/1995 issued 01/31/2003
Major Amendment	01/06/2004 issued 01/07/2004
Administrative Amendment	03/10/2008 see below

This permit supersedes permit number 12300088-002 and authorizes the permittee to operate the stationary source at the address listed above unless otherwise noted in Table A. The permittee must comply with all the conditions of the permit. Any changes or modifications to the stationary source must be performed in compliance with Minn. R. 7007.1150 to 7007.1500. Terms used in the permit are as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

Permit Type: State; Limits to Avoid Pt 70/
Major under NSR

Issue Date: January 31, 2003

Expiration: Permit does not expire
All Title I Conditions do not expire.

Administrative Amendment
Issue Date: July 15, 2008

Jeff J. Smith, Manager
Air Quality Permits Section
Industrial Division

for Brad Moore
Commissioner
Minnesota Pollution Control Agency

TABLE OF CONTENTS

Notice to the Permittee

Permit Shield

Facility Description

Table A: Limits and Other Requirements

Table B: Submittals

Table C: *not used in this permit*

Appendix A: *not used in this permit*

Appendix B: VOC and HAP Emission Factors for Pouring/Cooling/Shakeout

Appendix C: VOC and HAP Evaporation Rates for Sand/Resin/Catalyst Mixing

Appendix D: Insignificant Activities Required to be Listed

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. However, the permit shield does not apply to any national ambient air quality standard adopted under section 109 of the Clean Air Act and any state ambient air quality standard under Minn. R. ch. 7009. 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:

Northern Iron and Machine operates a gray and ductile iron foundry in St. Paul, Minnesota. The facility is subject to a 100 ton per year (tpy) major source threshold under New Source Review. The facility received a state permit (12300088-001), therefore conditions limiting Hazardous Air Pollutant (HAP) emissions to less than 10/25 tpy (individual/total HAPs) and limiting Particulate Matter less than 10 um in size (PM₁₀) and Volatile Organic Compound emissions to less than 100 tpy were included in the permit. Total Particulate Matter (PM) was greater than 100 tpy, so the facility remains a major source under New Source Review, but since PM is not regulated under the Part 70 permit program, the facility received a federally enforceable state operating permit (12300088-001).

Emissions are primarily generated by sand handling operations for mold and core production and metal handling operations, including melting, casting, and finishing. Sand handling processes involve conveying, pneumatic transport, storage, mulling, and mixing of new silica sand and recycled foundry sand. Binder resins are mixed with this sand to make the molds and cores used at the facility. Certain cores are washed and baked prior to being placed in a mold. Purchased scrap steel is preheated in an oven prior to being melted in electric induction furnaces. Foundry returns and any necessary alloying elements are combined with the melted scrap to produce a molten iron charge. This charge is poured into a mold and allowed to cool before the casting is removed from the mold and core sand in the shakeout process. The iron castings are then cleaned and finished prior to being shipped as a final product. Finishing operations may include heat treating/annealing, shot blasting, and grinding.

PERMIT ACTION 002 Major Amendment

This amendment corrected an error in the original Air Emissions Permit. Under GP006, the initial permit allowed only the use of natural gas in the ovens and furnaces. However, the permit analysis included propane in the calculations, and the public noticed potential to emit included propane emissions. It was an error that propane was not included as an allowed fuel. Under Minn. R. 7007.1600, subp. 1(C), this is a material error in the permit and mandates reopening of the permit. This change cannot be made under the Administrative Amendment procedures of Minn. R. 7007.1400, therefore the change is processed as a major amendment under Minn. R. 7007.1600, subp. 3. Because this permit is a state permit, and the change is not described by Minn. R. 7007.1500, subp. 1(C) or (D), public notice and U.S. Environmental Protection Agency's notification are not required.

PERMIT ACTION 003 Administrative Amendment

This administrative amendment will change the facility name to Northern Iron & Machine (formerly Versa Iron & Machine) and the new owner/operator of the facility is Northern Iron of St. Paul, LLC (formerly Versa Companies).

TABLE A: LIMITS AND OTHER REQUIREMENTS

A-1

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

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

Subject Item: Total Facility

What to do	Why to do it
OPERATIONAL REQUIREMENTS	hdr
Circumvention: Do not install or use a device or means that conceals or dilutes emissions, which would otherwise violate a federal or state air pollution control rule, without reducing the total amount of pollutant emitted.	Minn. R. 7011.0020
Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated, unless otherwise noted in Table A.	Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J)
Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan for all air pollution control equipment. At a minimum, the O & M plan shall identify all air pollution control equipment and 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.	Minn. R. 7007.0800, subp. 14 and Minn. R. 7007.0800, subp. 16(J)
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
Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150.	Minn. R. 7011.0150
Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7030.0010 - 7030.0080
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)
The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.	Minn. R. 7007.0800, subp. 16
PERFORMANCE TESTING	hdr
Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C.	Minn. R. ch. 7017
Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as specified by Minn. R. 7017.2025 following formal review of a subsequent performance test on the same unit.	Minn. R. 7017.2025
MONITORING REQUIREMENTS	hdr
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)
RECORDKEEPING	hdr
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**A-2**

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

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)
When the Permittee determines that no permit amendment or notification is required prior to making a change, the Permittee must retain records of all calculations required under Minn. R. 7007.1200. For expiring permits, these records shall be kept for a period of five years from the date the change was made or until permit reissuance, whichever is longer. For nonexpiring permits, these records shall be kept for a period of five years from the date that the change was made. The records shall be kept at the stationary source for the current calendar year of operation and may be kept at the stationary source or office of the stationary source for all other years. The records may be maintained in either electronic or paper format.	Minn. R. 7007.1200, subp. 4
REPORTING/SUBMITTALS	hdr
Shutdown Notifications: Notify the Commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the owner or operator does not have advance knowledge of the shutdown, notification shall be made to the Commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 3. At the time of notification, the owner or operator shall inform the Commissioner of the cause of the shutdown and the estimated duration. The owner or operator shall notify the Commissioner when the shutdown is over.	Minn. R. 7019.1000, subp. 3
Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 2. At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over.	Minn. R. 7019.1000, subp. 2
Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment.	Minn. R. 7019.1000, subp. 1
Notification of Deviations Endangering Human Health or the Environment Report: Within 2 working days of discovery, notify the Commissioner in writing of any deviation from permit conditions which could endanger human health or the environment. Include the following information in this written description: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.	Minn. R. 7019.1000, subp. 1
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)
Emission Inventory Report: due April 1 days after end of each calendar year following permit issuance. To be submitted on a form approved by the Commissioner.	Minn. R. 7019.3000 through Minn. R. 7019.3010
Emission Fees: due 60 days after receipt of an MPCA bill.	Minn. R. 7002.0005 through Minn. R. 7002.0095
NAAQS ISSUE	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Northern Iron of St Paul LLC
Permit Number: 12300088 - 003

This permit requires modeling to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). The Permittee may not make any change at the source that would result in an increase in PM10 emissions, until it can be demonstrated that emissions from the facility as permitted do not cause an exceedance of the NAAQS. This includes changes that might otherwise qualify as insignificant modifications and minor or moderate amendments. This is a state-only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. Stat. Section 116.07, subds. 4a & 9; Minn. R. 7009.0020; Minn. R. 7007.0100; Minn. R. 7007.0800, subp. 2
--	--

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 001 Melting and Refining**Associated Items:** EU 003 Electric Induction Furnace 1

EU 004 Electric Induction Furnace 2

EU 005 Electric Induction Furnace 3

EU 006 Electric Induction Furnace A

EU 007 Electric Induction Furnace B

EU 028 Inoculation

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot 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. This limit is applicable to each unit listed in GP001.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent opacity . This limit is applicable to each unit listed in GP001.	Minn. R. 7011.0715, subp. 1(B)
PRODUCTION LIMITS	hdr
<p>Material Usage: less than or equal to 15000 tons/year using 12-month Rolling Sum of material melted in the furnaces. This limit applies during the time that the wet cyclonic impingement plate scrubber (CE003) is in operation to control emissions from sand handling and shakeout.</p> <p>If CE003 is replaced with a fabric filter (CE017), the Material Usage shall be less than or equal to 19700 tons/year using 12-month Rolling Sum of material melted in the furnaces.</p> <p>During the first 11 months of operation of CE017 in replacement of CE003, the limits for each 12-month period are as follows:</p> <p>Month 1: 15932 tons Month 2: 15783 tons Month 3: 16175 tons Month 4: 16567 tons Month 5: 16958 tons Month 6: 17350 tons Month 7: 17742 tons Month 8: 18133 tons Month 9: 18525 tons Month 10: 189177 tons Month 11: 19308 tons</p>	To avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
Daily Recordkeeping: Each day, record the total quantity of materials melted.	To avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
Monthly Recordkeeping: By the 15th day of each month, calculate and record the total quantity of materials melted during the previous month, and the total quantity of materials melted during the previous 12 months (12-month rolling sum).	Minn. R. 7007.0800, subp. 4 and 5

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 002 Sand Handling**Associated Items:** EU 008 Pallet Line Sand Handling

EU 009 Flask Line Sand Handling

EU 010 Core Sand Handling (13 machines)

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot 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. This limit is applicable to each unit listed in GP002.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent opacity . This limit is applicable to each unit listed in GP002.	Minn. R. 7011.0715, subp. 1(B)
PRODUCTION LIMITS	hdr
Material Usage: less than or equal to 135000 tons/year using 12-month Rolling Sum of sand used. This limit applies during the time that the wet cyclonic impingement plate scrubber (CE003) is in operation to control emissions from sand handling and shakeout. If CE003 is replaced with a fabric filter (CE017), the Material Usage shall be less than or equal to 177300 tons/year using 12-month Rolling Sum of sand used. During the first 11 months of operation of CE017 in replacement of CE003, the limits for each 12-month period are as follows: Month 1: 138525 tons Month 2: 142050 tons Month 3: 145575 tons Month 4: 149100 tons Month 5: 152625 tons Month 6: 156150 tons Month 7: 159675 tons Month 8: 163200 tons Month 9: 166725 tons Month 10: 170250 tons Month 11: 173775 tons	To avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
Daily Recordkeeping: Each day, record the total quantity of sand used.	To avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
Monthly Recordkeeping: By the 15th day of each month, calculate and record the total quantity of sand used during the previous month, and the total quantity of sand used during the previous 12 months (12-month rolling sum).	Minn. R. 7007.0800, subp. 4 and 5
CONTROL REQUIREMENTS - See CE002 and CE003 or CE017	hdr
CALCULATIONS	hdr
Calculations: VOC(MIX) (used at GP007) By the 15th day of each month, calculate the quantity of VOC emitted during the process of mixing sand and binder and making molds or cores, using the following equation: $\text{VOC(MIX)} = (\text{CR1} \times \text{V1} \times \text{ER1} / 2000) + (\text{CR2} \times \text{V2} \times \text{ER2} / 2000) + \dots \text{etc.}$ where VOC(MIX) = the total VOC emissions generated by mixing sand and binder to make molds or cores during the previous month (tons) CR1, CR2, etc. = the quantity of catalyst and/or resin used in each binder formula (molds and cores) during the previous month (pounds) V1, V2, etc. = the individual VOC content of the catalyst and/or resin in each binder formula used during the previous month (weight percent) ER1, ER2, etc. = the evaporation rate of VOC for the catalyst or resin in each binder formula used during the previous month (percent) (See Note 1)	Minn. R. 7007.0800, subp. 4 and 5

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

<p>Calculations: IHAP(MIX) (used at GP007)</p> <p>By the 15th day of each month, calculate the quantity of each individual HAP emitted during the process of mixing sand and binder and making molds or cores, using the following equation:</p> $\text{IHAP(MIX)} = (\text{CR1} \times \text{H1} \times \text{ER1} / 2000) + (\text{CR2} \times \text{H2} \times \text{ER2} / 2000) + \dots \text{ etc.}$ <p>where</p> <p>IHAP(MIX) = the total emissions of the individual HAP generated by mixing sand and binder to make molds or cores during the previous month (tons)</p> <p>CR1, CR2, etc. = the quantity of catalyst and/or resin used in each binder formula (molds and cores) during the previous month (pounds)</p> <p>H1, H2, etc. = the individual HAP content of the catalyst and/or resin in each binder formula used during the previous month (individual HAP, weight percent)</p> <p>ER1, ER2, etc. = the evaporation rate of the individual HAP for the catalyst or resin in each binder formula used during the previous month (percent) (See Note 1)</p>	<p>Minn. R. 7007.0800, subp. 4 and 5</p>
<p>NOTE 1: Evaporation rates for individual HAPs from resins and catalysts shall be those cited in the May 6, 1996 MPCA document "Iron Foundry Emission Calculations Guidance" (relevant sections reproduced in Appendix C) or from manufacturer's data. If manufacturer's data is used, the Permittee shall keep a record of the data and all supporting documentation. Any changes to the evaporation rate shall be submitted to the MPCA with the annual compliance certification. If no evaporation rate data is available, an evaporation rate of 50% shall be assumed.</p> <p>The Permittee may propose to use a resin or catalyst-specific evaporation rate derived from MCPA approved performance tests. If approved by the MPCA, this resin or catalyst-specific evaporation rate shall be used.</p>	<p>Minn. R. 7007.0800, subp. 4 and 5</p>

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 003 Pouring/Casting/Cooling**Associated Items:** EU 015 Pallet Line Pouring & Cooling

EU 016 Flask Line Pouring & Cooling

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. This limit is applicable to each unit listed in GP003.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent opacity . This limit is applicable to each unit listed in GP003.	Minn. R. 7011.0715, subp. 1(B)

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 004 Shakeout**Associated Items:** EU 017 Pallet Line Mold Shakeout

EU 018 Flask Line Mold Shakeout

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot 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. This limit is applicable to each unit listed in GP004.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent opacity . This limit is applicable to each unit listed in GP004.	Minn. R. 7011.0715, subp. 1(B)
CONTROL REQUIREMENTS - See CE002 and CE003 or CE017	hdr

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 005 Grinding/Cutting Operations**Associated Items:** EU 029 South Swing Grinder

EU 030 East Cutoff Saw

EU 031 Center Cutoff Saw

EU 032 West Cutoff Saw

EU 033 Double Disc Grinder

EU 034 Surface Grinder

EU 035 Double Belt Sander

EU 036 #5 Bench Grinder

EU 037 #1 Bench Grinder

EU 038 #2 Bench Grinder

EU 039 #3 Bench Grinder

EU 040 NE Chipping Bench

EU 041 SE Chipping Bench

EU 042 North Swing Grinder

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot 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. This limit is applicable to each unit listed in GP005.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent opacity . This limit is applicable to each unit listed in GP005.	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. This limit is applicable to each unit listed in GP004.
CONTROL REQUIREMENTS - See GP009	hdr

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 006 Ovens and Furnaces

Associated Items: EU 001 Scrap Preheat Oven 1
EU 002 Scrap Preheat Oven 2
EU 011 Core Oven
EU 012 Core Tunnel Oven
EU 013 Core Baking (4 machines)
EU 025 Heat Treat Oven
EU 026 Annealing Furnace C

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot 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. This limit applies individually to each unit listed in GP006.	Minn. R. 7011.0610, subp. 1(A)(1)
Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity. This limit applies individually to each unit listed in GP006.	Minn. R. 7011.0610, subp. 1(A)(2)
OPERATING REQUIREMENTS	hdr
Fuels: Limited to natural gas or propane only	Minn. Stat. 116.07, subd. 4a
Recordkeeping: Record and maintain records of the amounts of each fuel combusted on a monthly basis. These records may consist of purchase records or receipts.	Minn. R. 7007.0800, subp. 4 and 5
CONTROL REQUIREMENTS - See CE001	hdr

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 007 Primary VOC/HAP Sources

Associated Items: EU 008 Pallet Line Sand Handling

EU 009 Flask Line Sand Handling

EU 010 Core Sand Handling (13 machines)

EU 014 Core Wash

EU 015 Pallet Line Pouring & Cooling

EU 016 Flask Line Pouring & Cooling

EU 017 Pallet Line Mold Shakeout

EU 018 Flask Line Mold Shakeout

What to do	Why to do it
EMISSION LIMITS	hdr
Volatile Organic Compounds: less than or equal to 94 tons/year using 12-month Rolling Sum , to be calculated as described in this permit by the 15th day of each month for the previous 12 month period. Calculations shall include all HAP emissions from the sources listed in GP007, except products of combustion.	To avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
HAPs - Total: less than or equal to 23 tons/year using 12-month Rolling Sum , to be calculated as described in this permit by the 15th day of each month for the previous 12 month period. Calculations shall include all HAP emissions from the sources listed in GP007, except products of combustion.	Title I Condition: To avoid classification as a major source under 40 CFR Section 63.2; to avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
HAP-Single: less than or equal to 8.1 tons/year using 12-month Rolling Sum , to be calculated as described in this permit by the 15th day of each month for the previous 12 month period. Calculations shall include all HAP emissions from the sources listed in GP007, except products of combustion.	Title I Condition: To avoid classification as a major source under 40 CFR Section 63.2; to avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
RECORDKEEPING	hdr
Daily Recordkeeping: Each day, record the quantity, VOC content, and HAP content of each HAP-containing material used.	Title I Condition: To avoid classification as a major source under 40 CFR Section 63.2; to avoid classification as a major source under 40 CFR Section 70.2 and Minn. R. 7007.0200, subp. 1
Monthly Recordkeeping: VOC and HAP Emissions By the 15th day of each month, the Permittee shall determine and record the following: 1. The quantity of each VOC and/or HAP containing material used during the previous month; 2. The VOC, individual HAP, and total HAP emissions for the previous month; and 3. The 12-month rolling sums of VOC, individual HAP, and total HAP emissions for the previous month.	Minn. R. 7007.0800, subp. 4 and 5
CALCULATIONS	hdr
Calculations: VOC Emissions Monthly VOC emissions shall be calculated as follows: $\text{VOC(T)} = \text{VOC(MIX)} + \text{VOC(PCS)} + \text{VOC(CW)}$ Where: VOC(T) = total VOC emissions for the previous month, in tons VOC(MIX) = VOC emissions from mixing the binder resins and catalysts with sand, in tons, calculated as shown at GP002 VOC(PCS) = VOC emissions from pouring, cooling, and shakeout, in tons, calculated as shown at GP008 VOC(CW) = VOC emissions from the core wash operation, in tons, calculated using a mass balance of the %VOC in the core wash and the quantity used, assuming all is emitted The 12-month rolling sum of VOC emissions shall be calculated by summing the values of VOC(T) from each of the previous 12 months.	Minn. R. 7007.0800, subp. 4 and 5

TABLE A: LIMITS AND OTHER REQUIREMENTS**A-12**

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

<p>Calculations: Single (Individual) HAP Emissions</p> <p>Monthly HAP emissions shall be calculated as follows for each individual HAP:</p> $\text{HAP(I)} = \text{IHAP(MIX)} + \text{IHAP(PCS)} + \text{IHAP(CW)}$ <p>Where:</p> <p>HAP(I) = total emissions of the individual HAP for the previous month, in tons</p> <p>IHAP(MIX) = emissions of the individual HAP from mixing the binder resins and catalysts with sand, in tons, calculated as shown at GP002</p> <p>IHAP(PCS) = emissions of the individual HAP from pouring, cooling, and shakeout, in tons, calculated as shown at GP008</p> <p>IHAP(CW) = emissions of the individual HAP from the core wash operation, in tons, calculated using a mass balance of the %HAP in the core wash and the quantity used, assuming all is emitted</p> <p>The 12-month rolling sum of each individual HAP shall be calculated by summing the values of HAP(I) for each individual HAP from each of the previous 12 months.</p>	<p>Minn. R. 7007.0800, subp. 4 and 5</p>
<p>Calculations: Total HAPs</p> <p>HAP(T) = the sum of the single/individual HAPs (HAP(I)) for the previous month</p> <p>Calculate the 12-month rolling sum of total HAPs by summing the values of HAP(T) calculated during each of the previous 12 months.</p>	<p>Minn. R. 7007.0800, subp. 4 and 5</p>

TABLE A: LIMITS AND OTHER REQUIREMENTS

A-13

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 008 Pouring/Casting/Cooling/Shakeout HAP/VOC Emissions**Associated Items:** EU 015 Pallet Line Pouring & Cooling

EU 016 Flask Line Pouring & Cooling

EU 017 Pallet Line Mold Shakeout

EU 018 Flask Line Mold Shakeout

What to do	Why to do it
CALCULATIONS	hdr
<p>Calculations: VOC(PCS) (used at GP007)</p> <p>By the 15th day of each month, calculate the quantity of VOC emitted during the processes of pouring/cooling and shakeout, using the following equation:</p> $\text{VOC(PCS)} = (B1 \times VE1 / 2000) + (B2 \times VE2 / 2000) + \dots \text{ etc.}$ <p>where VOC(PCS) = the total VOC emissions generated by pouring/cooling and shakeout during the previous month (tons) B1, B2, etc. = the total quantity of the "index" (resin, seacoal, etc.) for each individual binder used in molds during the previous month (pounds) VE1, VE2, etc. = the VOC emission factor for each individual binder used in molds during the previous month (pound/pound) (Assume VOC = total hydrocarbons) (See Note 2)</p>	Minn. R. 7007.0800, subp. 4 and 5
<p>Calculations: IHAP(PCS) (used at GP007)</p> <p>By the 15th day of each month, calculate the quantity of each individual HAP emitted during the processes of pouring/cooling and shakeout, using the following equation:</p> $\text{IHAP(PCS)} = (B1 \times HE1 / 2000) + (B2 \times HE2 / 2000) + \dots \text{ etc.}$ <p>where IHAP(PCS) = the total emissions of the individual HAP generated by pouring/cooling and shakeout during the previous month (tons) B1, B2, etc. = the quantity of each individual binder used in molds during the previous month (pounds) HE1, HE2, etc. = the emission factor for the individual HAP for each individual binder used in molds during the previous month (pound/pound) (See Note 2)</p>	Minn. R. 7007.0800, subp. 4 and 5
<p>NOTE 2: The emission factor for the particular pollutant shall be the emission factor for the appropriate binder from Appendix B (reproduced from the May 6, 1998 MPCA document "Iron Foundry Emission Calculations Guidance"). The Permittee shall keep records of the binders used, the quantity of the "index" referenced in Appendix B for the binder type, the corresponding emission factors, and all supporting documentation. Any changes to the emission factors used shall be submitted to the MPCA with the annual compliance certification.</p>	Minn. R. 7007.0800, subp. 4 and 5

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 009 Baghouses - Grinding/Cutting Operations**Associated Items:** CE 009 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

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

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

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

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

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

CE 015 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 016 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

What to do	Why to do it
The operation of the control equipment listed in GP009 is not necessary in order for the process and source to meet applicable emission limits. However, if the Permittee wishes to take credit for operation of this equipment for purposes of reporting actual emissions for the emission inventory, then the units must comply with the following requirements.	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
The Permittee shall operate and maintain the fabric filter at all times that any process equipment controlled by the fabric filter (listed below) is operating. CE009: EU029, EU042 CE010: EU030 CE011: EU031 CE012: EU032 CE013: EU033, EU034, EU035, EU036 CE014: EU037, EU038, EU039 CE015: EU040 CE016: EU041	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
The Permittee shall maintain each piece of control equipment according to the manufacturer's specification, shall conduct inspections, and maintain documentation of those actions as required by Minn. R. 7011.0075, subp. 2(A) to 2(I).	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Particulate Matter < 10 micron: greater than or equal to 99 percent collection efficiency	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
Visible Emissions: The Permittee shall check each fabric filter stack (listed below) for any visible emissions once each day of operation during daylight hours. During inclement weather, the Permittee shall read and record the pressure drop across each fabric filter, once each day of operation. CE009: SV029 CE010, CE011 and CE012: SV030 CE013: SV031 CE014: SV032 CE015 and CE016: SV033	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
The pressure drop ranges listed below apply unless or until 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.	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
CE009, CE010, CE011, and CE012 Pressure Drop: greater than or equal to 3 inches of water column and less than or equal to 7 inches of water column	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
CE013 Pressure Drop: greater than or equal to 3 inches of water column and less than or equal to 5 inches of water column	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
CE014 Pressure Drop: greater than or equal to 2 inches of water column and less than or equal to 4 inches of water column	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
CE015 and CE016 Pressure Drop: greater than or equal to 2 inches of water column and less than or equal to 5 inches of water column	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
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. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)

TABLE A: LIMITS AND OTHER REQUIREMENTS**A-15**

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit.	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
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. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
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. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
For each control device listed in GP009 that does not collect 100% of emissions generated (i.e., does not collect through a total enclosure), the Permittee shall maintain a copy of the hood evaluation on site, as well as an annual record of fan rotation speed, fan power draw, or face velocity of each hood, or other comparable air flow indication method.	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)
Submittal of Hood Certification: When the hood evaluations for the control equipment listed in GP009 are complete, the Permittee shall submit the Hood Certification (Form HE-01).	Minn. Stat. 116.07, subd. 4a; Equipment used under Minn. R. 7019.3020(G)

TABLE A: LIMITS AND OTHER REQUIREMENTS**A-16**

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 011 Shotblast Booths**Associated Items:** EU 019 Shot Blast Booth 1

EU 020 Shot Blast Booth 2

EU 021 Shot Blast Booth 3

What to do	Why to do it
EMISSION LIMITS	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot 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. This limit is applicable to each unit listed in GP011.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent opacity . This limit is applicable to each unit listed in GP011.	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. This limit is applicable to each unit listed in GP004.
CONTROL REQUIREMENTS - See GP012	hdr

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: GP 012 Baghouses - Shotblast Booths**Associated Items:** CE 004 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 005 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

What to do	Why to do it
The control equipment is considered listed control equipment under Minn. R. 7011.0060 to 7011.0080. The Permittee shall operate and maintain the fabric filter at all times that any process equipment controlled by the fabric filter (listed below) is operating. CE004: EU019, EU020 CE005: EU021	Minn. R. 7011.0065, subp. 2(A)
The Permittee shall maintain each piece of control equipment according to the manufacturer's specification, shall conduct inspections, and maintain documentation of those actions as required by Minn. R. 7011.0075, subp. 2(A) to 2(I).	Minn. R. 7011.0075, subp. 2
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Particulate Matter < 10 micron: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
Visible Emissions: The Permittee shall check each fabric filter stack (listed below) for any visible emissions once each day of operation during daylight hours. During inclement weather, the Permittee shall read and record the pressure drop across each fabric filter, once each day of operation. CE004: SV021 CE005: SV028	Minn. R. 7011.0080
The pressure drop ranges listed below apply unless or until 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.	Minn. R. 7011.0080
CE004 Pressure Drop: greater than or equal to 1 inches of water column and less than or equal to 6 inches of water column	Minn. R. 7011.0080
CE005 Pressure Drop: greater than or equal to 1 inches of water column and less than or equal to 4 inches of water column	Minn. R. 7011.0080
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. 7011.0075, subp. 3
Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit.	Minn. R. 7011.0080
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

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: CE 001 Fabric Filter - Low Temperature, i.e., T<180 Degrees F**Associated Items:** EU 001 Scrap Preheat Oven 1

EU 002 Scrap Preheat Oven 2

What to do	Why to do it
The control equipment is considered listed control equipment under Minn. R. 7011.0060 to 7011.0080. The Permittee shall operate and maintain the fabric filter at all times that any process equipment controlled by the fabric filter (listed above as "Associated Items") is operating.	Minn. R. 7011.0065, subp. 2(A)
The Permittee shall maintain each piece of control equipment according to the manufacturer's specification, shall conduct inspections, and maintain documentation of those actions as required by Minn. R. 7011.0075, subp. 2(A) to 2(I).	Minn. R. 7011.0075, subp. 2
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Particulate Matter < 10 micron: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for Total Particulate Matter: greater than or equal to 80 percent capture efficiency	Minn. R. 7011.0065, subp. 1(A)
Particulate Matter < 10 micron: greater than or equal to 80 percent capture efficiency The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for	Minn. R. 7011.0065, subp. 1(A)
Visible Emissions: The Permittee shall check the fabric filter stack (SV001) for any visible emissions once each day of operation during daylight hours. During inclement weather, the Permittee shall read and record the pressure drop across the fabric filter, once each day of operation.	Minn. R. 7011.0080
Pressure Drop: greater than or equal to 2 inches of water column and less than or equal to 6 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.	Minn. R. 7011.0080
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. 7011.0075, subp. 3
Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit.	Minn. R. 7011.0080
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
Hood Evaluation: For each of the "Associated Items" from which emissions are not 100% collected (i.e., not a total enclosure), the Permittee shall maintain a copy of the hood evaluation on site, as well as an annual record of fan rotation speed, fan power draw, or face velocity of each hood, or other comparable air flow indication method.	Minn. R. 7011.0070, subp. 3; Minn. R. 7011.0080

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: CE 002 Fabric Filter - Low Temperature, i.e., T<180 Degrees F**Associated Items:** EU 008 Pallet Line Sand Handling

EU 017 Pallet Line Mold Shakeout

What to do	Why to do it
The control equipment is considered listed control equipment under Minn. R. 7011.0060 to 7011.0080. The Permittee shall operate and maintain the fabric filter at all times that any process equipment controlled by the fabric filter (listed above as "Associated Items") is operating.	Minn. R. 7011.0065, subp. 2(A)
The Permittee shall maintain each piece of control equipment according to the manufacturer's specification, shall conduct inspections, and maintain documentation of those actions as required by Minn. R. 7011.0075, subp. 2(A) to 2(I).	Minn. R. 7011.0075, subp. 2
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Particulate Matter < 10 micron: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for Total Particulate Matter: greater than or equal to 80 percent capture efficiency	Minn. R. 7011.0065, subp. 1(A)
Particulate Matter < 10 micron: greater than or equal to 80 percent capture efficiency The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for	Minn. R. 7011.0065, subp. 1(A)
Visible Emissions: The Permittee shall check the fabric filter stack (SV007) for any visible emissions once each day of operation during daylight hours. During inclement weather, the Permittee shall read and record the pressure drop across the fabric filter, once each day of operation.	Minn. R. 7011.0080
Pressure Drop: greater than or equal to 3 inches of water column and less than or equal to 7 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.	Minn. R. 7011.0080
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. 7011.0075, subp. 3
Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit.	Minn. R. 7011.0080
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
Hood Evaluation: For each of the "Associated Items" from which emissions are not 100% collected (i.e., not a total enclosure), the Permittee shall maintain a copy of the hood evaluation on site, as well as an annual record of fan rotation speed, fan power draw, or face velocity of each hood, or other comparable air flow indication method.	Minn. R. 7011.0070, subp. 3; Minn. R. 7011.0080

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

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: CE 003 Wet Cyclonic Separator - Wet Cyclone**Associated Items:** EU 009 Flask Line Sand Handling

EU 010 Core Sand Handling (13 machines)

EU 018 Flask Line Mold Shakeout

What to do	Why to do it
The Permittee shall operate and maintain the scrubber at all times that any process equipment controlled by the scrubber (listed above as "Associated Items") is operating, except as follows. The Permittee may replace the scrubber with a fabric filter baghouse, designated as CE017 in this permit. When such a replacement is made and CE003 is removed from service, the requirements listed under CE017 supersede the requirements listed here.	Minn. R. 7007.0800, subp. 4, 5 and 14
The Permittee shall maintain each piece of control equipment according to the manufacturer's specification, shall conduct inspections, and maintain documentation of those actions as required by this permit.	Minn. R. 7007.0800, subp. 4, 5 and 14
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Total Particulate Matter: greater than or equal to 50 percent collection efficiency	Minn. R. 7007.0800, subp. 4, 5 and 14
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Particulate Matter < 10 micron: greater than or equal to 50 percent collection efficiency	Minn. R. 7007.0800, subp. 4, 5 and 14
The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for Total Particulate Matter: greater than or equal to 80 percent capture efficiency	Minn. R. 7007.0800, subp. 4, 5 and 14
The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for Particulate Matter < 10 micron: greater than or equal to 80 percent capture efficiency	Minn. R. 7007.0800, subp. 4, 5 and 14
Pressure Drop: greater than or equal to 3 inches of water column and less than or equal to 7 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.	Minn. R. 7007.0800, subp. 4, 5 and 14
Water flow rate: greater than or equal to 150 gallons/minute, 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.	Minn. R. 7007.0800, subp. 4, 5 and 14
Recordkeeping - Pressure Drop: The Permittee shall read and record the pressure drop across the scrubber, once each day of operation.	Minn. R. 7007.0800, subp. 4, 5 and 14
Recordkeeping - Water Flow Rate: The Permittee shall read and record the scrubber liquid flow rate once each day of operation.	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 and water flow rate as required by this permit. The monitoring equipment must be installed, in use, and properly maintained when the monitored equipment is in operation.	Minn. R. 7007.0800, subp. 4, 5 and 14
Periodic Inspections: At least once per calendar quarter, or more frequently as required by the manufacturing specifications, the Permittee shall inspect the control equipment components. The Permittee shall maintain a written record of these inspections.	Minn. R. 7007.0800, subp. 4, 5 and 14
Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur: - the water flow rate is outside the required operating range; or - the recorded pressure drop is outside the required operating range; or - the scrubber or any of its components are found during the inspections to need repair. Corrective actions shall return the pressure drop and/or water flow rate 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 scrubber. The Permittee shall keep a record of the type and date of any corrective action taken.	Minn. R. 7007.0800, subp. 4, 5, and 14
Hood Evaluation: For each of the "Associated Items" from which emissions are not 100% collected (i.e., not a total enclosure), the Permittee shall maintain a copy of the hood evaluation on site, as well as an annual record of fan rotation speed, fan power draw, or face velocity of each hood, or other comparable air flow indication method.	Minn. R. 7007.0800, subp. 4, 5 and 14

TABLE A: LIMITS AND OTHER REQUIREMENTS

A-21

07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

Subject Item: CE 017 Fabric Filter - to replace CE003

What to do	Why to do it
The control equipment is considered listed control equipment under Minn. R. 7011.0060 to 7011.0080. The Permittee shall operate and maintain the fabric filter at all times that any process equipment controlled by the fabric filter is operating.	Minn. R. 7011.0065, subp. 2(A)
The Permittee shall maintain each piece of control equipment according to the manufacturer's specification, shall conduct inspections, and maintain documentation of those actions as required by Minn. R. 7011.0075, subp. 2(A) to 2(I).	Minn. R. 7011.0075, subp. 2
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Total Particulate Matter: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a collection efficiency for Particulate Matter < 10 micron: greater than or equal to 99 percent collection efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for Total Particulate Matter: greater than or equal to 80 percent capture efficiency	Minn. R. 7011.0065, subp. 1(A)
The Permittee shall operate and maintain the control equipment such that it achieves a capture efficiency for Particulate Matter < 10 micron: greater than or equal to 80 percent capture efficiency	Minn. R. 7011.0065, subp. 1(A)
Visible Emissions: The Permittee shall check the fabric filter stack (SV008) for any visible emissions once each day of operation during daylight hours. During inclement weather, the Permittee shall read and record the pressure drop across the fabric filter, once each day of operation.	Minn. R. 7011.0080
Pressure Drop: greater than or equal to 2 inches of water column and less than or equal to 6 inches of water column, or as recommended by the manufacturer upon installation, 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.	Minn. R. 7011.0080
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. 7011.0075, subp. 3
Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit.	Minn. R. 7011.0080
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
Hood Evaluation: For each of the controlled units from which emissions are not 100% collected (i.e., not a total enclosure), the Permittee shall maintain a copy of the hood evaluation on site, as well as an annual record of fan rotation speed, fan power draw, or face velocity of each hood, or other comparable air flow indication method.	Minn. R. 7011.0070, subp. 3; Minn. R. 7011.0080

TABLE B: SUBMITTALS**B-1** 07/15/08

Facility Name: Northern Iron of St Paul LLC
Permit Number: 12300088 - 003

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

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

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

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

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:

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

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.

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

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

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

TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS

Facility Name: Northern Iron of St Paul LLC
Permit Number: 12300088 - 003

What to send	When to send	Portion of Facility Affected
Notification of the Actual Date of Initial Startup	due 15 days after Initial Startup of CE017 in replacement of CE003	CE017
Notification of the date of Equipment Removal/Dismantlement	due 15 days after Equipment Removal and/or Dismantlement	CE003

TABLE B: RECURRENT SUBMITTALS**B-3** 07/15/08

Facility Name: Northern Iron of St Paul LLC

Permit Number: 12300088 - 003

What to send	When to send	Portion of Facility Affected
Semiannual Deviations Report	due 30 days after end of each calendar half-year starting 01/31/2003 . The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occurred, the Permittee shall submit the report stating no deviations.	Total Facility
Compliance Certification	due 31 days after end of each calendar year starting 01/31/2003 (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 B: VOC and HAP Emission Factors for Pouring/Cooling/Shakeout**Facility Name:** Northern Iron and Machine**Permit Number:** 12300088-003

Tables B.1 through B.11 were taken from “Calculating Emission Factors for Pouring, Cooling and Shakeout.” This article was published in the October 1994 edition of Modern Casting which is a monthly publication of the American Foundrymen’s Society.

Table B.1. Phenolic Nobake Binder

Binder System	Pounds of Chemical
Phenolic Nobake	Released to Air per
Index: Resin	Pound of Index
Ammonia	0.000039
Hydrogen Sulfide	0.001462
Nitrogen Oxides	0.000029
Sulfur Dioxide	0.015107
Total Hydrocarbons	0.012159
Acrolein	0.000005
Benzene	0.011209
Formaldehyde	0.000010
Hydrogen Cyanide	0.000029
M-Xylene	0.000097
Naphthalene	0.000049
O-Xylene	0.000049
Phenol	0.000975
Toluene	0.000634
Total Aromatic Amines	0.000049
Total C ₂ to C ₅ Aldehydes	0.003070
Total HAPs ^[5]	0.016174

Table B.2. Phenolic Urethane Binder

Binder System	Pounds of Chemical
Phenolic Urethane	Released to Air per
Index: Resin	Pound of Index
Ammonia	0.000083
Hydrogen Sulfide	0.000057
Nitrogen Oxides	0.000044
Sulfur Dioxide	0.000061
Total Hydrocarbons	0.023377
Acrolein	0.000031
Benzene	0.005351
Formaldehyde	0.000022
Hydrogen Cyanide	0.001053
M-Xylene	0.000439
Naphthalene	0.000022
O-Xylene	0.000132
Phenol	0.003904
Toluene	0.000833
Total Aromatic Amines	0.000351
Total C ₂ to C ₅ Aldehydes	0.000219
Total HAPs	0.012355

Table B.3. Medium Nitrogen Furan TSA Catalyst Binder

Binder System	Pounds of Chemical
Medium Nitrogen Furan TSA Catalyst	Released to Air per
Index: Resin	Pound of Index
Ammonia	0.000202
Hydrogen Sulfide	0.000486
Nitrogen Oxides	0.000312
Sulfur Dioxide	0.004858
Total Hydrocarbons	0.017178
Acrolein	0.000016
Benzene	0.004534
Formaldehyde	0.000065
Hydrogen Cyanide	0.000607
M-Xylene	0.000243
Naphthalene	0.000040
O-Xylene	0.000040
Phenol	0.000101
Toluene	0.008826
Total Aromatic Amines	0.000364
Total C ₂ to C ₅ Aldehydes	0.017004
Total HAPs	0.031842

Table B.4. Phenolic Hotbox Binder

Binder System	Pounds of Chemical
Phenolic Hotbox	Released to Air per
Index: Resin	Pound of Index
Ammonia	0.010931
Hydrogen Sulfide	0.000009
Nitrogen Oxides	0.000638
Sulfur Dioxide	0.000036
Total Hydrocarbons	0.005165
Acrolein	0.000009
Benzene	0.001002
Formaldehyde	0.000006
Hydrogen Cyanide	0.001184
M-Xylene	0.000121
Naphthalene	0.000030
O-Xylene	0.000030
Phenol	0.000203
Toluene	0.000182
Total Aromatic Amines	0.001275
Total C ₂ to C ₅ Aldehydes	0.000273
Total HAPs	0.004318

Table B.5. Green Sand Binder

Binder System	Pounds of Chemical
Green Sand	Released to Air per
Index: Seacoal	Pound of Index
Ammonia	0.000065
Hydrogen Sulfide	0.000832
Nitrogen Oxides	0.000562
Sulfur Dioxide	0.000253
Total Hydrocarbons	0.011941
Acrolein	0.000002
Benzene	0.000611
Formaldehyde	0.000004
Hydrogen Cyanide	0.000118
M-Xylene	0.000021
Naphthalene	0.000021
O-Xylene	0.000021
Phenol	0.000131
Toluene	0.000063
Total Aromatic Amine	0.000021
Total C ₂ to C ₅ Aldehydes	0.000063
Total HAPs	0.001076

Table B.6. Core Oil Binder

Binder System	Pounds of Chemical
Core Oil	Released to Air per
Index: Core Oil	Pound of Index
Ammonia	0.000038
Hydrogen Sulfide	0.000057
Nitrogen Oxides	0.000081
Sulfur Dioxide	0.000115
Total Hydrocarbons	0.028737
Acrolein	0.000077
Benzene	0.002344
Formaldehyde	0.000096
Hydrogen Cyanide	0.000086
M-Xylene	0.000239
Naphthalene	0.000048
O-Xylene	0.000287
Phenol	0.000057
Toluene	0.000478
Total Aromatic Amines	0.000096
Total C ₂ to C ₅ Aldehydes	0.000766
Total HAPs	0.004574

Table B.7. Shell Binder

Binder System	Pounds of Chemical
Shell	Released to Air per
Index: Resin	Pound of Index
Ammonia	0.003860
Hydrogen Sulfide	0.000094
Nitrogen Oxides	0.000994
Sulfur Dioxide	0.003509
Total Hydrocarbons	0.022421
Acrolein	0.000047
Benzene	0.006667
Formadlehyde	0.000035
Hydrogen Cyanide	0.010526
M-Xylene	0.000585
Naphthalene	0.000058
O-Xylene	0.000117
Phenol	0.002456
Toluene	0.002807
Total Aromatic Amines	0.002339
Total C ₂ to C ₅ Aldehydes	0.000585
Total HAPs	0.026222

Table B.8. Low Nitrogen Furan Binder

Binder System	Pounds of Chemical
Low Nitrogen Furan	Released to Air per
Index: Resin	Pound of Index
Ammonia	0.000040
Hydrogen Sulfide	0.000405
Nitrogen Oxides	0.000012
Sulfur Dioxide	0.000607
Total Hydrocarbons	0.007814
Acrolein	0.000028
Benzene	0.000648
Formaldehyde	0.000267
Hydrogen Cyanide	0.000368
M-Xylene	0.002227
Naphthalene	0.000040
O-Xylene	0.000729
Phenol	0.000024
Toluene	0.000121
Total Aromatic Amines	0.000081
Total C ₂ to C ₅ Aldehydes	0.000243
Total HAPs	0.004777

Table B.9. Sodium Silicate-Ester Binder

Binder System	Pounds of Chemical
Sodium Silicate-Ester	Released to Air per
Index: Sugar + Ester	Pound of Index
Ammonia	0.000038
Hydrogen Sulfide	0.000197
Nitrogen Oxides	0.000028
Sulfur Dioxide	0.000244
Total Hydrocarbons	0.022782
Acrolein	0.000028
Benzene	0.001410
Formaldehyde	0.000169
Hydrogen Cyanide	0.000179
M-Xylene	0.000094
Naphthalene	0.000005
O-Xylene	0.000094
Phenol	0.000273
Toluene	0.000282
Total Aromatic Amines	0.000094
Total C ₂ to C ₅ Aldehydes	0.001316
Total HAPs	0.003943

Table B.10. Furan Hotbox Binder

Binder System	Pounds of Chemical
Furan Hotbox	Released to Air per
Index: Resin	Pound of Index
Ammonia	0.019579
Hydrogen Sulfide	0.000060
Nitrogen Oxides	0.000411
Sulfur Dioxide	0.000088
Total Hydrocarbons	0.006259
Acrolein	0.000013
Benzene	0.000537
Formaldehyde	0.000009
Hydrogen Cyanide	0.003474
M-Xylene	0.000032
Naphthalene	0.000032
O-Xylene	0.000032
Phenol	0.000016
Toluene	0.000032
Total Aromatic Amines	0.003032
Total C ₂ to C ₅ Aldehydes	0.000158
Total HAPs	0.007364

Table B.11. Alkyd Isocyanate Binder

Binder System	Pounds of Chemical
Alkyd Isocyanate	Released to Air per
Index: Resin + Isocyanate	Pound of Index
Ammonia	0.000037
Hydrogen Sulfide	0.000007
Nitrogen Oxides	0.000355
Sulfur Dioxide	0.000040
Total Hydrocarbons	0.035567
Acrolein	0.000088
Benzene	0.005336
Formaldehyde	0.000106
Hydrogen Cyanide	0.000175
M-Xylene	0.002522
Naphthalene	0.000037
O-Xylene	0.003838
Phenol	0.000110
Toluene	0.001535
Total Aromatic Amines	0.000037
Total C ₂ to C ₅ Aldehydes	0.002156
Total HAPs	0.015939

APPENDIX C: VOC and HAP Evaporation Rates for Sand/Resin/Catalyst Mixing**Facility Name:** Northern Iron and Machine**Permit Number:** 12300088-003

The following tables were taken from: "Form R Reporting of Binder Chemicals Used in Foundries," Second Edition (1998), published by the American Foundrymen's Society, Inc. and the Casting Industry Suppliers Association.

The information found for different types of binder systems can be used to calculate the amount of individual HAP's and total VOC's that are emitted when sand is mixed with binder, but before the mold or core is exposed to molten metal. In order to do this, the HAP content and VOC contents of each part of the binder system must be known, either from the material safety data sheet (MSDS), or the manufacturer.

Table C.1 Alkyd Oil Binder

	% Reacted	% Evaporated	% Remaining Mold/Core
Resin			
Lead (7439-92-1)	0	0	100
Cobalt (7440-48-4)	0	0	100
Coreactant			
Methylene Phenylene Isocyanate (101-68-8) ⁽¹⁾	99.99	<0.01	0.01
Polymeric diphenylmethane Diisocyanate (9016-87-9)	99.99	<0.01	0.01

⁽¹⁾ Listed as CAS #101-68-8, MBI, Methylenebis (phenyl, isocyanate) on 313 chemical list

Table C.2 Acrylic/Epoxy/SO₂ Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Part I			
Cumene Hydroperoxide (80-15-9)	97	0	3
Cumene (98-82-8)	0	1.5	98.5

Table C.3 Furan Hotbox Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Formaldehyde (50-00-0)	95	5	0

Table C.4 Furan Nobake Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Phenol (108-95-2)	98+	0	2
Formaldehyde (50-00-0)	98	2	0
Methyl Alcohol (67-56-1)	0	50	50
Catalyst			
Methyl Alcohol (67-56-1)	0	50	50
Sulfuric Acid (8774-93-9)	100	0	0

Table C.5 Furan/SO₂ Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Formaldehyde (50-00-0)	98	2	0
Methyl Alcohol (65-56-1)	0	50	50
Oxidizer			
Dimethyl Phthalate (131-11-3)	0	50	50
Methyl Ethyl Ketone (78-93-3)	0	50	50

Table C.6 Furan Warmbox Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Formaldehyde(50-00-0)	95	5	0
Catalyst			
Methyl Alcohol(67-56-1)	0	100	0

Table C.7 Phenolic Baking Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Part I			
Phenol (108-95-2)	95	0	5
Formaldehyde(50-00-0)	95	5	0

Table C.8 Phenolic Ester Nobake Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Formaldehyde (50-00-0)	98	2	0
Phenol (108-95-2)	98	0	2

Table C.9 Phenolic Ester Coldbox Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Formaldehyde (50-00-0)	98	2	0
Phenol (108-95-2)	98	0	2
Glycol Ethers ⁽¹⁾	0	50	50
Catalyst			
Methanol (67-56-1)	0	50	50

⁽¹⁾ Listed as Certain Glycol Ethers under (c) Chemical categories on the SARA 313 chemical list.

Table C.10 Phenolic Hotbox Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Formaldehyde (50-00-0)	95	5	0
Phenol (108-95-2)	95	0	5

Table C.11 Phenolic Nobake - Acid Catalyzed Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Resin			
Phenol (108-95-2)	98	0	2
Formaldehyde (50-00-0)	98	2	0
Methyl Alcohol (67-56-1)	0	50	50
Acid			
Methyl Alcohol (67-56-1)	0	50	50
Sulfuric Acid (7664-93-9)	100	0	0

Table C.12 Phenolic Novolac Flake Binder - Coating Operations

	% Reacted	% Evaporated	% Remaining in Mold/Core
Part I			
Phenol (108-95-2)	95	0	5
Part II			
Ammonia ⁽¹⁾ (7664-41-7)	0	100	0

⁽¹⁾ Ammonia is generated as a breakdown product from the hexamethylenetetramine (hexa). As the hexa breaks down 40% is converted to ammonia. The percentages listed here are for the ammonia generated from the hexa.

Table C.13 Phenolic Novolac Liquid Binder - Coating Operations

	% Reacted	% Evaporated	% Remaining in Mold/Core
Part I			
Phenol (108-95-2)	95	0	5
Formaldehyde (50-00-0)	95	5	0
Methanol (67-56-1)	0	100	0

Table C.14 Phenolic Urethane Nobake Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Part I			
Phenol (108-95-2)	98	0	2
Formaldehyde (50-00-0)	98	2	0
Naphthalene (91-20-3)	0	5.85	94.15
1,2,4 Trimethyl Benzene (95-63-6)	0	5.85	94.15
Cumene (98-82-8)	0	5.85	94.15
Xylene (1330-20-7)	0	5.85	94.15
Part II			
Methylene Phenylene Isocyanate ⁽¹⁾ (101-68-8)	99.99	0	0.01
Polymeric diphenylmethane Diisocyanate (9016-87-9)	99.99	0	0.01
Naphthalene (91-20-3)	0	5.85	94.15
1,2,4 Trimethylbenzene (95-63-6)	0	5.85	94.15
Cumene (98-82-8)	0	5.85	94.15
Xylene (1330-20-7)	0	5.85	94.15

⁽¹⁾ Listed as CAS #101-68-8, Methylenebis (phenylisocyanate)(MDI) under (c) Chemical categories on the SARA 313 chemical list.

Table C.15 Phenolic Urethane Coldbox Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Part I			
Formaldehyde (50-00-0)	98	2	0
Phenol (108-95-2)	98	0	2
Xylene (1330-20-7)	0	3.25	96.75
Cumene (98-82-8)	0	3.25	96.75
Naphthalene (91-20-3)	0	3.25	96.75
1,2,4 Trimethylbenzene (95-63-6)	0	3.25	96.75
Part II			
Methylene Phenylene Isocyanate (101-68-8) ⁽¹⁾	99.99	0	0.01
Polymeric diphenylmethane Diisocyanate (9016-87-9)	99.99	0	0.01
Naphthalene (91-20-3)	0	3.25	96.75
Xylene (1330-20-7)	0	3.25	96.75
Biphenyl (95-52-4)	0	3.25	96.75

⁽¹⁾ Listed as CAS #101-68-8, Methylenebis (phenylisocyanate)(MDI) under (c) Chemical categories on the SARA 313 chemical list.

Table C.16 Urea Formaldehyde Binder

	% Reacted	% Evaporated	% Remaining in Mold/Core
Part I			
Formaldehyde (50-00-0)	98	2	0

APPENDIX D: Insignificant Activities Required to be Listed**Facility Name:** Northern Iron and Machine**Permit Number:** 12300088-003**Insignificant Activities and Applicable Requirements**

Minn. R. 7007.1300, subpart	Rule Description of the Activity	Applicable Requirement
3(A)	Fuel use: space heaters fueled by, kerosene, natural gas, or propane.	Minn. R. 7011.0510/0515
3(G)	Emissions from a laboratory, as defined in the subpart.	Minn. R. 7011.0510/0515 + Minn. R. 7011.0610 + Minn. R. 7011.0710/0715
3(H)	Miscellaneous:	
	4. brazing, soldering or welding equipment;	Minn. R. 7011.0510/0515 + Minn. R. 7011.0610 + Minn. R. 7011.0710/0715
	5. blueprint copiers and photographic processes;	Minn. R. 7011.0105/0110
3(I)	Individual emissions units at a stationary source, each of which have a potential to emit the following pollutants in amounts less than: 1. 4,000 lbs/year of carbon monoxide; and 2. 2,000 lbs/year each of nitrogen oxide, sulfur dioxide, particulate matter, particulate matter less than ten microns, volatile organic compounds (including hazardous air pollutant-containing VOC), and ozone. • Three sand silos, each of which has emissions <1 tpy of PM/PM ₁₀	Minn. R. 7011.0710/0715
3(J)	Fugitive Emissions from roads and parking lots.	Minn. R. 7011.0150

TECHNICAL SUPPORT DOCUMENT
For
AIR EMISSION PERMIT NO. 12300088-003

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

1. General Information

1.1. Applicant and Stationary Source Location:

Applicant/Address	Stationary Source/Address (SIC Code: 3321)
Northern Iron of St. Paul, LLC 867 Forest St. St. Paul, MN 55106	Northern Iron & Machine 867 Forest St. St. Paul, Ramsey County
Contact: Thomas J. Zarnke Phone: 651-778-3339	

1.2. Description of the Facility

Northern Iron and Machine operates a gray and ductile iron foundry in St. Paul, Minnesota. The facility is subject to a 100 ton per year (tpy) major source threshold under New Source Review. The facility received a state permit (12300088-001), therefore conditions limiting Hazardous Air Pollutant (HAP) emissions to less than 10/25 tpy (individual/total HAPs) and limiting Particulate Matter less than 10 um in size (PM₁₀) and VOC emissions to less than 100 tpy were included in the permit. Total Particulate Matter (PM) was greater than 100 tpy, so the facility remains a major source under New Source Review, but since PM is not regulated under the Part 70 permit program, the facility received a federally enforceable state operating permit (12300088-001).

Emissions are primarily generated by sand handling operations for mold and core production and metal handling operations, including melting, casting, and finishing. Sand handling processes involve conveying, pneumatic transport, storage, mulling, and mixing of new silica sand and recycled foundry sand. Binder resins are mixed with this sand to make the molds and cores used at the facility. Certain cores are washed and baked prior to being placed in a mold. Purchased scrap steel is preheated in an oven prior to being melted in electric induction furnaces. Foundry returns and any necessary alloying elements are combined with the melted scrap to produce a molten iron charge. This charge is poured into a mold and allowed to cool before the casting is removed from the mold and core sand in the shakeout process. The iron castings are then cleaned and finished prior to being shipped as a final product. Finishing operations may include heat treating/annealing, shot blasting, and grinding.

1.3 Description of the Activities Allowed by this Permit Action

An administrative amendment application was received March 10, 2008 in accordance with Minn. R. 7007.1400, subp. 1(B)(E) that requested a change of facility name to Northern Iron & Machine (formerly Versa Iron & Machine) and the new owner/operator of the facility is Northern Iron of St. Paul, LLC (formerly Versa Companies). All references in GP009 to Minn. R. 7019.3020 (F) were changed to Minn. R. 7019.3020 (G) in the permit from a note dated March 28, 2005 from Toni Volkmeier. The recordkeeping citation per Minn. R. 7007.1200, subp. 4 was added to the permit. This facility has an existing National Ambient Air Quality Standards (NAAQS) issue stated in a letter dated June 21, 2005 to Mr. Doug Michaelson regarding annual and 24 hour PM₁₀ that needs to be resolved. The permittee decided to go forward with this amendment without resolving the NAAQS issue and thus, language was added to Table A and the permit shield stating that the NAAQS issue from 2005 remains unresolved as of the issuance of this amendment.

2. Conclusion

Based on the information provided by Northern Iron & Machine, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 12300088-003 and this technical support document, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Tarik Hanafy (permit writer/engineer)
 Christian Norman (enforcement)
 Toni Volkmeier (peer reviewer)

AQ File No. 1116; DQ 1945

Attachments: 1. Facility Description and CD-01 Forms