DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

B157764495

FACILITY: GREDE LLC - IRON MOUNTAIN		**SRN / ID:** B1577
LOCATION: 801 S CARPENTER AVE, KINGSFORD		**DISTRICT:** Marquette
CITY: KINGSFORD		**COUNTY:** DICKINSON
CONTACT: Adam Grunenwald , EHS Manager		**ACTIVITY DATE:** 08/02/2022
STAFF: Michael Conklin	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Targeted inspection for FY 22.		
RESOLVED COMPLAINTS:		

Facility: Grede, LLC – Iron Mountain (B1577)

Location: 801 South Carpenter Avenue, Kingsford, MI 49802

Contact(s): Adam Grunenwald, EHS Manager, 906-779-0244

Tom White, Lead Environmental Maintenance, 715-548-1095

Regulatory Authority

Under the Authority of Section 5526 of Part 55 of NREPA, the Department of Environment, Great Lakes, and Energy may upon the presentation of their card, and stating the authority and purpose of the investigation, enter and inspect any property at reasonable times for the purpose of investigating either an actual or suspected source of air pollution or ascertaining compliance or noncompliance with NREPA, Rules promulgated thereunder, and the federal Clean Air Act.

Facility Description

Grede, LLC – Iron Mountain (Grede) is a gray iron foundry located in Kingsford, MI. The company produces specialty iron castings used for industrial machinery and agricultural equipment. Grede operates a main foundry and a module foundry in the same building. A single WRIB Company cupola provides all the molten iron used by the main and module foundry.

Process Description

Production operations include raw material handling and preparation, mold and core production, metal melting, pouring, cooling, and casting finishing. The metal melting process begins with bulk raw materials received in the charge yard, which are used to make up the charge. Raw materials include scrap steel, pig iron, coke, and limestone. A predetermined amount of metal, coke, and limestone are added into a bucket that is elevated up to the cupola. Iron is melted by the burning of a coke bed and flows down the cupola. The flux combines with nonmetallic impurities in the iron to form slag. Molten iron and slag are removed at the bottom of the cupola. The molten iron is tapped into an electric induction holding furnace. From the holding furnace, the molten iron is

poured into ladles that are transported back to pouring stations. The molten iron is poured from ladles into the molds to create desired castings. The castings are then cooled and transported to the shakeout line, where the mold and core sand are shaken loose from the casting. The castings then proceed to finishing where they undergo chipping, grinding, shot blasting (Wheelabrators), and final quality inspections before being packaged and shipped to customers.

The production and assembly of molds and cores are the other main processes at the facility. For the production of phenolic urethane coldbox (Isocure) cores, sand and resin are mixed in mullers prior to being dispensed to the ten Isocure core machines. For the production of phonolic resin (shell) cores, the sand and resin are pre-mixed and dispensed to 21 natural gas heated core machines. The cores are then transported to one of seven mold lines where they are used to make the molds for casting. Used sand from casting shakeout is recycled and reused to make new molds.

Emissions Reporting

Grede is required to report its annual emissions to the Michigan Air Emissions Reporting System (MAERS). For 2021, the source reported the following total emissions as summarized in the table below.

Pollutant	Amount (lbs)
CO	1,703
Lead	1
NOx	7,631
PM10, Filterable	22,246
PM2.5, Filterable	5,126
SO2	4,618
VOC	49,144

Compliance History

Since the last inspection on 6/21/2021, the facility has received two VN's. The 7/15/2021 VN was a result of violations observed/reviewed from the 6/21/2021 inspection and the 12/17/2021 VN was from a complaint investigation regarding fallout that occurred on 9/28/2021. Both the 7/15/2021 and 12/17/2021 VN's have been considered resolved. Grede has raised the stack heights of the East Fuller, West Fuller, and Linsmeyer baghouses; leaks from the cupola exhaust duct and baghouse have been addressed; the facility is now certifying complaince with 40 CFR Part 63, Subpart EEEEE semiannually with the ROP complaince reports; and an updated Operation and Maintenance Plan has been submitted and AQD approved. Grede has also performed significant maintenance on the Steelcraft baghouse, for EU-P014 Main Plan Finishing, which was believed to be the source of previous fallout events. There have been no fallout complaints or visible emission events from the Steelcraft baghouse since the 9/26/2021 complaint. Th cupola was retested on December 21-22, 2021 for PM10. The test was conducted in a satisfactory manner and the emission rates passed with an average result of 1.01 lb/hr, which is in complaince with the 1.30 lb/hr limit.

Regulatory Analysis

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR) Part 70, because the potential to emit of volatile organic compounds exceeds 100 tons per year and the potential to emit of any single HAP regulated by Section 112 of the federal Clean Air Act, is equal to or more than 10 tons per year and/or the potential to emit of all HAPs combined is equal to or more than 25 tons per year. EU-P009 CUPOLA, EU-P016 MAIN PLANT POURING AND COOLING and EU-P036 MODULE POURING AND COOLING at the stationary source are subject to the Maximum Achievable Control Technology Standards for Iron and Steel Foundries promulgated in 40 CFR Part 63, Subparts A and EEEEE. Grede is currently subject to MI-ROP-B577-2020 and PTI No. 28-22.

Inspection

An on-site inspection was performed at Grede on 08/02/2022 to determine compliance with ROP No. MI-ROP-B577-2020, PTI No. 28-22, and Consent Order No. AQD 2021-01, and all other applicable Michigan Air Pollution Control Rules and federal regulations. The facility representatives included Tom White and Adam Grunenwald. The inspection began with having a meeting to discuss the inspection plan and any changes/updates to the facility. After the discussion, a tour of the plant proceeded to inspect the emission units outlined in the ROP and PTI.

<u>EU-P009 Cupola</u>

This emission unit includes a WRIB Company 72-inch refractory lined, water wall, high efficiency cupola. The cupola has a maximum melt rate of 20 tph. Natural gas is used for lighting coke and

the coke is used to maintain melting temperature in the cupola. Pollution control equipment includes four natural gas-fired afterburners for VOC, CO, and HAPs, a low efficiency scrubber (quench tank) for SO2, and a Hartzell Engineering Corporation positive pressure baghouse for PM. This emission unit is subject to 40 CFR Part 63, Subpart EEEEE.

Emission/Material Limits

The cupola contains emission limits for CO, PM, PM10, SO2, and visible emissions (VE). Compliance with the emission limits is demonstrated through control equipment monitoring and performance testing.

The cupola contains a charge limit of 450 tons per day and 164,250 tons per year. Compliance with these limits is demonstrated through melt logs.

Process/Operational Restriction(s)

Grede maintains an Operations & Maintenance Plan (Rev. 12/15/2021) for the cupola and associated control equipment. The revised plan includes identification of supervisory personnel responsible for overseeing inspection and maintenance; monthly, weekly, and daily inspection items for the equipment that is important to the performance of the total capture system, and a description of corrective procedures that are taken in the event of a malfunction. The facility is required to continuously monitor and maintain the proper operation of the afterburners, quench tank, and baghouse for the cupola. Performance monitoring parameters with ranges of proper operation and observed data from control room, during the inspection, are outlined in the table below.

Parameter	Range	Observed (9:55 AM CST)
Baghouse fan	115 – 281 Amps	140 Amps
Baghouse d.p.	1.0 in WC minimum	5.8 in WC
Afterburner temperature	1300 degrees F minimum	1568 degrees F

Data was collected from the cupola control room while the cupola was in "on-blast" status. The blast rate was 6,055 scfm and the charge rate was 16.25 ton/hr (13 charges per hour). The current routine maximum charge rate is 15 charges per hour (18.75 ton/hr). The afterburners, quench

tank, totally enclosed treatment system and positive pressure baghouse were installed and appeared to be operating properly based on the operating parameters and equipment observed.

After collecting performance parameters, AQD and Grede staff proceeded to the roof of the facility to inspect the cupola housing, cupola stack, and baghouse for visible emissions. No visible emissions were observed.

Testing/Sampling

Performance testing was conducted for compliance with the CO, PM, PM10, SO2, VOHAP, and VE emission limits in December 2020. The cupola passed for all emission limits except PM10. A VN was issued on 2/19/2021 for the failed stack test. Grede retested for PM10 in December 2021 and passed with an average emission rate of 1.01 pph. Testing against these emission limits is next required by December 2025.

Monitoring/Recordkeeping

Grede records the number and weight of charges added to the cupola on a production day basis. The facility maintains a melt log that notes the date, minutes the cupola was operating, number of charges added to the cupola, total tons of charges, average ton/hour of charge, and cupola downtime minutes. Grede uses an average 1.25 ton/charge multiplier to factor the weight of each charge. For the period January – July 2022, the average charge rate to the cupola was between 13-15 ton/hr and the total amount of charges melted was 18,998 charges (23,748 tons). Grede also maintains a 12-month rolling sum of the amount of charges melted in the cupola. For the period 01/01/2021 through 12/31/2021, the 12-month rolling sum was 32,129 tons. The facility is staying well below its melt limit of 164,250 tpy based on the records reviewed. Grede has only been operating on one shift per day, where historically they would run up to three shifts per day. This has caused a decrease in the amount charged compared to in the past.

Grede is required to continuously monitor and record the baghouse differential pressure, afterburner temperature, and baghouse fan amperage as part of the compliance assurance monitoring (CAM) plan. These operating parameters are continuously monitored from the cupola control system in the melt room of the plant. In addition, the facility is required to monitor and record visible emissions observations from the baghouse on a daily basis. Compliance with these required records were verified by requesting daily records for the dates 9/13/2021, 2/7/2022, and 4/27/2022. The records provided and reviewed indicate the baghouse fan amperage was between 115-280 amps, the differential pressure across the baghouse was greater than 1 in WC, stack temperature was greater than 1300 degrees F, and no visible emissions were detected from the cupola.

As part of the O & M Plan, Grede keeps records of preventive maintenance (PM) performed on the cupola and control equipment. Records of weekly PM's conducted on the Cupola baghouse and blower were requested for the weeks 2/20/2022 and 5/8/2022. Records were provided for the dates 2/26/2022 and 5/12/2022 that note the items inspected, if they were in okay condition, or if a work order was submitted with a description of issues found. A record of the monthly PM's conducted on the Cupola, baghouse, blower and quencher was requested for April 2022. Monthly PM records were provided that note the items inspected and the condition.

Grede is required to calculate and maintain records of CO, PM10 and SO2 emission rates on a 12-month rolling time period. The facility is required to use emission factors derived from the most recent stack test. Spreadsheets were provided that show the monthly amount of material melted, 12-month rolling total of material melted, and 12-month rolling total of CO, SO2, and PM10 emissions from the cupola. Taking the lb/hr stack test result and ton/hr melt rate during the test, the facility calculates a lb/ton emission factor for these pollutants. A review of these records shows the 12-month rolling emission rates of SO2, CO, and PM10 to be below the emission limits. For the period July 2021 through June 2022, the CO emissions were 0.883 tons, PM10 was 1.066 tons, and SO2 was 1.695 tons. The facility is using the December 2020 stack test emission factors for CO and SO2, and the December 2021 stack test emission factor for PM10 in calculating the emissions rates.

Reporting

A review of the 2021 annual compliance and deviation reports show 5 deviations reported for EU-P009 Cupola. Four of the five deviations reported were of opening the cupola cap due to malfunctions. The duration of these incidents reported were less than 10 minutes. The other deviation was the cupola baghouse blower expansion joint had visible emissions. Reason for deviations and corrective actions were provided.

The afterburners and baghouse are CAM subject control devices. The afterburners control CO emissions while the baghouse controls particulates. A review of the 2021 CAM Excursion/Exceedance and Monitor Downtime reports indicate the cupola had two excursions for the baghouse due to the cap having to be opened and bypassing the baghouse. These CAM exceedances are the same deviations reported on the 2021 compliance report.

Stack/Vent Restriction(s)

The baghouse was inspected for visible emissions, proper operation, and overall condition. No visible emissions were observed from the main exhaust duct to the baghouse, the blower, or the baghouse. The facility is currently updating the exterior of the baghouse. New sheet metal was observed on the exterior structure, replacing panels that were observed detaching during the

inspection in June 2021. Grede staff stated the plans are to replace the entire exterior with new sheet metal to improve the overall condition of the baghouse.

EU-P011 Shell Core

This process represents the production of phenolic resin (shell) cores. The cores are produced on 10 natural gas heated core machines. Emissions from the core machines are vented into the plant, and subsequently the core area is vented by fans located on the roof. The sand used is pre-coated with a resin prior to purchase; therefore, no mixing of sand and resin is required.

Emission/Material Limits

The shell core process contains an emission limit for PM that is practically enforceable through proper operation and maintenance of equipment and emissions testing if requested.

Testing/Sampling

Testing has not been required for this emission unit.

Stack/Vent Restrictions

The shell core process is vented through three ceiling vents that act as general ventilation for the process. During the inspection, the vent fans were on and appeared to be ventilating properly.

EU-P012 Main Plant Sand System

Process includes activities associated with collection and distribution of mold sand used in the Main Plant. The Main Plant Sand System is controlled by the Large Wet Dust Collector.

Emission/Material Limits

The Main Plant Sand System contains PM and PM10 emission limits that are made practically enforceable through proper operation and maintenance of the Large Wet Dust Collector, monitoring of pressure drop, fan amperage, visible emissions, and emissions testing if requested.

Process/Operational Restrictions

Grede maintains an O & M Plan (Rev. 12/15/2021) for the Main Plant Sand System and associated control equipment. The facility is required to continuously monitor and maintain the proper

operation of the Large Wet Dust Collector. Performance monitoring parameters with ranges of proper operation and observed data from control panel, during the inspection, are outlined in the table below.

Parameter	Range	Observed (10:02 AM CST)
Fan motor	122 – 137 Amps	136 Amps
Differential Pressure	2.0 – 4.0 in. WC	2.8 in WC

Design/Equipment Parameters

The Large Wet Dust Collector is equipped with a differential pressure gauge. This was observed on-site.

Testing/Sampling

Verification of PM and PM10 emission rates from the Main Plant Sand System has not been requested.

Monitoring/Recordkeeping

Grede is required to continuously monitor and record the Large Wet Dust Collector differential pressure and fan amperage as part of the Compliance Assurance Monitoring (CAM) plan. These operating parameters are continuously monitored from a control panel. In addition, the facility is required to monitor and record visible emissions observations from the Large Wet Dust Collector on a daily basis. Compliance with these required records were verified by requesting daily records for the dates 9/13/2021, 2/7/2022, and 4/27/2022. The records provided and reviewed indicate the fan amperage was between 122-137 amps, the differential pressure across the baghouse was between 2.0 – 4.0 in WC, and no visible emissions were detected from the stack of the Large Wet Dust Collector.

As part of the O & M Plan, Grede keeps records of preventive maintenance (PM) performed on the Large Wet Dust Collector. A monthly PM record was provided for the date 5/14/2022. The record notes the items inspected, the condition, and if a work order was needed. Grede appears to be maintaining the Large Wet Dust Collector according to the O & M Plan.

Grede is required to maintain records of PM10 emissions from the Main Plant Sand System on a 12-month rolling time period. For PM10 calculations, the facility is using a stack test emission factor. Using the PM10 emission rate from the 2005 stack test and the 12-month rolling sand throughput, the facility calculates PM10 emissions on a 12-month rolling basis. For the period July 2021 through June 2022, PM10 emissions were 0.564 tons.

Reporting

A review of the 2021 compliance and deviation reports indicate there were no deviations reported, along with no CAM monitor downtimes or exceedances for the Main Plant Sand System.

Stack/Vent Restrictions

After collecting the monitoring parameters data, AQD and Grede staff proceeded to the roof of the facility to inspect the wet collector and stack. At the time of the inspection, the wet collector was operating and no visible emissions were observed.

<u>EU-P014 Main Plant Finishing</u>

This emission unit include all activities associated with casting finishing conducted in the Main Plant. These processes include grinding, chipping, and tumble blasting (Wheelabrators). The process exhaust is collected by three pulse-jet baghouses: East Fuller, West Fuller, and Steelcraft.

Emission/Material Limits

The Main Plant Finishing contains PM and PM10 emission limits that are made practically enforceable through proper operation and maintenance of the three baghouses, monitoring of pressure drop across each baghouse, monitoring fan amperage for each baghouse, monitoring of visible emissions from each baghouse, and emissions testing if requested.

Process/Operational Restrictions

Grede maintains an O & M Plan (Rev. 12/15/2021) for the Main Plant Finishing and associated control equipment. The facility is required to continuously monitor and maintain the proper operation of each baghouse for Main Plant Finishing. Performance monitoring parameters with ranges of proper operation and observed data from control panels during the inspection are outlined in the table below.

Parameter	Range	Observed (10:54 AM CST)
Steelcraft baghouse fan	145 – 165 Amps	148 Amps
Steelcraft baghouse d.p.	3.5 – 5.5 in WC minimum	4.8 in WC

Parameter	Range	Observed (10:48 AM CST)
East Fuller baghouse fan	100 – 120 Amps	118 Amps
East Fuller baghouse d.p.	5.0 – 7.0 in WC minimum	6.8 in WC

Parameter	Range	Observed (10:48 AM CST)
West Fuller baghouse fan	120 – 140 Amps	125 Amps
West Fuller baghouse d.p.	5.0 – 7.0 in WC minimum	6.4 in WC

During the inspection, Grede staff stated there has been significant maintenance performed on the Steelcraft baghouse, which was previously believed to be a source of fallout/discharge events. Since the improvements made, no visible emission events have occurred from the Steelcraft baghouse.

Testing/Sampling

Verification of PM and PM10 emission rates from the Main Plant Finishing has not been requested.

Monitoring/Recordkeeping

Grede is required to continuously monitor and record the differential pressure and fan amperage from the East Fuller, West Fuller, and Steelcraft baghouses as part of the Compliance Assurance Monitoring (CAM) plan. These operating parameters are continuously monitored from control

panels that display the current fan amperage and differential pressure. In addition, the facility is required to monitor and record visible emissions observations from each of the three baghouses on a daily basis. Compliance with these required records were verified by requesting daily records for the dates 9/13/2021, 2/7/2022, and 4/27/2022. The records provided and reviewed indicate all operating parameters were within the respected ranges for proper operation.

As part of the O & M Plan, Grede keeps records of preventive maintenance (PM) performed on the Steelcraft, West Fuller, and East Fuller baghouses. Monthly PM records were provided for March 2022. The records note the items inspected, the condition, and if a work order was needed. Based on the records reviewed and observations on-site, Grede appears to be maintaining the finishing baghouses according to the O & M Plan.

Grede is required to maintain records of PM10 emissions from the Main Plant Finishing on a 12-month rolling time period. For PM10 calculations, the facility is using a PM10 MAERS emission factor and control efficiency of 99% for the baghouses. For the period July 2021 through June 2022, PM10 emissions were 0.157 tons.

Stack/Vent Restrictions

After collecting the monitoring parameters data, AQD and Grede staff proceeded outside of the facility to inspect the Steelcraft, West Fuller, and East Fuller for visible emissions. At the time of the inspection, all three baghouses were in operation and no visible emissions were observed. The East and West Fuller baghouse stacks have been raised to meet the minimum height requirement of 27 ft.

<u>EU-P016 Main Plant Pouring and Cooling</u>

Process includes all activities associated with the pouring and cooling of molten iron on six mold lines in the Main Plant. Molten iron is supplied by a 20-ton Brown Boveri holding furnace that receives molten iron from the cupola. There is no emission control equipment associated with this emission unit.

Emission/Material Limits

Main Plant Pouring and Cooling is subject to PM10 emission limits. These limits are practically enforceable through proper operation and maintenance, emission calculations, and emissions testing if requested.

Process/Operational Restrictions

At the time of the inspection, 5 of 6 mold lines were in operation and appeared to be operating properly. No changes to the mold lines have occurred since the last inspection.

Testing/Sampling

Testing has not been requested for verification of PM10 emission rates from Main Plant Pouring and Cooling.

Monitoring/Recordkeeping

Grede is required to maintain records of PM10 emissions from the Main Plant Pouring and Cooling on a 12-month rolling time period. For PM10 calculations, the facility is using a PM (Filterable) stack test emission factor from the December 2020 stack test and taking the ratio of PM10 to PM emission factors from the DEQ Foundry Factsheet (11/05) to calculate a PM10 emission factor for Main Plant Pouring and Cooling. For the period July 2021 through May June 2022, PM10 emissions were 0.6410 tons.

Stack/Vent Restrictions

The ROP currently has listed stacks 324176, 324188, 324196, and 324204 for Main Plant Pouring and Cooling. These stacks were previously part of the "Summit" cooling line. Modifications to these stacks were completed in 2019, where the connecting hoods and duct work were removed at the roofline rendering the stacks to becoming general ventilation. These stacks are for general ventilation only and are not capturing emissions from the Main Plant Pouring and Cooling processes any longer. For MACT EEEEE compliance, these stacks are not applicable since the modifications have rendered the stacks to being general building ventilation and are not discharging emissions to the atmosphere through conveyance. These stacks have been removed from EU-P016 Main Plant Pouring and Cooling through PTI No. 28-22.

The following table summarizes the stacks/vents observed as part of the Main Plant Pouring and Cooling.

Stack/Vent	Description
324636	Stack associated with Hunter No.5 cooling conveyor
324632	Stack associated with Hunter No.6 pouring

324662	**Stack associated with Hunter No.7 pouring**
324678	**Stack associated with Disa Forma pouring**
324682	**Stack associated with Disa Forma pouring**
324484	**Stack associated with Disa Forma cooling**
324848	**Stack associated with Hunter No. 5 pouring**
324666	**Stack associated with Hunter No. 7 cooling**
324844	**Not currently listed in the ROP. This stack is associated with the No.5 cooling conveyor.**

Each of these stack outlets were observed from the roof of the facility during the inspection. No visible emissions were detected. The table below lists the stacks/vents that were removed from Main Plant Pouring and Cooling through PTI No. 28-22.

Stack/Vent	Description
324308	**Stack associated with the shake cooling conveyor. Moved to Main Plant Shakeout.**
324176	**General ventilation, flush with roofline.**
324188	**General ventilation, flush with roofline**
324196	**General ventilation, flush with roofline**
324204	**General ventilation, flush with roofline**
324452	**General ventilation, flush with roofline, no conveyance. This use to be part of Hunter No. 8 cooling.**

324476	**This stack is associated with the Disa Forma line but does not vent pouring or cooling emissions**
324304	**Stack associated with the shake cooling conveyor. Moved to Main Plant Shakeout.**
324312	**Stack associated with the shake cooling conveyor. Moved to Main Plant Shakeout.**
324640	**Stack associated with the shake cooling conveyor. Moved to Main Plant Shakeout.**
324296	**Stack associated with the shake cooling conveyor. Moved to Main Plant Shakeout.**
324300	**Stack associated with the shake cooling conveyor. Moved to Main Plant Shakeout.**

Stack #324844 is part of the Hunter No.5 cooling line and is currently not listed in the ROP. This stack was added through PTI No. 28-22. Stacks 324176, 324188, 324196, 324204, and 324452 are general ventilation stacks with no duct work connected to any processes and have vent openings flush with the roofline. These stacks were removed from Main Plant Pouring and Cooling through PTI No. 28-22.

<u>EU-P018 Main Plant Shakeout</u>

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 with two fabric filter baghouses (Torit and Linsmeyer).

Emission/Material Limits

The Main Plant Shakeout contains PM, PM10, and PM2.5 emission limits that are made practically enforceable through proper operation and maintenance of the baghouses, monitoring of pressure drop across each baghouse, monitoring fan amperage for each baghouse, monitoring of visible emissions from each baghouse, and emissions testing if requested.

Process/Operational Restrictions

Grede maintains an O & M Plan (Rev. 12/15/2021) for the Main Plant Shakeout and associated control equipment. The facility is required to continuously monitor and maintain the proper operation of each baghouse for Main Plant Shakeout. Performance monitoring parameters with ranges of proper operation and observed data from control panels during the inspection are outlined in the table below. During the inspection, the Hermann baghouse was not in operation and ductwork was not connected to it.

Parameter	Range	Observed (10:59 AM CST)
Linsmeyer baghouse fan	55 – 85 Amps	73 Amps
Linsmeyer baghouse d.p.	3.0 – 7.0 in WC minimum	6.6 in WC

Parameter	Range	Observed (10:59 AM CST)
Torit baghouse fan	175 – 210 Amps	176 Amps
Torit d.p.	1.0 – 6.0 in WC minimum	2.5 in WC

Design/Equipment Restrictions

EU-P018 Main Plant Shakeout contains a requirement to not operate the process unless the fabric filter baghouses are installed, maintained, and operated in a satisfactory manner. Each baghouse is also required to be equipped with differential pressure gauges. During the inspection, the Linsmeyer and Torit #1 baghouses were installed and operational. The Hermann baghouse is installed on-site but no ductwork is connected, and it is not in operation. The Herman baghouse was removed as a control device from Main Plant Shakeout through PTI No. 28-22.

Testing/Sampling

Verification of PM, PM10, and PM2.5 emission rates from the Main Plant Shakeout has not been requested.

Monitoring/Recordkeeping

Grede is required to continuously monitor and record the differential pressure and fan amperage from the Torit #1 and Lindsmeyer baghouses as part of the Compliance Assurance Monitoring (CAM) plan. These operating parameters are continuously monitored from control panels that display the current fan amperage and differential pressure. In addition, the facility is required to monitor and record visible emissions observations from each of the three baghouses on a daily basis. Compliance with these required records were verified by requesting daily records for the dates 9/13/2021, 2/7/2022, and 4/27/2022. The records provided and reviewed indicate all operating parameters were within the respected ranges for proper operation.

As part of the O & M Plan, Grede keeps records of preventive maintenance (PM) performed on the IM Torit and Lindsmeyer. Monthly PM records were provided for January 2022. The records note the items inspected, the condition, and if a work order was needed. Based on the records reviewed and observations on-site, Grede appears to be maintaining the Main Plant Shakeout baghouses according to the O & M Plan.

Grede is required to maintain records of PM10 emissions from the Main Plant Shakeout on a 12-month rolling time period. For PM10 calculations, the facility is using a MAERS PM10 emission factor. For the period July 2021 through June 2022, PM10 emissions were 0.299 tons.

Stack/Vent Restrictions

The Linsmeyer and Torrit #1 baghouses were operating at the time of the inspection. No visible emissions were observed.

<u>EU-P021 Isocure</u>

Production of phenolic urethane coldbox (Isocure) cores in the Main Plant using dimethylethylamine. Isocure is a cold box process (no heat is applied). Core sand is mixed with a 2-part phenolic urethane liquid resin. Sand and resin are mixed in three mullers prior to addition to the core machines. A catalyst, dimethylethylamine (DMEA) gas, is introduced into the core box and purged through the core with superheated air. The cores are produced on ten Isocure core machines. After the Isocure Core is produced, it is generally dipped in a water-based core wash. The core wash is a suspension of fine clay or graphite that is applied to a core in metal casting to improve that portion's cast surface.

The cores are then dried in the Core Washing Oven. The heat source for the oven is natural gas combustion. The temperature of the oven can range up to 400°F. The oven is vented through a stack that exhausts above the building roof. Grede is currently using one of two core washes in

the Main Plant Isocure Coremaking process. These coatings are identified as Techni Kote 8282 (HA International Inc.) and Dura Kote FCZ (also a HA International Inc. product). Techni Kote 8282 is a water-based refractory coating that combines a ceramic refractory with graphite. It provides protection from metal penetration in medium to heavy section iron castings. The only compounds present in the core wash above 1% composition are quartz (SiO2), mica, and Kaolin. The coating's vapor pressure is 23 mbar or 17.25 mm of Hg. Dura Kote FCZ is a high solids zircon/ceramic blend refractory coating, designed for medium to heavy castings. It is effective in the reduction of veining, burn-in and burn-on in large gray iron castings. The only compounds present in the core wash are zircon ($Zr(SiO_4)$), Fuller's Earth, Quartz (SiO_2), and titanium dioxide. The coating's vapor pressure is 23 mbar or 17.25 mm of Hg.

The Main Plant Isocure mullers and sand silo 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

The Isocure process contains DMEA, PM, PM10, and VOC emission limits that are made practically enforceable through proper operation and maintenance of the baghouse and acid scrubber, along with emissions testing if requested.

Process/Operational Restrictions

Grede maintains an Operations & Maintenance Plan (Rev. 12/15/2021) for the Isocure process and associated control equipment. The facility is required to continuously monitor and maintain the proper operation of the Flex-Kleen baghouse and acid scrubber. The facility is required to monitor the actual PH and flow rate once per shift from the acid scrubber. Performance monitoring parameters with ranges of proper operation and observed data from control panels during the inspection are outlined in the table below.

Parameter	Range	Observed (10:31 AM CST)
Acid scrubber PH	0 – 4.5	3.0
Acid scrubber flow rate	80 – 130 gpm	71 gpm

Testing/Sampling

Verification of PM, PM10, DMEA, and VOC emission rates from the Main Plant Isocure has not been requested.

Monitoring/Recordkeeping

Grede is required to maintain records of PM10, DMEA, and VOC emissions from the Main Plant Isocure on a 12-month rolling time period. For PM10 emission calculations from the Isocure core making process and sand mullers, the facility is using PM10 stack test emission factors from a 2005 test. For the period July 2021 through June 2022, PM10 emissions were 0.008 tons from the core making process and 0.011 tons from the sand mullers. For VOC emissions from the core machines, the facility is using a VOC stack test emission factor from a 2005 stack test. For the period July 2021 through June 2022, VOC emissions were 0.332 tons from the core machines, DMEA emissions were 0.0155 tons.

Stack/Vent Restrictions

Stacks #324596 and #324598 from the acid scrubber were observed from the roof. No visible emissions were observed. Stack #324687 from the baghouse was observed and no visible emissions were detected.

<u>EU-P032 Module Sand System, EU-P034 Module Finishing, EU-P038 Module Shakeout</u>

The 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 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 Shakeout process includes the mechanical separation of castings, gates, risers, and sand by shaking in the Module Plant.

All three processes exhaust to the Torit baghouse. The Torit baghouse is a CAM subject control device.

Emission/Material Limits

These three Module processes contain PM and PM10 emission limits that are made practically enforceable through proper operation and maintenance of the Torit baghouse, monitoring of pressure drop across the Torit baghouse, monitoring fan amperage for the Torit baghouse, monitoring of visible emissions from the Torit baghouse, and emissions testing if requested.

Process/Operational Restrictions

Grede maintains an Operations & Maintenance Plan (Rev. 12/15/2021) for the Module processes and Torit baghouse. The facility is required to continuously monitor and maintain the proper operation of the Torit baghouse. Performance monitoring parameters with ranges of proper operation and observed data from control panels during the inspection are outlined in the table below.

Parameter	Range	Observed (10:08 AM CST)
Torit baghouse fan	175 – 220 Amps	190 Amps
Torit baghouse d.p.	1.0 – 6.0 in WC	2.5 in WC

Testing/Sampling

Verification of PM and PM10 emission rates from the Module processes has not been requested.

Monitoring/Recordkeeping

Grede is required to continuously monitor and record the differential pressure and fan amperage from the Torit baghouse as part of the compliance assurance monitoring (CAM) plan. These operating parameters are continuously monitored from a control panel that displays the current fan amperage and differential pressure. In addition, the facility is required to monitor and record visible emissions observations from the Torit baghouse on a daily basis. Compliance with these required records were verified by requesting daily records for the dates 9/13/2021, 2/7/2022, and 4/27/2022. The records provided and reviewed indicate all operating parameters were within the respected ranges for proper operation.

As part of the O & M Plan, Grede keeps records of preventive maintenance (PM) performed on the Module Torit baghouse. Monthly PM records were provided for March 2022. The records note the items inspected, the condition, and if a work order was needed. Based on the records

reviewed and observations on-site, Grede appears to be maintaining the Module Torit baghouse according to the O & M Plan.

Grede is required to maintain records of PM10 emissions from the Module Sand System, Shakeout, and Finishing on a 12-month rolling time period. For PM10 calculations, the facility is using a PM10 stack test emission factor from a 2005 stack test on the Sand System and using MAERS emission factors for Finishing and Shakeout with a control efficiency of 99% for the Torit baghouse. For the period July 2021 through June 2022, PM10 emissions were 0.087 tons from Sand System, 0.036 tons from Finishing, and 0.0525 tons from Shakeout.

Stack/Vent Restrictions

During the inspection, the stack to the Torit baghouse was observed to check for visible emissions. No visible emissions were observed.

<u>EU-P036 Module Pouring and Cooling</u>

Process includes all activities associated with the pouring and cooling of molten iron on one Hunter mold line in the Module Plant. Molten iron is supplied by a 20-ton Brown Boveri holding furnace that receives molten iron from the cupola. There is no emission control equipment associated with this emission unit. This emission unit is subject to MACT EEEEE.

Emission/Material Limits

Module Pouring and Cooling is subject to PM10 emission limits. These limits are practically enforceable through proper operation and maintenance, emission calculations, and emissions testing if requested.

Process/Operational Restrictions

At the time of the inspection, the Hunter mold line was in operation and appeared to be operating properly.

Testing/Sampling

Testing has not been requested for verification of PM10 emission rates from Module Pouring and Cooling.

Monitoring/Recordkeeping

Grede is required to maintain records of PM10 emissions from the Module Plant Pouring and Cooling on a 12-month rolling time periodFor PM10 calculations, the facility is using a PM (Filterable) stack test emission factor from the December 2020 stack test and taking the ratio of PM10 to PM emission factors from the DEQ Foundry Factsheet (11/05) to calculate a PM10 emission factor for Module Plant Pouring and Cooling. For the period July 2021 through June 2022, PM10 emissions were 0.113 tons.

Stack/Vent Restrictions

The three Module Pouring and Cooling stacks were inspected on the roof for visible emissions. No visible emissions were observed.

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.

Emission/Material Limits

The Sand Conditioning System contains PM and PM10 emission limits that are made practically enforceable through proper operation and maintenance of the Steelcraft baghouse, monitoring of pressure drop across the baghouse, monitoring fan amperage for the baghouse, monitoring of visible emissions from the baghouse, and emissions testing if requested.

Process/Operational Restrictions

Grede maintains an Operations & Maintenance Plan (Rev. 12/15/2021) for the Sand Conditioning System and associated control equipment. The facility is required to continuously monitor and maintain the proper operation of the baghouse for the Sand Conditioning System. Performance monitoring parameters with ranges of proper operation and observed data from the control panel during the inspection are outlined in the table below.

Parameter	Range	Observed (10:18 AM CST)
Steelcraft baghouse fan	110 – 160 Amps	148 Amps

Steelcraft baghouse d.p.	**3.5 – 5.5 in WC minimum**	**4.8 in WC**

Testing/Sampling

Verification of PM and PM10 emission rates from the Sand Conditioning System has not been requested.

Monitoring/Recordkeeping

Grede is required to continuously monitor and record the differential pressure and fan amperage from the Steelcraft baghouse as part of the compliance assurance monitoring (CAM) plan. These operating parameters are continuously monitored from a control panel that displays the current fan amperage and differential pressure. In addition, the facility is required to monitor and record visible emissions observations from the Steelcraft baghouse on a daily basis. Compliance with these required records were verified by requesting daily records for the dates 9/13/2021, 2/7/2022, and 4/27/2022. The records provided and reviewed indicate all operating parameters were within the respected ranges for proper operation.

As part of the O & M Plan, Grede keeps records of preventive maintenance (PM) performed on the Sand Conditioning System baghouse. Monthly PM records were provided for May 2022. The records note the items inspected, the condition, and if a work order was needed. Based on the records reviewed and observations on-site, Grede appears to be maintaining the Sand Conditioning System baghouse according to the O & M Plan.

Grede is required to maintain records of PM10 emissions from the Sand Conditioning System on a 12-month rolling time period. For PM10 calculations, the facility is using a PM10 stack test emission factor from a 2005 test. For the period July 2021 through June 2022, PM10 emissions were 0.6935 tons.

Stack/Vent Restrictions

During the inspection, the stack to the Steelcraft baghouse was observed to check for visible emissions. No visible emissions were observed.

<u>EU-P041 Main Plant Bond Silo, EU-P042 Module Bond Silo</u>

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. The bin vent filter vents into the plant environment.

The Module 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. The Flex Kleen bin vent filter exhausts into the plant environment.

Emission/Material Limits

The Main Plant and Module Bond Silo processes contain a PM emission limits that is made practically enforceable through proper operation and maintenance of the bin vent filters, and emissions testing if requested.

Process/Operational Restrictions

At the time of the inspection, the bond silos were in operation and appeared to be operating properly.

Testing/Sampling

Testing has not been requested for verification of PM10 emission rates from Module Pouring and Cooling.

<u>EU-P043 Module Isocure</u>

Production of phenolic urethane coldbox (Isocure) cores in the Module Plant using dimethylethylamine. Isocure is a cold box process (no heat is applied). Core sand is mixed with a 2-part phenolic urethane liquid resin. Sand and resin are mixed in a muller prior to addition to three core machines. A catalyst, dimethylethylamine (DMEA) gas, is introduced into the core box and purged through the core with superheated air. The cores are produced on three Isocure core machines.

After the Isocure Core is produced, it is generally dipped in a water-based core wash. The core wash is a suspension of fine clay or graphite that is applied to a core in metal casting to improve that portion's cast surface. The cores are then dried in the Core Washing Oven. The heat source for the oven is natural gas combustion. The temperature of the oven can range up to 400°F. The oven is vented through a stack that exhausts above the building roof. Grede is currently using one of two core washes in the Module Plant Isocure Coremaking process. These coatings are

identified as Techni Kote 8282 (HA International Inc.) and Dura Kote FCZ (also a HA International Inc. product). Techni Kote 8282 is a water-based refractory coating that combines a ceramic refractory with graphite. It provides protection from metal penetration in medium to heavy section iron castings. The only compounds present in the core wash above 1% composition are quartz (SiO2), mica, and Kaolin. The coating's vapor pressure is 23 mbar or 17.25 mm of Hg. Dura Kote FCZ is a high solids zircon/ceramic blend refractory coating, designed for medium to heavy castings. It is effective in the reduction of veining, burn-in and burn-on in large gray iron castings. The only compounds present in the core wash are zircon ($Zr(SiO_4)$), Fuller's Earth, Quartz (SiO_2), and titanium dioxide. The coating's vapor pressure is 23 mbar or 17.25 mm of Hg.

The Module Plant Isocure muller and sand silo emissions are controlled by the Torit baghouse. Emissions from the Module Plant Isocure core machines are controlled by a cartridge filter followed by an acid scrubber.

Emission/Material Limits

The Isocure process contains DMEA, PM, PM10, and VOC emission limits that are made practically enforceable through proper operation and maintenance of the baghouse and acid scrubber, along with emissions testing if requested.

Process/Operational Restrictions

Grede maintains an Operations & Maintenance Plan (Rev. 12/15/2021) for the Isocure process and associated control equipment. The facility is required to continuously monitor and maintain the proper operation of the Torit baghouse and acid scrubber. The facility is required to monitor the actual PH and flow rate once per shift from the acid scrubber. Performance monitoring parameters with ranges of proper operation and observed data from control panels during the inspection are outlined in the table below.

Parameter	Range	Observed (10:06 AM CST)
Acid scrubber PH	0 – 4.5	4.4
Acid scrubber flow rate	25 – 45 gpm	32 gpm

Testing/Sampling

Verification of PM, PM10, DMEA, and VOC emission rates from the Main Plant Shakeout has not been requested.

Monitoring/Recordkeeping

Grede is required to continuously monitor and record the differential pressure from the Torit baghouse during production operations and record the actual pH and flow rate of the acid scrubber once per shift. These operating parameters are continuously monitored from a control panel for the differential pressure across the Torit baghouse and gauges equipped on the acid scrubber for pH and flow rate. Compliance with these required records were verified by requesting daily records for the dates 9/13/2021, 2/7/2022, and 4/27/2022. The records provided and reviewed indicate all operating parameters were within the respected ranges for proper operation.

As part of the O & M Plan, Grede keeps records of preventive maintenance (PM) performed on the Module GFE Scrubber. Monthly PM records were provided for April 2022. The records note the items inspected, the condition, and if a work order was needed. Based on the records reviewed and observations on-site, Grede appears to be maintaining the Module GFE Scrubber according to the O & M Plan.

Grede is required to maintain records of PM10, DMEA, and VOC emissions from the Module Isocure on a 12-month rolling time period. For PM10 emission calculations from the Isocure core making process and sand mullers, the facility is using PM10 stack test emission factors from a 2005 test. For the period July 2021 through June 2022, PM10 emissions were 0.0075 tons from the core making process and 0.0035 tons from the sand mullers. For VOC emissions from the core machines, the facility is using a VOC stack test emission factor from a 2005 stack test. For the period June 2020 through May 2021, VOC emissions were 0.03 tons from the core machines. DMEA emissions were 0.005 tons.

Stack/Vent Restrictions

Stacks from the acid scrubber were observed from the roof. No visible emissions were observed.

FG-MACTEEEEE

Grede is subject to the Iron and Steel Foundry MACT, Subpart EEEEE, since the facility is considered a major source of HAPs. The regulations cover emissions from metal melting furnaces, scrap preheaters, new pouring areas, pouring stations, new automated conveyor and new pallet cooling lines, new automated shakeout lines, mold and core making lines, and fugitive emissions from foundry operations. The affected emission units at the source that are subject to

MACT EEEEE include EU-009 Cupola, EU-016 Main Plant Pouring and Cooling, EU-P036 Module Pouring and Cooling, and any fugitive emissions.

Emission/Material Limits

MACT EEEEE contains PM and VOHAP limits for the cupola and PM limits for Main Plant and Module Pouring and Cooling. The federal regulation also contains a fugitive opacity limit for each building or structure that houses an affected emission unit. Compliance with these emission limits is demonstrated through testing, monitoring and recording of performance parameters, and control device inspections and maintenance.

Process/Operational Restrictions

Grede maintains an operations and maintenance plan that includes responsible personnel, inspection schedule, recording of monitoring parameters, and predictive maintenance. The pouring and cooling processes do not have any associated air pollution control equipment. The cupola contains operating limits for the afterburner temperature, baghouse fan amperage, and baghouse differential pressure. These limits are listed in the O&M Plan. The O&M Plan also lists the cupola startup process, charging process, tap out process, and draining the cupola. The plan lists what constitutes a shutdown of the cupola along with normal operating conditions following the startup of the cupola. The cupola will shutdown if the upper stack temperature reaches above 1900 degrees Fahrenheit and the baghouse inlet temperature reaches above 530 degrees Fahrenheit.

After the coke bed has been burned, normal operating conditions include the baghouse blower motor current between 115 to 281 amps, the combustion zone temperature at a minimum of 1300 degrees Fahrenheit, and the baghouse inlet temperature between 360 to 495 degrees Fahrenheit. During the inspection, these normal operating parameters were observed from the control system. The combustion zone temperature was being maintained above 1300 degrees Fahrenheit during "on-blast" status of the cupola.

Grede has a scrap certification and selection plan pursuant to 40 CFR 63.7700(b) and 40 CFR 63.7700(c). Grede certifies they only purchase and operate with prepared scrap or other materials that do not include: post-consumer automotive body scrap, dust, dirt, rust, debris, fluff, rubber, paper, cloth, plastic, engine blocks, lead (wheel weights, battery cables, pope or components, etc.). No radioactive material, mercury or mercury containing components, PCB's, batteries, and/or free liquids (per EPA Method 9095B) are allowed.

The Ground Man of the Charging team is responsible for inspecting new scrap material as its delivered. In order for the scrap steel to be acceptable, the following conditions must be met:

cylindrical or bar shaped stock (especially if solid): maximum length = 20 inches, maximum diameter = 8 inches, rectangular shaped stock: maximum width = 12 inches, maximum length = 20 inches, maximum thickness = 2 inches, maximum dimension in any direction = 30 inch, no visible lead, no visible mercury devices, plastics removed to the extent practicable, no free organic liquids (oils, etc). A Steel Scrap Inspection Log is maintained for each shipment that includes a checklist for the material being sized correctly, no visible lead, no visible mercury devices, plastics removed to the extent possible, no free organic liquids, and reason the load was rejected (if applicable).

The O&M plan specifies inspections and maintenance for the air pollution control devices. Besides required visual inspections and recordkeeping, gauges are calibrated semi-annually, along with quarterly monitoring of fan wear, material buildup, corrosion inspections, etc. The plan states there are monthly observations of the physical appearance of the capture and ventilations system equipment (holes, dents, accumulated dust, fan condition).

Design/Equipment Parameters

The cupola is required to not be operated unless the afterburners, quench tank, and baghouse are installed, operated and maintained in accordance with the approved O&M Plan. At the time of the inspection, all air pollution control equipment was in operation.

Testing/Sampling

Testing for PM, VOHAP, opacity, and total metal HAP was last performed during the December 2020 performance test. Main Plant and Module Plant pouring and cooling passed for PM, and the cupola passed PM, VOHAP, and fugitive opacity limits. Testing against these limits is next required by December 2025.

Grede is also required to conduct fugitive opacity testing from each structure housing an emission source subject to MACT EEEEE on a semi-annual basis. Testing was lasted performed on April 7, 2022. Visible emissions testing was performed at the northeast corner of the cupola housing structure and the side walls of the main building structure that houses the Main Plant Pouring and Cooling and Module Pouring and Cooling. Opacity reading averages were all below 20%.

Monitoring/Recordkeeping

Grede has a continuous monitoring system for the cupola and associated air pollution control equipment. This system was in operation during the inspection. The control system provides real time data on the operating parameters of the cupola and air pollution control equipment. The

afterburner temperature, baghouse fan amperage, and baghouse differential pressure are also recorded daily.

Reporting

Grede is required to provide semiannual compliance and deviation reports for any emission limitation or operation and maintenance requirements in the subpart. According to 40 CFR 63.7751(d), the facility is allowed to include deviations from the MACT requirements in the Part 70 (Title V) compliance and deviation report. Submission of the Part 70 monitoring report satisfies any obligation to report the same deviations in the MACT EEEE semiannual report. For 2021, the facility reported they are in compliance with all the applicable emission limitations, work practice standards, and O & M requirements for the reporting period except for the deviations listed for the Cupola.

Source-Wide

Covers all processes at the facility including raw material handling (metal, fluxes, metallurgical coke), metal melting, mold and core production, casting, and finishing.

Emission/Material Limits

The facility has source-wide limits for PM10 and VOCs on a 12-month rolling time period. Compliance with these limits is demonstrated through emission calculations and recordkeeping. For the period July 2021 through June 2022, total PM10 emissions were 9.4 tons and total VOC emissions were 21.232 tons. Based on the emissions reported and reviewed, Grede is in compliance with the source-wide emission limits.

AQD No. 2021-01

Compliance Program

***No. 9*: Updated O&M Plan provided on 12/16/21, AQD approved.**

***No.10*: EU-P009 Cupola passed SC I.1 and 3 (CO) limits in December 2020, SC I.5 (PM10) limit passed in December 2021. Facility is keeping visible emission records from cupola baghouse.**

***No. 11(A)*: FGMACTEEEEE testing was conducted in December 2020. All emission rates passed. Testing is next required by December 2023.**

***No. 11(B)*: EU-P009 Cupola passed SC I.1 and 3 (CO), SC I.4 (PM), SC I.7 and 8 (SO2), and SC I.10 (VE) limits in December 2020. SC I.5 (PM10) limit passed in December 2021.**

***No. 11(C):* Visible emissions tests being conducted semiannually, notifications being provided.**

***No. 12*: Semiannual reports being provided timely. Facility is keeping records of pressure drop and fan amperage.**

***No. 13*: Updated O&M Plan provided on 12/16/21, AQD approved. Updated fugitive dust plan from 12/12/2019, AQD approved.**

***No.14*: Module Torit Collector is being properly operated and maintained. The facility is documenting on deviations reports when the cupola cap is opened and from reports reviewed, it's only for short periods during malfunction periods. The Isocure and Module Isocure acid scrubbers are being operated at proper pH and flow rate to the ranges specified in the ROP.**

Compliance

Based on the full compliance evaluation (FCE) performed, Grede is currently in compliance with MI-ROP-B1577-2020, PTI No. 28-22, and 40 CFR Part 63, Subpart EEEEE.

NAME _____ DATE 09/09/2022 SUPERVISOR _____