

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection**

B157736057

FACILITY: GREDE LLC - IRON MOUNTAIN		SRN / ID: B1577
LOCATION: 801 S CARPENTER AVE, KINGSFORD		DISTRICT: Grand Rapids
CITY: KINGSFORD		COUNTY: DICKINSON
CONTACT: Jack Bomberg , EHS Supervisor		ACTIVITY DATE: 08/12/2016
STAFF: Eric Grinstern	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Unannounced inspection		
RESOLVED COMPLAINTS:		

FACILITY DESCRIPTION

Grede LLC. – Iron Mountain, an MPG Company, is located in the city of Kingsford and produces gray iron castings used in industrial machinery, hydraulic valves, and agricultural equipment. The major production operations are raw material handling and preparation, mold and core production, metal melting, pouring, cooling and shakeout, and cast finishing.

The facility operates a cupola that is controlled with an afterburner for carbon monoxide control and a baghouse for particulate control. Other processes at the facility are controlled with air pollution control equipment including wet scrubbers, baghouses, cartridge filters, and acid scrubbers.

REGULATORY ANALYSIS

The facility is a Title V subject source (ROP No. MI-ROP-B1577-2014a) because the potential to emit criteria pollutants exceeds the major source threshold and because the facility's PTE for HAPs exceeds the major source threshold. The ROP was modified in June 2016 to account for a change in emission control for EU-P018 MAIN PLANT SHAKEOUT. The wet collector was replaced with two fabric filter baghouse. The permit was also modified to address an error associated with inverted stack heights in several emission units. The facility is subject to the Iron and Steel Foundry NESHAP, Subpart EEEEE. NESHAP subject emission units are EU-009 Cupola, EU-1.6 Main Plant Pouring and Cooling, EU-P036 Module Pouring and Cooling, and EU-P044 Ductile Iron Production Unit. The following emission units are subject to CAM requirements in the ROP: EU-P012 (PM), EU-P014 (PM), EU-P018 (PM) and EU-PO40 (PM).

The facility was issued a Violation Notice (VN) on September 23, 2015, addressing violations documented as part of an inspection conducted on July 20, 2015. To resolve those violations, Consent Order No. 23-2016 was signed June 22, 2016. In addition to placing enforceable requirements on the existing ROP conditions, the Consent Order required the facility to submit an updated PMP. The facility submitted the PMP on August 19, 2016.

COMPLIANCE EVALUATION

At the facility AQD staff consisting of Eric Grinstern met with Jack Bomberg, EHS Supervisor, Chuck Kalupa, General Manager, Adam Buchcusi, Plant Manager and Tom White, Maintenance.

SOURCE-WIDE CONDITIONS**Emission/Material Limits**

SOURCE-WIDE has limits that restricts the emission of PM10 and VOC on a facility-wide basis.

Compliance with the PM10 and VOC emission limits is demonstrated through compliance with the metal throughput limits, which correlate to compliance with the emission limits.

Review of facility records showed metal throughput to be below the permitted 12-month rolling limit (164,250 tpy). Records were provided documenting that the melt total was 40,330 tons. (September 2015-August 2016).

EU-P009 CUPOLA

Emission unit includes a WRIB Company Inc. 72 inch refractory lined, water wall, high efficiency cupola. The pollution control equipment includes afterburners, a quench tank, and a positive pressure baghouse. The cupola is subject to Subpart EEEEE.

Emission/Material Limits

EU-P009 has limits that restrict the emission of CO, PM, PM10 and SO2 from the cupola. Compliance with the emission limits is demonstrated through control equipment monitoring to demonstrate proper operation and compliance testing.

The most recent testing to demonstrate compliance with the emission limits was conducted in December 2013. Testing showed compliance with the emission limits.

The facility has a charge limit of 450 tons per day and 164,250 tons per 12-month period. Compliance is demonstrated via charge records. Facility records show compliance with the 12-month rolling time period limit, with the most recent 12-month charge amount being 40,330 tons. Review of melt logs for the period of January 1, 2016 through August 2016 showed the highest daily charge rate to be 305 tons, which is in compliance with the 450 ton per day limit.

Monitoring/Recordkeeping

The facility is required to maintain records of the following:

1. Number and weight of charges on a production day basis.
2. Records of the tons of metal charged on a 12-month rolling time period.
3. Hours of operations.
4. Record of CO, PM10 and SO2 emissions on a 12-month rolling time period.
5. Temperature of cupola off-gas.
6. Baghouse pressure drop.
7. Amperage of the emission control system fan on a continuous basis.

As requested, the facility provided copies of the above records for January 1, 2016 through August 2016.

As part of demonstrating proper operation of the baghouse, the permit requires the pressure drop to be monitored and recorded daily. The pressure drop must be within the range listed in the PMP, which is a differential of a minimum of 1.0 inch. The pressure drop of the baghouse controlling EU-P009 was 3.46 inches at the time of the inspection.

For the records reviewed, all pressure drop readings showed operation above the 1.0 inch minimum.

Proper operation of the afterburner is demonstrated through monitoring the temperature. The afterburner temperature must be maintained above a 15 minute average of 1300 degrees F, outside of the off-blast allowance time. The afterburner temperature at the time of the inspection was 1606 degrees F. For the records reviewed, all temperature readings were above the permit minimum of 1300 degrees. On January 19, 2016, the hand written reading appeared to be incomplete, likely from being photocopied. The facility supplied the entered data for that day, which showed a temperature of 1916 degrees.

Proper operation is also based upon the emission control fan amperage being within the range between 115 and 200 amperes. During the inspection the fan amperage was 161, which is within the established range for proper operation. For the records reviewed, all fan amperage readings were within the established range.

Under permit Conditions 13 &14, proper operation is no visible emissions from the baghouse, the observation of visible emissions would be considered an excursion under CAM in regards to compliance with the particulate matter. No VE was observed during the inspection, therefore, the baghouse is considered to be properly operating.

Testing/Sampling

The facility is required to test between 6 and 18 months prior to the expiration of the ROP.

The facility tested and demonstrated compliance with the ROP limits emission limits in December 2013.

Stack/Vent Restrictions

Visual evaluation of the stack (SV009-324644) showed that it appeared to meet the height requirement.

Inspection Observations:

Staff observed the cupola baghouse the morning of the inspection, prior to entering the facility. During this period of time, no opacity was observed. Staff also observed the baghouse throughout the inspection and did not observe any visible emissions. This is an improvement compared to the last inspection when VE was noted almost continuously to be emitted from the baghouse.

EU-P011 SHELL CORE

Emission unit represents the production of phenolic resin-baked (shell) cores. The cores are produced on 21 natural gas heated core machines. Emissions from the core machines are vented indoors, and subsequently the core area is vented by fans located on the roof.

Emission/Material Limits

EU-P011 has limits that restrict the emission of PM to 0.10 pounds per 1,000 pounds of exhaust gases. Compliance with the emission limit is based on proper operation of the core machines. Compliance can also be verified through emissions testing, which has not been required.

EU-P012 MAIN PLANT SAND SYSTEM

Process includes activities associated with collection and distribution of mold sand used in the Main Plant with the exception of the Sand Conditioning System. The Main Plant Sand System is controlled with a wet dust collector. Additionally, the Module sand heater/cooler are ducted to and controlled by the Main Plant Sand System wet dust collector. This is a CAM subject emission unit for PM.

Emission/Material Limits/Records

EU-P012 has limits that restrict the emission of PM and PM10. Compliance with the emission limits is demonstrated through control equipment (wet collector) monitoring to demonstrate proper operation.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the large wet collector, the permit requires daily monitoring and recording of the fan amperage and pressure drop. Additionally, proper operation is determined through daily visible emissions observations.

During the inspection the fan amp reading was 122, which is at the low end of the established (PMP) range (122-137).

During the inspection the pressure drop gauge read was slightly over 2.0". The pressure drop is required to be between 2.0 and 4.0 inches of pressure drop for proper operation.

	Pressure Drop (proper range)	Amp (proper range)
Large Wet coll.	2.0+ (2.0-4.0)	122 (122-137)

For the pressure drop and amperage records reviewed, all readings were within the established ranges, except for January 31, 2016. The amp reading on this date was 377. This appears to have been a typo, since the facility supplied the data collection entry showing an amp reading of 137.

Staff made observations of the large wet collector stack from the roof. No VE was noted during the inspection.

EU-P014 MAIN PLANT FINISHING

Process is defined as the collection of dust from all activities associated with metal finishing conducted in the Main Plant. These activities include grinding, chipping, and tumbling (Wheelabrators). The process exhaust is collected by three pulse-jet baghouses (Steelcraft, East Fuller, and West Fuller). This emission unit is subject to CAM for PM.

Emission/Material Limits

EU-P014 has limits that restrict the emission of PM and PM10. Compliance with the emission limits is demonstrated through control equipment (baghouses) monitoring to demonstrate proper operation.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the baghouses the permit requires daily monitoring and recording of the pressure drops and fan amps.

During the inspection the following values were observed:

	Pressure Drop	(proper range)	Amp	(proper range)
Steelcraft	5.5"	(3.5-5.5)	143	(145-160)
E. Fuller	6.5"	(5.0-7.0)	100(+)	(100-120)
W. Fuller	6.9"	(5.0-7.0)	130	(120-140)

For the pressure drop and amperage records reviewed, all readings were within the established range except for April 15, 16 and 18. On these dates the pressure drop reading was above 7.0. The facility reported this as a deviation and properly documented the cause and correction. On the day of the inspection, staff observed the amperage reading at 143 for the Steelcraft, while the facility records for the same day shows an amperage reading of 147. Due to variations in process operation and the timing of the amperage reading, the amperage likely fluctuates throughout the day.

During the inspection no VE was noted from any of the baghouse exhausts.

EU-P016 – MAIN PLAN POURING & COOLING

Process includes all activities associated with the pouring and cooling of molten iron on six mold lines in the Main Plant. There is no dust collection equipment associated with this emission unit

Emission/Material Limits

EU-P016 has limits that restrict the emission of PM10.

The emission unit is subject to Subpart EEEEE, PM limit. Compliance with the PM emission limit is demonstrated through emissions testing conducted in accordance with Subpart EEEEE in May 2012, at which time the facility demonstrated compliance without control.

EU-P018 MAIN PLANT SHAKEOUT

Castings, gates, risers, and sand are mechanically separated by shaking in the Main Plant. The shakeout receives the materials from the end of the dump conveyor. The Main Plant Shakeout process is controlled by the small wet collector which is being phased out and being replaced by two fabric filter units (Torit and Linsmeyer). This emission unit is subject CAM for PM. The day of the inspection the facility was still operating the small wet collector.

Emission/Material Limits

EU-P018 has limits that restrict the emission of PM and PM10. Compliance with the emission limits is demonstrated through control equipment monitoring to demonstrate proper operation.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the small wet collector the facility records the daily motor amperage and pressure drop.

Small Wet Coll			
Pressure Drop	(proper range)	Amp	(proper range)
3.5"	(3.0-6.0)	90.8	(87-102)

For the pressure drop and amperage records reviewed, all motor amperage readings were within the established range.

During the inspection no VE was noted from the exhaust of the small wet collector.

EU-P021 ISOCURE

Production of phenolic urethane coldbox (Isocure) cores in the Main Plant using dimethylethylamine (DMEA). The facility does not use triethylamine (TEA) in the Isocure processes. Sand and resin are mixed in three mullers prior to addition to core machines. The cores are produced on ten Isocure core machines. The Main Plant Isocure mullers, silo, and Kloster heater/cooler emissions are controlled by a baghouse. Emissions from the Main Plant Isocure core machines are controlled by a cartridge filter followed by an acid scrubber.

Emission/Material Limits/Records

EU-P021 has limits that restrict the emission of DMEA, PM, PM10 and VOC. Compliance with the emission limits is demonstrated through control equipment (baghouse, acid scrubber) monitoring to demonstrate proper operation and a material usage limit.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the acid scrubber, the permit requires monitoring and recording of the flow rate and pH once per shift. The facility maintains records of the pH and flow.

Readings at the time of the inspection:

	pH	(proper range)	Flow	(proper range)
Isocure Scrubber	1.88	(1.0-2.5)	105	(85-130)

For the pH and flow rate records reviewed, all readings were within the established ranges.

EU-P032 MODULE SAND SYSTEM

Process includes activities associated with the collection and distribution of mold sand used in the Module Plant. These activities include the Module Sand Muller, collection of spill sand, screening of used sand, and conveying sand. The Module Sand System is controlled by two wet dust collectors (East and West) which also serve Module Finishing, and Module Shakeout.

Emission/Material Limits

EU-P032 has limits that restrict the emission of PM and PM10. Compliance with the emission limits is

demonstrated through control equipment (wet collectors) monitoring to demonstrate proper operation.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the wet collectors the permit requires daily monitoring and recording of the pressure drop and amps.

Readings at the time of the inspection:

	Pressure Drop	(proper range)	Amp	(proper range)
East Wet coll.	4.5"	(3.0-5.0)	101	(100-130)
West Wet coll.	4.5"	(3.0-5.0)	125	(100-130)

For the pressure drop and amperage records reviewed, all motor amperage readings were within the established range, except for January 13, 2016. On this date the amperage reading was 137. The facility reported this as a deviation and properly documented the cause and correction.

Staff made observations of the wet collector stack from the roof. No VE was noted during the inspection.

The facility is looking at replacing the wet collectors with a Torit baghouse in the near future.

EU-P034 MODULE FINISHING

Process is defined as the collection of dust from all activities associated with metal finishing conducted in the Module Plant. These activities include grinding, chipping, and hang blast (Wheelabrators). The Module Finishing Process is controlled by the East and West wet collectors, which also serve the Module Sand System, and Module Shakeout.

Emission/Material Limits

EU-P034 has limits that restrict the emission of PM and PM10. Compliance with the emission limits is demonstrated through control equipment (wet collectors) monitoring to demonstrate proper operation.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the wet collectors the permit requires daily monitoring and recording of the pressure drop.

Readings at the time of the inspection:

	Pressure Drop	(proper range)	Amp	(proper range)
East Wet coll.	4.5"	(3.0-5.0)	101	(100-130)
West Wet coll.	4.5"	(3.0-5.0)	125	(100-130)

For the pressure drop and amperage records reviewed, all motor amperage readings were within the established range, except for January 13, 2016. On this date the amperage reading was 137. The facility reported this as a deviation and properly documented the cause and correction.

Staff made observations of the wet collector stack from the roof. No VE was noted during the inspection.

The facility is looking at replacing the wet collectors with a Torit baghouse in the near future.

EU-P036 – MODULE POURING AND COOLING

Process includes all activities associated with the pouring and cooling of molten iron on one Hunter mold line in the Module Plant. There is no dust collection equipment associated with this emission unit

Molten metal is supplied by the cupola.

Emission/Material Limits

EU-P036 has limits that restrict the emission PM10.

The PM limit is the pouring limit from Subpart EEEEE. Compliance with the PM emission limit is demonstrated through emissions testing conducted in accordance with Subpart EEEEE in May 2012, at which time the facility demonstrated compliance without control.

EU-P038 MODULE SHAKEOUT

Castings, gates, risers, and sand are mechanically separated by shaking in the Module Plant. The Module Shakeout process is controlled by two wet dust collectors, which also serve the Module Sand System and Module Finishing.

Emission/Material Limits

EU-P038 has limits that restrict the emission of PM and PM10. Compliance with the emission limits is demonstrated through control equipment (wet collectors) monitoring to demonstrate proper operation.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the wet collectors the permit requires daily monitoring and recording of the pressure drop.

Readings at the time of the inspection:

	Pressure Drop	(proper range)	Amp	(proper range)
East Wet coll.	4.5"	(3.0-5.0)	101	(100-130)
West Wet coll.	4.5"	(3.0-5.0)	125	(100-130)

For the pressure drop and amperage records reviewed, all motor amperage readings were within the established range, except for January 13, 2016. On this date the amperage reading was 137. The facility reported this as a deviation and properly documented the cause and correction.

Staff made observations of the wet collector stack from the roof. No VE was noted during the inspection.

The facility is looking at replacing the wet collectors with a Torit baghouse in the near future.

EU-P040 SAND CONDITIONING SYSTEM

Process represents the activities associated with the conditioning of mold sand used in the Main Plant. The process cools hot sand to approximately 120 degrees Fahrenheit or less while maintaining grain distribution and bond addition. A Steelcraft baghouse collects the emissions from all of the sand handling activities which include screening operations, storage silos, cooling and mixing, and the cyclone separator. This emission unit is subject CAM for PM.

Emission/Material Limits

EU-P040 has limits that restrict the emission of PM and PM10. Compliance with the emission limits is demonstrated through control equipment (baghouse) monitoring to demonstrate proper operation

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the baghouse, the permit requires daily monitoring and recording of the pressure drop and fan amperage.

Readings at the time of the inspection:

	Pressure Drop	(proper range)	Amp	(proper range)
Steelcraft	4.6"	(3.5-5.5)	125	(110-160)

For the pressure drop and amperage records reviewed, all motor amperage readings were within the established range, except for March 12, 2016. On this date the pressure drop reading was 10+. The facility reported this as a deviation and properly documented the cause and correction.

During the inspection no VE was noted from the exhaust of the collector.

EU-P041 MAIN PLANT BOND SILO

Process represents the loading of bond into the Main Plant Bond Silo, which is located external to the plant. The bond is used in the Main Plant. A Rumelin bin vent filter controls emissions generated during loading.

Emission/Material Limits

EU-P041 has limits that restrict the emission of PM (0.10 pounds per 1,000 pounds of exhaust gases). Compliance with the emission limits is demonstrated through proper operation of the control equipment (bin vent).

EU-P042 MODULE PLANT BOND SILO

Process represents the loading of bond into the Module Bond Silo. The bond is used in the Module Plant. A Flex Kleen bin vent filter controls emissions generated during loading.

Emission/Material Limits

EU-P042 has limits that restrict the emission of PM (0.10 pounds per 1,000 pounds of exhaust gases). Compliance with the emission limits is demonstrated through proper operation of the control equipment (bin vent).

EU-PO43 MODULE Isocure

Production of phenolic urethane cold box (Isocure) cores in the Module Plant using dimethylethylamine (DMEA). The facility does not use triethylamine (TEA) in the Isocure processes. Emissions from the Module Isocure process are controlled by a cartridge filter-acid scrubber system. The cores are produced on three core machines. Sand and resin are mixed in a muller prior to addition to core machines. Exhaust from the Module Isocure silos and Module sand heater/cooler is ducted to and controlled by the Main Plant Sand System wet dust collector

Emission/Material Limits/Records

EU-P043 has limits that restrict the emission of DMEA, PM, PM10 and VOC. Compliance with the emission limits is demonstrated through control equipment (baghouse, acid scrubber) monitoring to demonstrate proper operation and a material usage limit. Based on this inspection, parametric monitoring and proper control equipment operation and material usage demonstrate compliance with the emissions limits.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the acid scrubber, the permit requires monitoring and recording of the flow rate and pH once per shift. The facility maintains records of the pH and flow.

Readings at the time of the inspection:

	pH	(proper range)	Flow	(proper range)
Isocure Scrubber	1.7	(1.0-2.5)	31	(25-45)

For the pH and flow rate/PSI records reviewed, all readings were within the established ranges.

EU-PO44 DUCTILE IRON PRODUCTION UNIT

(Facility discontinued ductile operation on 8/18/2015, at this time they have no plans of restarting the process.)

Ductile Iron Production Unit consists of a charging system, two 6,000 lb. capacity electric melting furnaces, a ladle for inoculation, with the existing #7 HMP-20 mold machines and pouring/cooling lines utilized for molds and pouring and cooling. The emission unit is subject to the foundry NESHAP, Subpart EEEEE in regards to the furnace and pouring operations. The furnace emissions are controlled by a Torit cartridge collector that is equipped with a bag leak detection system. The emission unit is permitted to operate a charge preheater; however, one is currently not installed.

Emission/Material Limits

EU-P044 has limits the emission of PM10. Compliance with the emission limits is demonstrated through control equipment (cartridge collector) monitoring to demonstrate proper operation and compliance testing under the NESHAP.

The most recent furnace testing was conducted on December 2013.

The facility has a material Feed/Charge limit of 96 tons per day.

FGMACT-EEEEEE

The facility is subject to the Iron and Steel Foundry NESHAP, Subpart EEEEE. NESHAP subject emission units are EU-009 Cupola, EU-16 Main Plant Pouring and Cooling, EU-P036 Module Pouring and Cooling, and EU-P044 Ductile Iron Production Unit.

Summary of emission limits/restrictions applicable to each emission unit:

Each building or structure housing an iron foundry

20% fugitive opacity limit, facility is required to conduct testing semi-annually to demonstrate compliance. The facility has provided copies of the opacity tests conducted Badger Laboratories. The test reports show that no fugitive opacity was observed.

EU-009 CUPOLA

PM or Total Metal HAP Limit, VOHAP limit

Status: Facility tested and demonstrated compliance in May 2012

Scrap requirements: The facility has a scrap plan in place in accordance with Subpart EEEEE. The facility charges a considerable amount of auto frag. The facility continues to receive the auto frag from Schneider's Iron and Metal, located in Kingsford.

EU-P044 DUCTILE IRON

PM or Total Metal HAP Limit

Status: Facility tested and demonstrated compliance in December 2013

EU-P016 MAIN PLANT POURING AND COOLING

PM or Total Metal HAP Limit

Status: Facility tested and demonstrated compliance in May 2012

EU-P036 MODULE POURING AND COOLING

PM or Total Metal HAP Limit

Status: Facility tested and demonstrated compliance in May 2012

MISCELLANEOUS

Compliance testing for the ROP is required between March 26, 2018 and March 24, 2019. Compliance testing for Subpart EEEEE is required by May 2017. The facility previously discussed being able to conduct all of the testing at one time. As contained in the testing conditions, the facility can request and seek approval from the AQD District Supervisor for an alternative testing test schedule for testing required by the ROP.

During review of the facility records, staff noted that changes had been made to the recorded values. Staff discussed with Jack Bomberg that notation needs to be made as to the reason for the change of the recorded values.

As part of the facility's continued environmental monitoring improvement, staff observed that the facility had a large monitor with the instantaneous operating status of the air emission control equipment. The monitor is located at the entrance of the shop floor and also contains the established operating parameters for each control device.

COMPLIANCE STATUS

Based on this inspection, the facility appears to be in compliance with applicable air quality rules and regulations.

Overall the facility has shown a vast improvement in air quality compliance and monitoring compared to last year's inspection. The facility is also undertaking additional improvements to air pollution control equipment, monitoring and data collection.

NAME *[Handwritten Signature]*

DATE *9/20/16*

SUPERVISOR *[Handwritten Signature]*

