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

B199168367

FACILITY: GM LLC Saginaw Metal Casting Operations		**SRN / ID:** B1991
LOCATION: 1629 N. WASHINGTON, SAGINAW		**DISTRICT:** Bay City
CITY: SAGINAW		**COUNTY:** SAGINAW
CONTACT: David Thibeault ,		**ACTIVITY DATE:** 07/26/2023
STAFF: Gina McCann	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Full compliance inspection of MI-ROP-B1991-2021b and ACO 2022-11.		
RESOLVED COMPLAINTS:		

I (glm) performed an announced inspection of the plant. David Thibeault is the current Environmental Engineer for the Saginaw plant. Jeff Hummel, Project Engineer was also on the inspection. Jeff's role is coordinating NSR and ROP permitting efforts for the Saginaw plant as well as other GM facilities.

Prior to the inspection I sent a records request. Attached is the request sent on July 24, 2023. On July 26, 2023, I toured the facility and viewed process and control device operations.

General Motors, LLC – Saginaw Metal Casting (SMCO), is located at 1629 North Washington, Saginaw, Michigan. The facility operates an aluminum casting foundry for the production of engine blocks and heads for the automotive industry. The facility is permitted for a green sand aluminum line, precision sand aluminum line and semi-permanent molding aluminum lines. The site has pre-machining, sand handling and casting, aluminum melting, pouring, cooling, and cast finishing. There are also several backup generators utilized in emergency situations.

GM SMCO was issued MI-ROP-B1991-2021b on May 19, 2022, which incorporated PTI 36-12M. PTI No. 36-12M allowed the conveyor duct to be changed back to the original installation configuration, as a part of EU-PSANDSH and revising EU-PSANDCASTLINE and EU-PSANDSH, and to increase VOC limits for EU-PSANDSH. Since the issuance of this ROP the facility was in the process of accepting draft conditions for PTI 36-12N. PTI 36-12N was to change the emissions limits for EUPSANDPROCESS, EUSPMPROCESSAND, and EUSPMCASTLINE. This PTI was not issued at the time of the inspection and therefore this inspection covered conditions in MI-ROP-B1991-2021b.

On July 28, 2022, Saginaw Metal Casting Operations of General Motors, LLC entered into an Administrative Consent Order (ACO) with the Air Quality Division to resolve violations of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.5501 et seq.; Rule 201, Rule 331, and Rule 702 of the Michigan Air Pollution Control Rules, Mich Admin Code, R. 336.1201, R 336.1331, and R 336.1702; and the conditions of the Company's Renewable Operating Permit (ROP) No. MI-ROP-B1991-2021 and Permit to Install (PTI) No. 36-12L. Specifically, GM SMCO failed to account for volatile organic compound (VOC) emissions from the core sand in the initial PTI 36-12 for EU-PSANDPROCESS and EU-SPMPROCESSAND; exceeded the VOC emission limit from EU-PSANDSH (formerly EU-PSANDSCCSH), and exceeded the particulate matter (PM) emission limit from EU-SPMPROCESSAND, as cited in the Violation Notices dated June 24, 2021, October 29, 2021, and January 7, 2022. The ACO is eligible for termination on July 28, 2025.

The ACO requires GM SMCO to compete the installation of a Bag Leak Detection System (BLDS) for the EU-SPMPROCESSAND fabric filter collector and notify the AQD Bay City District Supervisor in writing of the date the BLDS installation was complete by July 28, 2023. Notification of July 24, 2023, installation was received July 25, 2023. The facility is required to submit an MAP within 60 days of BLDS installation (September 22, 2023).

Source-Wide Conditions

Source-wide conditions are related to the provision of 1994 PA 451, Section 324.5524 (Fugitive sources or emissions). GM sent a revised fugitive dust plan on October 28, 2022, updating the responsible operator and removal of roll off containers from the location of staging and transfer piles section. The fugitive dust plan says the facility will spray the unpaved roadways when required, during plant operations from April through October and record said activities. To determine if dust suppression is required, a monthly inspection of unpaved roadways will be completed. I reviewed records for April through October 2022. In general, the areas of concern were observed in good condition. There was an area of spilled sand identified near the SPM sand silos and baghouses. Environmental Engineer sent an email to maintenance staff to address and it was addressed promptly.

EU-PSANDALUMINUM

This emission unit is a supply of molten aluminum. It consists of two natural gas fired aluminum melting/holding furnace for aluminum/alloy production using "clean charge" with flux addition and drossing and degassing well (argon). For each furnace, reverberatory design melt heat input rate 40 MMBTU/hr for 6 tons/hr melt rate and 20 MMBTU/hr heat input in holding operational mode. Electrically heated launder system vented in-plant. Electrically heated furnace with pump well where metal is pumped to the molds, with degassing well (argon) vented in-plant. No pollution control equipment is associated with this emission unit.

Special condition (SC) III.1. restricts operation of the furnaces in EU-PSANDALUMINUM as a melting furnace for more than a combined total of 5,300 hours per 12-month rolling time period as determined at the end of each calendar month. SC VI.1.a. is the associated monitoring and recordkeeping requirement to maintain hours of operation of each furnace and the sum of the furnaces as a melting furnace. The unit operated for 4,820 hours as a melting furnace for the 12-month rolling time period ending June 2023.

NOx emissions are limited to 13.78 ton per year (tpy) based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.1.c. is the associated monitoring and recordkeeping requirement that requires NOx emissions to be calculated monthly and for a 12-month rolling time period as determined at the end of each calendar month. NOx emissions were 2.06 tpy for the 12-month rolling time period ending June 2023.

Material usage is limited to 6 tons per hour for metal feed/charge rate based on a monthly average. Tons of metal fed/charged per hour ranged from 1.19 tph in April 2023 to 1.55 tph in June 2023.

Flux usage rate (total injection flux and broadcast flux) is limited to 11,316 pounds per year (lbs/yr) based on a 12-month rolling time period based at the end of each calendar month. For the 12-month rolling time period ending June 2023 the flux usage rate was 2,070 lbs/yr.

A monthly and 12-month rolling time period, natural gas usage rate is required per special condition VI.1.b. The 12-month rolling time period ending June 2023 was 85 MMCF.

Special condition VI.1.d. requires average, monthly, PM, PM10 and PM2.5 emissions recorded in pph. Records are kept in tons per month and based off stack test data. For all species of PM emissions were 0.53 pph.

EU-PSANDPROCESS

This emission unit performs sand processing by utilizing a 220-ton new sand storage silo with bin vent filter receives sand via blower truck and two 30 ton pre-reclaim sand silos receive process sand recovered in the facility. Sand from both silos is transported to two natural gas fired fluidized bed sand reclaim systems (sand reclaim furnace, sand cooler, sand screen, and deduster) (design heat input rate of 22 MMBtu/hr - total for two sand reclaim systems) for cleaning and preparation of sand. From there, sand is transferred to the prepared sand silo. The new sand storage silo has a bin vent filter. PM emissions from the pre-reclaim sand silo, sand transfer system, fluidized bed sand reclaim, and prepared sand silo are controlled by two 31,200 scfm fabric filter collectors, one for each sand reclaim system. GM SMCO staff refer to this unit as the thermal sand reclaim.

SC I.1 restricts visible emissions from the new sand storage silo to zero emissions as observed via Method 22 on an annual basis. SC VI.1.f. is the associated monitoring and recordkeeping requirement that requires the plant to view the presence or absence of visible emissions from the bin vent filters during loading of sand into the silo as determined by an observer using EPA Method 22. PTI 36-12K revisions allowed the plant to accept spent sand from the Defiant, Ohio plant for reclaim. The plant regenerates the Defiant sand and utilizes in their process and new sand has not been loaded into the sand silo since February 2023. The silo is used frequently only when the thermal sand reclaim unit is down for extensive repair or servicing. During the inspection we viewed the location of the bin vents. They exhaust internal to the building, which presents a problem for performing a Method 22. Picture of the bin vents are attached to this report. For the purposes of this inspection, I did not review compliance with this condition. GM SMCO plans to revise this condition during their next PTI application.

SC I.2 restricts visible emissions from the two fluidized bed sand reclaim process units to 10 percent opacity based on a 6-minute average. The facility performed testing November 3-5, 2021, to verify compliance with this limit. The results were 0.0% opacity during the highest 6-minute average.

SC I.3.4.5.7.8. and 9, restrict the various species of particulate matter. SC VI.1.d. is the associated monitoring and recordkeeping requirement that requires the plant to calculate a monthly average of PM, PM10 and PM2.5 emissions. The monthly averages for June 2022 through June 2023 were as follows:

EU-PSANDPROCESS, PM, PM10 &PM2.5 Averaged Emissions in pph from June 2022 to June 2023

Month	Year	Reclaim Unit 1 Hours	Unit 1 MMCF	Tons PM/Month	lb/PM-10/ hour Sand	lbs PM 10/ hour GAS	Total hourly PM 10	Tons PM-10/ Month	lbs PM2.5/ hour Sand	lbs PM 2.5/ hour GAS	Total hourly PM 2.5	Tons PM 2.5/ Month
Jan	2023	181	0.854	0.0421	0.04	0.04	0.07	0.01	0.04	0.04	0.07	0.01
Feb	2023	167	0.263	0.0388	0.03	0.01	0.04	0.00	0.03	0.01	0.04	0.00
Mar	2023	175	0.661	0.0407	0.04	0.03	0.06	0.01	0.04	0.03	0.06	0.01
Apr	2023	183	0.507	0.0425	0.03	0.02	0.05	0.00	0.03	0.02	0.05	0.00
May	2023	11	0.002	0.0026	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00
Jun	2023	9	0.000	0.0021	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00
Jul	2022	289	1.234	0.0672	0.03	0.03	0.06	0.01	0.03	0.03	0.06	0.01
Aug	2022	347	1.825	0.0807	0.03	0.04	0.07	0.01	0.03	0.04	0.07	0.01
Sep	2022	406	2.391	0.0944	0.05	0.04	0.09	0.02	0.05	0.04	0.09	0.02
Oct	2022	621	2.738	0.1444	0.04	0.03	0.07	0.02	0.04	0.03	0.07	0.02
Nov	2022	481	2.760	0.1118	0.04	0.04	0.08	0.02	0.04	0.04	0.08	0.02
Dec	2022	422	2.255	0.0981	0.02	0.04	0.06	0.01	0.02	0.04	0.06	0.01
	Tons/Yr			0.77				0.11				0.11

Month	Year	Reclaim Unit 2 Hours	Unit 2 MMCF	Tons PM/ Month	lb/PM-10/ hour Sand	lbs PM 10/ hour GAS	Total hourly PM 10	Tons PM-10/ Month	lbs PM2.5/ hour Sand	lbs PM 2.5/ hour GAS	Total hourly PM 2.5	Tons PM2.5/ Month
Jan	2023	266	1.619	0.0618	0.04	0.05	0.08	0.01	0.04	0.05	0.08	0.01
Feb	2023	427	2.493	0.0993	0.03	0.04	0.07	0.02	0.03	0.04	0.07	0.02
Mar	2023	347	2.475	0.0807	0.04	0.05	0.09	0.02	0.04	0.05	0.09	0.02
Apr	2023	323	2.124	0.0751	0.03	0.05	0.08	0.01	0.03	0.05	0.08	0.01
May	2023	447	2.959	0.1039	0.04	0.05	0.09	0.02	0.04	0.05	0.09	0.02
Jun	2023	482	3.560	0.1121	0.04	0.06	0.10	0.02	0.04	0.06	0.10	0.02
Jul	2022	177	0.928	0.0412	0.03	0.04	0.06	0.01	0.03	0.04	0.06	0.01
Aug	2022	230	1.249	0.0535	0.03	0.04	0.07	0.01	0.03	0.04	0.07	0.01
Sep	2022	0	0.000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oct	2022	0	0.000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov	2022	0	0.000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dec	2022	415	0.000	0.0965	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00
	Total Tons/Yr			0.72				0.12				0.12

SC I.11 restricts NOx emissions to 8.41 ton per year (tpy) based on a 12-month rolling time period as determined at the ed of each calendar month. SC VI.1.c. is the associated monitoring and recordkeeping requirement that requires the plant to record monthly and 12-month rolling time period as determined at the end of each calendar month NOx emissions. For the time period ending June 2023 the NOx emissions were 1.64 tpy.

SC II.1. limits the new and recovered core sand throughput to 108,660 tons based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.1.a. is the associated monitoring and recordkeeping requirement that requires the plant to record monthly, the new and recovered core sand throughput rate, based on a 12-month rolling time period as determined at the end of each calendar month. For the time period ending June 2023 the unit processed 26,350 tons of sand.

The emission unit only burns natural gas. SC III.2. restricts the number of hours each natural gas fired fluidized bed sand reclaim process unit in EU-PSANDPROCEES can burn natural gas to 7,800 hours based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.1.g. is the associated monitoring and recordkeeping requirement that requires the plant to record monthly and 12-month rolling time period as determined at the end of each calendar month, the natural gas usage rate. For the time period ending June 2023, reclaim unit 1 (west) operated 3,292 hours and reclaim unit 2 (east) operated 3,114 hours.

SC IV.1. requires the fabric filter collector to be installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the fabric filter dust collector requires a pressure drop range between 0.5 and 10 inches of water column. The minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced. SC VI.1.e. is the associated monitoring and recordkeeping requirement that requires the plant to maintain records for the fabric filter monitoring as defined in the approved malfunction abatement plan (MAP). During the inspection stack baghouse Z02-BH2 (east) was operating at 3.38 inches of water column ("W.C.) and Z02-BH2 (west) was down and had been for at least a month. I reviewed pressure drop records for the months of July 2022 through June 2023. During times of operation, differential pressure was in the approved range.

SC VI.1.b. requires the plant to record natural gas usage on a monthly and 12-month olling time as determined at the end of each calendar month. Each unit operated as ollows for the 12-month rolling time period ending June 2023.

EU-PSANDPROCESS, Natural Gas Usage Rate for Monthly and 12 Month Rolling Ending June 2023

Permit Ref	Data	Unit	Material	JAN 2023	FEB 2023	MAR 2023	APR 2023	MAY 2023	JUN 2023	JUL 2022	AUG 2022	SEP 2022	OCT 2022	NOV 2022	DEC 2022	12 Month Rolling Total
VI 1b	Plant Gas Meters	Reclaim gas Unit 1 (West)	Natural Gas Usage (MMCF)	0.85	0.26	0.66	0.51	0.002	0.00	1.23	1.82	2.39	2.74	2.76	2.26	15.49
VI 1b	Plant Gas Meters	Reclaim gas Unit 2 (East)	Natural Gas Usage (MMCF)	1.62	2.49	2.47	2.12	2.96	3.56	0.93	1.25	0.00	0.00	0.00	0.00	17.41

SC VI.2. restricts operation of EU-PSANDPROCESS unless a MAP is implemented and maintained. According to the MAP revisions dated March 15, 2022 the pressure gauges on the fabric collectors are calibrated annually and an inspection of the baghouse consists of a quarterly check for sand on the clean side of the fabric filter collector and check bag integrity. Maintenance records indicate the collectors are being maintained accordingly.

On July 28, 2022, Saginaw Metal Casting Operations of General Motors, LLC entered into an Administrative Consent Order (ACO) with the Air Quality Division to resolve VOC violations. Specifically, GM SMCO failed to account for volatile organic compound (VOC) emissions from the core sand in the initial PTI 36-12 for EU-PSANDPROCESS. Paragraph 9B. of ACO 2022-11 requires that on and after the effective date of this Consent Order, the Company shall comply with the VOC emission limits for EU-PSANDPROCESS and EU-SPMPROCESSAND as specified in Condition I.9 of MI-ROP-B1991-2021 b, as amended, for each emission unit. The VOC emission limit is 4.12 pph as determined through stack testing. VOCs from this emission unit were 1.11 pph during the most recent testing of this unit on November 3-5, 2021.

This unit had a bag leak detection system installed on it. We viewed during the inspection, but I did not record or ask for any associated data.

PSANDCOREROOM

Core Room Processes include Sand Handling and Mixing which is sand from the prepared sand silo is pneumatically transported to the six core machine sand hoppers. The individual sand hoppers feed the sand mixers where polyurethane resin is mixed with the sand.

Core Making includes six cold box core machines. Dimethyl isopropylamine (DMIPA) is used to cure the mixed sand, in the core making machines.

Core Box Tooling Maintenance includes the use of a core release chemical, metal cleaner, a high pressure water wash, and core box washing station.

Cylinder Liner Cleaning and Heating is the cleaning by shot blast; induction heating used to preheat cylinder liners prior to contact with molten aluminum, vented in-plant.

Final Mold Assembly is the physical assembly of the parts of the final mold/core package. The assembly process includes reusable chill plates. Emissions are negligible and vented in-plant.

This unit is subject to Compliance Assurance Monitoring (CAM) requirements, because it has a potential pre-control emissions of greater than the major source threshold levels for VOCs. The 25,000 scfm cyclone and packed tower acid scrubber are the CAM subject devices and they monitor liquid flow, pH and differential pressure. The facility measures pressure drop, scrubber flow, and pH and record every 15 minutes for an hourly average as an indicator of proper operation of the scrubber. The indicator range for pressure drop is 0.1 to 6 inches, pH is less than 4.5 and scrubber flow is greater than 190 gallons per minute (gpm). During the tour of the facility I viewed the flow at 223 gpm, pH at 4.04, and differential pressure at 3.02 "W.C. Collector Z03-CC-02 was operating at 3.22 "W.C. I also reviewed associated monitoring records for the months of July 2021 through june 2023. During times of operation the control devices were operating in a satisfactory manner.

SC II.1. restricts the amount of DMIPA used on a 12-month rolling time period as determined at the end of each calendar month 481 tpy. The facility used 18 tpy for the 12-month rolling time period ending June 2023.

VOCs are limited for each area in this process, based on a 12-month rolling time period as determined at the end of the month. The table below compares actual emissions with permit limits.

Equipment	Limit (tpy)	12-month rolling time period ending June 2023 (tpy)
Cold box core machines	22.00	15.08
	8.80	3.48

Fugitive emissions from core handling		
Cold box core machine cleaning	**14.17**	**2.32**
Core box cleaning	**1.02**	**0.0**

***The core box cleaning was not used for the last 12 months.**

SC IV. 1. And 2 restrict operation of the sand hoppers and sand mixers and cylinder liner cleaning operations unless the associated cartridge collectors are installed, maintain, and operated in a satisfactory manner. The facility said cartridge changes are performed in response to differential pressure out of range or mechanical inspection PMs/workorders. Maintenance does not generate a separate workorder to record/track the cartridge replacement. Therefore, unless it was documented in the mechanical inspection workorder or logged into the maintenance end of shift notes, the activity is not recorded. I reviewed the differential trend for each cartridge collector. The DP trending can be indicative of filter changes as DP drops and trending becomes much less linear. The trend indicated a cartridge change on May 30, 2023, for collector Z05-CC-02.

EU-PSANDCASTLINE

This emission unit is cast line processes which consists of activities such as pouring and cooling of castings in the molds, mold cooling, and chill plate cleaning. Shakeout, or separation of cooled castings from the molds is also part of this emission unit. The processed is heated by a 10 MMBtu/hr natural gas-fired duct burner.

Shakeout emissions are controlled through a 30,000 scfm fabric filter collector followed by a Regenerative Thermal Oxidizer (RTO). These devices are subject to CAM requirements, because they have potential pre-controlled PM and VOC emissions greater than the major source threshold levels.

Pouring and cooling emissions are controlled through a 30,000 scfm cartridge collector followed by the 60,000 scfm RTO. During the 2021 ROP renewal, it was determined this device was also subject to CAM due to pre-control emissions greater than 100 tons for PM.

The CAM plan monitoring requirements are for differential pressure on the fabric filter and cartridge collector and continuous monitor of the combustion chamber with a 3-hour rolling average of temperature greater than 1400F as an indicator of proper operation. During the inspection I was able to view the RTO and local readout of 1466F. The facility has more than one RTO in place, but only RTO #3 is connected. The other RTOs are for previous devices no longer in service. The indicator range is between 1.0 and 7.0 "W.C. for the fabric filter and 0.1 to 8.0 "W.C. for the cartridge collector, except when a large number of filter bags have been replaced. During the

inspection the fabric filter differential pressure was 1.4 "W.C. and the cartridge collector was at 0.8 "W.C.

SC II.1. restricts the amount of aluminum poured to 17, 490 tons per year based on a 12-month rolling time period as determined at the end of the calendar year. SC VI.1.a. is the monitoring and recordkeeping requirement associated with this condition, which requires the plant to record the aluminum throughput monthly and on a 12-month rolling time period. For the 12-month rolling time period ending June 2023, the plant poured 6,633 tons of aluminum.

SC VI.1.b. and VI.2. restrict operation of EU-PSANDCASTLINE unless the fabric filter is monitored according to the malfunction abatement plan (MAP). GM SMCO submitted a revised MAP with the ROP renewal. The approved plan is on file dated March 15, 2022.

I reviewed opacity checks for May 2022 through June 2023. No opacity was observed, on any of the stacks, during these time periods. I reviewed the differential pressure for the fabric filter and cartridge collector for the months of September 2022, January 2023, and April 2023. The pressure differential was in compliance range during these periods of operation.

SC IV.1. restricts operation of EU-PSANDCASTLINE unless the RTO is operated in a satisfactory manner, which requires a minimum temperature of 1400F. SC VI.1.c. and VI.2. are the associated monitoring and recordkeeping requirements for the operation of the RTO. I reviewed chamber temperatures for September 2022, January 2023, and April 2023 and during times of operation the RTO operated above 1400F. Additionally, the MAP requires the pressure gauges on the fabric filter and cartridge collector and the thermocouple on the RTO to be calibrated annually. According to maintenance records, it appears both pressure gauges were calibrated in July 2023 and the RTO thermocouple was calibrated in January 2023. Additionally, inspections on the burners, fans, etc. was performed in 2023 for the collectors as well.

SC I.1.2. and 3, restrict the various species of particulate matter. SC VI.1.e. is the associated monitoring and recordkeeping requirement that requires the plant to calculate a monthly average of PM, PM10 and PM2.5 emissions. The monthly averages for September 2022, January 2023, and April 2023 were as follows:

EU-PSANDCASTLINE					
			I1 / VI1e	I2 / VI1e	I3 / VI1e
			PM	PM-10	PM-2.5
Emission Factors			0.14	0.57	0.57
Stack Test Ref					MW049AS-007179-RT-82
			lb/hr	lb/hr	lb/hr
Month	Year	PSAND Castline Hours	Tons PM/Month	Tons PM-10/Month	Tons PM2.5/Month
Jan	2022	191	0.0134	0.0544	0.0544
Feb	2022	267	0.0187	0.0761	0.0761
Mar	2022	313	0.0219	0.0892	0.0892
Apr	2022	241	0.0169	0.0687	0.0687
May	2022	243	0.0170	0.0693	0.0693
Jun	2022	297	0.0208	0.0846	0.0846
Jul	2022	307	0.0215	0.0875	0.0875
Aug	2022	430	0.0301	0.1226	0.1226
Sep	2022	379	0.0265	0.1080	0.1080
Oct	2021	156	0.0109	0.0445	0.0445
Nov	2021	195	0.0137	0.0556	0.0556
Dec	2021	164	0.0115	0.0467	0.0467
Total Tons/Yr		3183	0.22	0.91	0.91
Total Lbs/Yr			445.62	1814.31	1814.31
Total Avg lbs/hr			0.14	0.57	0.57
Limit			2.85	5.55	5.55
Compliant			Yes	Yes	Yes

EU-PSANDCASTLINE					
			I1 / VI1e	I2 / VI1e	I3 / VI1e
			PM	PM-10	PM-2.5
Emission Factors			0.14	0.57	0.57
Stack Test Ref					MW049AS-007179-RT-82
			lb/hr	lb/hr	lb/hr
Month	Year	PSAND Castline Hours	Tons PM/Month	Tons PM-10/Month	Tons PM2.5/Month
Jan	2023	304	0.0213	0.0866	0.0866
Feb	2022	267	0.0187	0.0761	0.0761
Mar	2022	313	0.0219	0.0892	0.0892
Apr	2022	241	0.0169	0.0687	0.0687
May	2022	243	0.0170	0.0693	0.0693
Jun	2022	297	0.0208	0.0846	0.0846
Jul	2022	307	0.0215	0.0875	0.0875
Aug	2022	430	0.0301	0.1226	0.1226
Sep	2022	379	0.0265	0.1080	0.1080
Oct	2022	373	0.0261	0.1063	0.1063
Nov	2022	259	0.0181	0.0738	0.0738
Dec	2022	253	0.0177	0.0721	0.0721
Total Tons/Yr		3666	0.26	1.04	1.04
Total Lbs/Yr			513.24	2089.62	2089.62
Total Avg lbs/hr			0.14	0.57	0.57
Limit			2.85	5.55	5.55
Compliant			Yes	Yes	Yes

EU-PSANDCASTLINE					
			I 1 / VI 1 e	I 2 / VI 1 e	I 3 / VI 1 e
			PM	PM-10	PM-2.5
Emission Factors			0.14	0.57	0.57
Stack Test Ref					MW049AS-007179-RT-82
			lb/hr	lb/hr	lb/hr
Month	Year	PSAND Castline Hours	Tons PM/Month	Tons PM-10/Month	Tons PM2.5/Month
Jan	2023	304	0.0213	0.0866	0.0866
Feb	2023	326	0.0228	0.0929	0.0929
Mar	2023	309	0.0216	0.0881	0.0881
Apr	2023	282	0.0197	0.0804	0.0804
May	2022	243	0.0170	0.0693	0.0693
Jun	2022	297	0.0208	0.0846	0.0846
Jul	2022	307	0.0215	0.0875	0.0875
Aug	2022	430	0.0301	0.1226	0.1226
Sep	2022	379	0.0265	0.1080	0.1080
Oct	2022	373	0.0261	0.1063	0.1063
Nov	2022	259	0.0181	0.0738	0.0738
Dec	2022	253	0.0177	0.0721	0.0721
Total Tons/Yr		3762	0.26	1.07	1.07
Total Lbs/Yr			526.68	2144.34	2144.34
Total Avg lbs/hr			0.14	0.57	0.57
Limit			2.85	5.55	5.55
Compliant			Yes	Yes	Yes

SC I.6 restricts NOx emissions to 15.21 ton per year (tpy) based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.1.f. is the the associated monitoring and recordkeeping requirements for maintaining the monthly and 12-month rolling emission records. For the 12-month rolling time period ending June 2023 the NOx emissions were 2.20 tpy.

The plant is required to monitor and record the natural gas usage monthly and on a 12-month rolling time period as determined at the end of each month. For the 12-month rolling time period ending June 2023 the plant used 50.0 MMCF of natural gas in the main chamber of the RTO.

EU-PSANDSH

This unit was formerly identified as EU-PSANDSCCSH. This emission unit consists of the scrap core sand handling equipment downstream of EU PSANDCASTLINE, EU PSANDCOREROOM and EU FINISH. It includes the Pre-Crusher, Didion Drum, Sand Transport Hoppers, and Pre-Reclaim Sand Silo. Most of the scrap core sand process in EU-PSANDSH comes from the shakeout system at the end of EU PSANDCASTLINE. The rest of the scrap core sand processed in EU-PSANDSH, coming from EU PSANDCOREROOM and EU FINISH, and are introduced through the Pre-Crusher. Scrap core sand is then broken down in the Didion Drum, before being conveyed to sand hoppers and pneumatically transferred to the Pre-Reclaim Sand Silo of EU PSANDPROCESS.

This emission unit is controlled by a 35,000 scfm fabric filter collector and is CAM subject for particulate.

On September 1-2, 2021, GM SMCO performed a sack test performed on EU-PSANDSCCSH. Stack test results indicate VOC emissions for EU-PSANDSCCSH

were 6.46 pounds per hour (lb/hr) and in excess of the 3.99 lb/hr VOC emissions limit contained in special condition I.4.

As a result of this failure, on July 28, 2022, Saginaw Metal Casting Operations of General Motors, LLC entered into ACO with the Air Quality Division to resolve VOC violations. Specifically, GM SMCO exceeded the VOC emission limit from EU-PSANDSH (formerly EU-PSANDSCCSH). Paragraph 9A. of ACO 2022-11 requires that on and after the effective date of this Consent Order, the Company shall comply with the VOC emission limits for EU-PSANDSH as specified in Condition I.4 of MI-ROP-B1991-2021b, as amended, for each emission unit.

In an attempt to resolve the violation, GM SMCO applied for PTI 36-12L which redefined the emission units by routing the existing conveyors in EU-PSANDSCCSH to EU PSANDCASTLINE. The change was initiated because EU PSANDCASTLINE is controlled by an RTO which has a 95% VOC control efficiency. The name subsequently was changed to EU-PSANDSH since the Sand Core Cooling (SCC) will be a part of EU-PSANDCASTLINE. The re-routing of emissions to the RTO caused smoke and fugitive emissions were observed in the SMCO basement because the EU -PSANDCASTLINE RTO was not able to exhaust the additional airflow from the sand handling conveyor ducts. This presented an employee health and safety hazard. As a result of these issues, GM applied for PTI36-12M and requested to change the conveyor duct back to the original installation configuration, as a part of EU-PSANDSH. Since the conveyor re-routing did not reduce VOC emissions on EU-PSANDSH, GM also increased their VOC emission limit at EU-PSANDSH stack SV-Z02-BH-6 to 8.24 lb/hr.

Stack testing was performed on April 12, 2022, during negotiations of ACO 2022-11 and showed compliance with the 14.88 pph VOC emission limit. This testing was performed to meet the requirements of SC V.2.

SC I.1.2. and 3, restrict the various species of particulate matter. SC VI.1.b. is the associated monitoring and recordkeeping requirement that requires the plant to calculate a monthly average of PM, PM10 and PM2.5 emissions. The monthly averages for September 2022 and April 2023 were as follows:

EU-PSANDSH					
Stack Z02-BH 6					
			I 1 / VI 1 b	I 2 / VI 1 b	I 3 / VI 1 b
			PM	PM10	PM2.5
Emission Factors			0.07	0.22	0.22
Stack Test Ref			MW049AS-007179-RT-827		
		III 1 VI.1.a	lbs/hr	lbs/hr	lbs/hr
Month	Year	Sand Handling Hours	Tons PM/Month	Tons PM10/Month	Tons PM2.5/Month
Jan	2023	162	0.0057	0.0178	0.0178
Feb	2022	142	0.0050	0.0157	0.0157
Mar	2022	143	0.0050	0.0157	0.0157
Apr	2022	116	0.0040	0.0127	0.0127
May	2022	106	0.0037	0.0116	0.0116
Jun	2022	112	0.0039	0.0123	0.0123
Jul	2022	111	0.0039	0.0122	0.0122
Aug	2022	184	0.0064	0.0202	0.0202
Sep	2022	192	0.0067	0.0212	0.0212
Oct	2022	214	0.0075	0.0235	0.0235
Nov	2022	161	0.0056	0.0177	0.0177
Dec	2022	162	0.0057	0.0179	0.0179
Total Tons/Yr		1805	0.06	0.20	0.20
Total Lbs/Yr			126.33	397.03	397.03
Total Avg lbs/hr			0.07	0.22	0.22
Limit		5300	2.36	4.73	4.73
Compliant		Yes			

EU-PSANDSH					
Stack Z02-BH 6					
			I 1 / VI 1 b	I 2 / VI 1 b	I 3 / VI 1 b
			PM	PM10	PM2.5
Emission Factors			0.07	0.22	0.22
Stack Test Ref			MW049AS-007179-RT-827		
		III 1 VI.1.a	lbs/hr	lbs/hr	lbs/hr
Month	Year	Sand Handling Hours	Tons PM/Month	Tons PM10/Month	Tons PM2.5/Month
Jan	2023	162	0.0057	0.0178	0.0178
Feb	2023	157	0.0055	0.0172	0.0172
Mar	2023	179	0.0062	0.0196	0.0196
Apr	2023	146	0.0051	0.0161	0.0161
May	2022	106	0.0037	0.0116	0.0116
Jun	2022	112	0.0039	0.0123	0.0123
Jul	2022	111	0.0039	0.0122	0.0122
Aug	2022	184	0.0064	0.0202	0.0202
Sep	2022	192	0.0067	0.0212	0.0212
Oct	2022	214	0.0075	0.0235	0.0235
Nov	2022	161	0.0056	0.0177	0.0177
Dec	2022	162	0.0057	0.0179	0.0179
Total Tons/Yr		1885	0.07	0.21	0.21
Total Lbs/Yr			131.96	414.74	414.74
Total Avg lbs/hr			0.07	0.22	0.22
Limit		5300	2.36	4.73	4.73
Compliant		Yes			

SC III.1. restricts operation of the rotary drum in EU-PSANDSH to less than 5,300 hours for a 12-month rolling time period as determined at the end of each calendar month. PSANDSH operated 2,029 hours for the 12-month rolling time period ending June 2023.

SC IV.1. restricts operation of EU-PSANDSH unless the fabric filter collector installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the fabric filter collector requires a pressure drop range between 0.1 and 10 inches of water column. The minimum pressure drop shall not be less than 1 inch, water gauge, except upon bag replacement or other reason acceptable to the AQD. SC VI.1.c. is the associated monitoring and recordkeeping requirement to monitor the fabric filter as defined in the MAP. I reviewed the differential pressure for the fabric filter for the months of April and September 2022. The pressure differential was in compliance range during these periods of operation. Additionally, the MAP requires weekly opacity checks on the stack associated with this emission unit. I reviewed opacity checks for May 2022 through June 2023. No opacity was observed, on any of the stacks, during these time periods. During the inspection we observed the pressure differential on the local readout at 4.61 "W.C.

EU-FINISH

This unit is utilized by both the precision sand (PS) and semi-permanent molding (SPM) operations. This process removes excess metal and residual sand from the casting. Emissions are controlled by cartridge collectors with air flow rates of 12,800

scfm total for the deflash, decore, and degate enclosures from PS and SPM molding operations. There is a 1,500 sfm unit for the shot blast cabinet associated with the PS finishing. The self-contained water blast cabinet associated with PS finishing uses a mist eliminator which is vented in-plant.

We viewed the monitoring parameters for this unit during the tour of the facility and the differential pressure for SV-Z03-CC-01 was 0.05 "W.C. and not in operation. The MAP defines proper operating values, for both units, between 0.1-10.0 "W.C. I reviewed differential pressure records from July 2022 through June 2023. During times of operation the pressure differential was in the appropriate range.

The facility maintains monthly average records for PM, PM10 and PM2.5. I viewed records for the months of June 2022 through June 2023. PM emissions for deflash, decore, and degate were as follows:

EU-FINISH					
Stack SV-Z05-CC-1			I 1 / VI 1 a	I 2 / VI 1 a	I 3 / VI 1 a
			PM	PM10	PM2.5
Emission Factors			0.86	0.86	0.86
			lbs/hr	lbs/hr	lbs/hr
Month	Year	Stack Hours	Tons PM/Month	Tons PM10/Month	Tons PM2.5/Month
Jan	2023	416	0.1789	0.1789	0.1789
Feb	2023	401	0.1724	0.1724	0.1724
Mar	2023	396	0.1703	0.1703	0.1703
Apr	2023	360	0.1548	0.1548	0.1548
May	2023	440	0.1892	0.1892	0.1892
Jun	2023	488	0.2098	0.2098	0.2098
Jul	2022	561	0.2412	0.2412	0.2412
Aug	2022	528	0.2270	0.2270	0.2270
Sep	2022	571	0.2455	0.2455	0.2455
Oct	2022	570	0.2451	0.2451	0.2451
Nov	2022	462	0.1987	0.1987	0.1987
Dec	2022	377	0.1621	0.1621	0.1621
		5570			
		Total Tons/Yr	2.40	2.40	2.40
		Total lbs/Yr	4790.20	4790.20	4790.20

EU-FINISH					
Stack SV-Z05-CC-1			I 1 / VI 1 a	I 2 / VI 1 a	I 3 / VI 1 a
			PM	PM10	PM2.5
Emission Factors			0.86	0.86	0.86
			lbs/hr	lbs/hr	lbs/hr
Month	Year	Stack Hours	Tons PM/Month	Tons PM10/Month	Tons PM2.5/Month
Jan	2023	416	0.1789	0.1789	0.1789
Feb	2023	401	0.1724	0.1724	0.1724
Mar	2023	396	0.1703	0.1703	0.1703
Apr	2023	360	0.1548	0.1548	0.1548
May	2023	440	0.1892	0.1892	0.1892
Jun	2023	488	0.2098	0.2098	0.2098
Jul	2022	561	0.2412	0.2412	0.2412
Aug	2022	528	0.2270	0.2270	0.2270
Sep	2022	571	0.2455	0.2455	0.2455
Oct	2022	570	0.2451	0.2451	0.2451
Nov	2022	462	0.1987	0.1987	0.1987
Dec	2022	377	0.1621	0.1621	0.1621
		5570			
		Total Tons/Yr	2.40	2.40	2.40
		Total lbs/Yr	4790.20	4790.20	4790.20

Cartridge collectors were last inspected on April 18, 2023. The inspection appears to have consisted of a monthly mechanical and electrical inspection, which had no follow up work required.

EU-SPMALUMINUM

This emission unit is a natural gas-fired stack melter aluminum melting/holding furnace for aluminum/alloy production using "clean charge" with flux addition, drossing, and degassing well (argon). The melt rate is 5.5 ton per hour (tph) and 4.25 MMBtu/hr heat input rate in holding operational mode. The electrically heated launder systems are vented in-plant as well as the four electric ladle furnaces with degassing (argon) capability and flux addition.

Emissions from the launder system, ladle furnaces and holding furnace are released to the internal plant environment. Prior to PTI 36-12I emissions were routed to a 33,000 scfm fabric filter collector. PTI 36-12I removed the requirements for the collector, because GM demonstrated, using stack test data, that this unit could meet PM limits prior to the collector.

SC I.6 restricts NOx emissions to 9.55 tpy based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.1.d is the associated monitoring and recordkeeping requirement to maintain NOx emissions data on a monthly and 12-month rolling time period. NOx emissions for the 12-month rolling time period ending June 2023 was 0.73 tpy.

Tons of metal fed/charged is limited to 5.5 tph based on a monthly average. Charge rates ranged from 1.86 tph in July 2022 to 3.13 tph in May 2023. Total flux usage (total injection flux and broadcast flux) are limited to 7,332 pounds per 12-month rolling time period. Total flux usage for the 12-month rolling time period ending June 2023 was 1,100 lbs/yr. The facility is also restricted on the number of hours the stack melting/holding furnace can be operated as a melting furnace, to less than 6,032 hours per 12-month rolling time period. For the 12-month rolling time period ending June 2023 the facility operated the stack melter as a melting furnace for 5,412 hours. Natural gas usage was 51.70 MMCF for this same time period.

PM, PM10 and PM2.5 monthly average, emissions, are maintained and were below permitted values.

EU-SPMPROCESESSAND

This emission unit performs sand processing by utilizing a 120-ton new sand storage silo with bin vent filter receives sand via blower truck and a 30-ton pre-reclaim sand silo receives process sand recovered in the facility. Sand from both silos is transported to the natural gas fired fluidized bed sand reclaim process system (sand reclaim furnace, sand cooler, sand screen, and deduster) (design heat input rate is 4 MMBtu/hr) for cleaning and preparation of sand. From there, sand is transferred to the prepared sand silo.

Top core, scrap cores, broken cores and process sand collected from EU-SPMCASTLINE and EU SPMCASTLINE4 and scrap cores and process sand from EU-SPMCOREROOM are collected in a bin/hopper and taken to a sand load out station

for reclaim or returned to the process by the receiving dump chute of EU SPMPROCESSAND for transport by conveyor to the hopper/storage silo of EU-SPMPROCESSAND. PM emissions from these sand handling processes and EUSPMCASTLINE4 and sand handling transfer points including the pre-reclaim sand silo, sand transfer system, fluidized bed sand reclaim, and prepared sand silo in EU-SPMPROCESSAND are controlled by a single 34, 000 scfm fabric filter collector. There is no emission control on the remaining sand handling or transfer points (bin/hopper, sand load out station, receiving dump chute).

Testing for this unit was performed the week of this records request, November 1 through 5, 2021. Stack testing was performed to verify visual emissions (VE), PM and VOC emission rates. VE and PM testing requirements were part of the PTI requirements. VOC testing was requested in a letter sent late September 2021 under the authority authorized in R 336.2001(1)(e). PM emissions tested at 5.05 pph with a limit of 0.19 pph. The results from the November 2021 test are in Table 1-3 below.

On July 28, 2022, Saginaw Metal Casting Operations of General Motors, LLC entered into an ACO with the Air Quality Division to resolve this particulate matter (PM) violation and VOC violation. Specifically, GM SMCO exceeded the PM emission limit from EU-SPMPROCESSAND and failed to account for VOC emissions from the core sand in the initial PTI 36-12 for EU-SMPROCESSSAND. Paragraph 9B. of ACO 2022-11 requires that on and after the effective date of this Consent Order, the Company shall comply with the VOC emission limits for EU-SPMPROCESSAND as specified in Condition I.9 of MI-ROP-B1991-2021 b, as amended, for the emission unit. Paragraph 9C. of ACO 2022-11 requires that on and after the effective date of this Consent Order, the Company shall comply with the PM emission limits for EU-SPMPROCESSAND as specified in Condition I.6 of MI-ROP-B1991-2021 b, as amended. Maintenance activities were performed to correct the PM exceedance and subsequent testing was performed on February 23 and 24, 2022. Results, as shown in Table 1-2 below, indicated compliance with the PM limit.

As part of the compliance plan for the ACO, Paragraph 11, requires installation of a Bag Leak Detection System (BLDS) for the EU-SPMPROCESSAND fabric filter collector by July 28, 2023. GM provided notification of installation of the BLDS on July 25, 2023. During the inspection we viewed the unit installed downstream of the baghouse. The baseline was established at 3.0 picoamps (pA). We observed the chart recorded and the observed value was 0.0 milliamp (mA). The logger converts the value from pA to mA and records data every second and provides a 6-minute average to assess against. The range of the instrumentation is so large relative to the value being measured the graph appears to flatline at 0.0 milliamp. However, the actual value can be checked on the live readout in the software. We viewed the data logger and the value was 0.0 mA too. The ACO further requires testing of the associated baghouse within twenty-four (24) and thirty (30) months after the effective date of the ACO (intent was to have performed at BLDS was installed), which corresponds to July 28, 2024 and January 28, 2025.

Similar to EU-PSANDPROCESS, the new core sand storage silo associated with EU-SPMPROCESSAND has a bin vent filter. SC I.1 restricts visible emissions from the new sand storage silo to zero emissions as observed via Method 22 on an annual basis. SC VI.1.f. is the associated monitoring and recordkeeping requirement that requires the plant to view the presence or absence of visible emissions from the bin vent filters during loading of sand into the silo as determined by an observer using EPA Method 22. PTI 36-12K revisions allowed the plant to accept spent sand from the Defiant, Ohio plant for reclaim. The plant regenerates the Defiant sand and utilizes in their process and new sand has not been loaded into the sand silo since February 2023. The silo is used frequently only when the thermal sand reclaim unit is down for extensive repair or servicing. During the inspection we viewed the location of the bin vents. They exhaust internal to the building, which presents a problem for performing a Method 22. Picture of the bin vents are attached to this report. For the purposes of this inspection, I did not review compliance with this condition. GM SMCO plans to revise this condition during their next PTI application.

SC I.2. limits VE from the fluidized bed sand reclaim to 10 percent opacity based on a 6-minute average. SC V.1. is the associated testing requirement to verify this limit is being met. Testing for this unit was performed the week of this records request, November 1 through 5, 2021. Test results are in Table 1-3 above.

SC I.3 through 8., restrict the various species of particulate matter. SC VI.1.c. is the associated monitoring and recordkeeping requirement that requires the plant to calculate a monthly average of PM, PM10 and PM2.5 emissions. The monthly averages for June 2022 through June 2023 were in compliance with the limits.

EU-SPMPROCESSAND

SPM PROCESS RECLAIM UNITS

Stack Z02-BH-4

					Sand & Gas	Sand	Gas			VI 1 c Sand	Gas		
					PM	PM-10				PM-2.5			
Emission Factors					0.126	0.54	7.60			0.54	7.60		
EF Basis					MW023AS-014023-RT-1302	PTI Application	AP42			PTI Application	AP42		
				I 6 / VI 1 c	lbs/hr	lb/ton 98.5% (CF)	lbs/mmcf	I7 / VI 1 c		lb/ton 98.5% (CF)	lbs/mmcf	I 8 / VI 1 c	
Month	Year	Hours	MMCF	PM lbs/Hour	Tons PM/Month	lb/PM-10/hour Sand	lbs PM 10 / hour GAS	Total hourly PM 10	Tons PM 10 / Month	lbs PM2.5/hour Sand	lbs PM 2.5 / hour GAS	Total hourly PM 2.5	Tons PM 2.5 / Month
Jan	2023	500	1.171	0.126	0.03	0.01	0.02	0.029	0.007	0.011	0.018	0.029	0.007
Feb	2023	556	1.140	0.126	0.04	0.01	0.02	0.026	0.007	0.011	0.016	0.026	0.007
Mar	2023	491	1.165	0.126	0.03	0.01	0.02	0.032	0.008	0.014	0.018	0.032	0.008
Apr	2023	460	0.954	0.126	0.03	0.01	0.02	0.027	0.006	0.012	0.015	0.027	0.006
May	2023	608	1.002	0.126	0.04	0.01	0.01	0.024	0.007	0.011	0.013	0.024	0.007
Jun	2023	616	1.271	0.126	0.04	0.01	0.02	0.028	0.009	0.012	0.016	0.028	0.009
Jul	2022	486	1.217	0.126	0.03	0.01	0.02	0.029	0.007	0.010	0.019	0.029	0.007
Aug	2022	680	1.569	0.126	0.04	0.01	0.02	0.027	0.009	0.010	0.018	0.027	0.009
Sep	2022	520	1.352	0.126	0.03	0.01	0.02	0.034	0.009	0.014	0.020	0.034	0.009
Oct	2022	843	1.617	0.126	0.05	0.01	0.01	0.024	0.010	0.010	0.015	0.024	0.010
Nov	2022	568	1.633	0.126	0.04	0.01	0.02	0.035	0.010	0.013	0.022	0.035	0.010
Dec	2022	501	1.203	0.126	0.03	0.01	0.02	0.030	0.007	0.011	0.018	0.030	0.007
	Total Tons/Yr				0.43				0.10				0.10

SC I.11 restricts NOx emissions to 1.53 tpy based on a 12-month rolling time period as determined at the ed of each calendar month. SC VI.1.d. is the associated monitoring and recordkeeping requirement that requires the plant to record monthly and 12-month rolling time period as determined at the end of each calendar month NOx emissions. For the time period ending June 2023 the NOx emissions were 0.76 tpy.

SC II.1. limits new and recovered core sand throughput to 27,891 tons based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.1.a. is the associated monitoring and recordkeeping requirement that requires the plant to maintain on a monthly and 12-month rolling time period, as determined at the end of each calendar month, the sand throughput rate in EU-SPMPROCESSAND. For the 12-month time period ending June 2023 the plant processed 8,965 tons of sand.

The emission unit only burns natural gas. SC III.2. restricts the amount of hours each natural gas fired fluidized bed sand reclaim process unit in EU-SPMPROCESSAND can burn natural gas to 7,800 hours based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.1.g. is the associated monitoring and recordkeeping requirement that requires the plant to record monthly and 12-month rolling time period as determined at the end of each calendar month, the natural gas usage rate. For the time period ending June 2023, the fluidized bed sand reclaim operated for 6,829 hours.

SC IV.1. requires the fabric filter collector to be installed, maintained, and operated in a satisfactory manner. The MAP, as required by SC VI.1.e, defines satisfactory operation of the fabric filter dust collector as a pressure drop range between 0.5 and 10 inches of water column. The minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced. I reviewed pressure drop records for the months of January 2023, April 2023 and September 2022. Filters were replaced in April 2023. Found holes using the

plumbob detection method and decided to replace all bags as a proactive measure. Bags were only in service one year. Differential pressure was in the approved range during times of operation. During the inspection the differential pressure was 2.89 "W.C. on baghouse Z02-BH4.

SC VI.1.b. requires the plant to record natural gas usage on a monthly and 12-month rolling time as determined at the end of each calendar month. The unit operated as follows for the 12-month rolling time period ending June 2023.

Permit Ref	Data Source	Process/Emission Unit	Throughput Material	JAN 2023	FEB 2023	MAR 2023	APR 2023	MAY 2023	JUN 2023	JUL 2022	AUG 2022	SEP 2022	OCT 2022	NOV 2022	DEC 2022	12 Month Rolling Total
VI.1b	Plant Gas Meters	EU-SPMPROCESSAND Reclaim (Heads)	Natural Gas Usage (MMCF)	1.17	1.14	1.17	0.95	1.00	1.27	1.22	1.57	1.35	1.62	1.63	1.20	15.3

SC VI.2. restricts operation of EU-SPMPROCESSAND unless a MAP is implemented and maintained. According to the MAP dated March 15, 2022 the pressure gauges on the fabric collectors are calibrated annually and an inspection of the baghouse consists of a quarterly check for sand on the clean side of the fabric filter collector and check bag integrity. Maintenance records indicate the collectors are being maintained accordingly. The facility is required to submit an MAP within 60 days of BLDS installation (September 22, 2023).

EU-SPMCOREROOM

The core room processes include sand handling and mixing via both conveyor and pneumatic systems. Sand and two-part epoxyacryclic resin mixing occurs. Prepared sand is transported to and received into the central sand hopper and mixer located above the core machines. The core is made using a sulfur dioxide co-reactant injection system which supplies mixed sulfur dioxide for the three cold box core machines. Core box tooling maintenance process is included in this unit and includes the use of a core release chemical, metal cleaner, a high-pressure water wash and core box washing station. The high-pressure water and core box washing station is also utilized by EU-PSANDCOREROOM. Scrap cores and process sand are placed in bins or hoppers and taken to a sand load out station for reclaim. Sand is added to the process by the receiving dump chute of EU-SPMPROCESSSAND. Fugitive emissions occur from storage of completed cores in a core buffer area that produces off-gassing emissions, which are released to the general ventilation system for the facility.

Emissions from the final sand transport, sand hopper, and mixer are controlled by a 5,000 scfm cartridge collector. Emissions from the core making machines are controlled by a cyclone and a packed tower caustic scrubber with a 20,000 scfm exhaust gas flow rate.

We viewed the caustic scrubber and cartridge collector during the facility tour. Control device operating parameters, at the time of the inspection, are listed in the table below. The scrubber has two pH probes installed as a redundancy, only one value was recorded.

EU/FG	CONTROL ID	Process/Operational Restrictions	OBSERVED VALUES
EU-SPMCOREROOM sand handling and mixing	Z-05-CC2	ΔP 0.1-10 "W.C.	1.13 " W.C.
EU-SPMCOREROOM core making processes ducted to acid scrubber	Z05-ISO-02	ΔP 0.1-12 "W.C.	2.30 "W.C
	Z05-ISO-02	> 390 gpm	400 gpm
	Z05-ISO-02	pH >7.5	11.7

SC I.10. restricts VOC emissions from the core box, core box machine cleaning, and core making areas of EU-SPMCOREROOM, based on a 12-month rolling time period determined at the end of each calendar month. VOC emissions and restrictions for the 12-month rolling time period ending June 2023 are listed in the table below.

Pollutant	Equipment	Limit	June 2023 12-month rolling emissions
VOC	Core Box of EU-SPMCOREROOM	3.72 tpy	1.45 tpy
VOC	Core Box Core Machine cleaning (fugitives)	14.17 tpy	0.05 tpy
VOC	Core Making (fugitives)	4.96 tpy	1.94 tpy

All species of PM have pound per hour emission limitations. PM, PM10 and PM2.5 emissions are monitored and recorded a monthly average recorded. Records were below permitted levels.

EU – SPMCOREROOM, PM, PM10 & PM2.5 Monthly Avg. Emissions in pph for June 2022 through June 2023

EU-SPMCOREROOM					
SPM CORE Box (SCRUBBER (SO2))					
Stack Z05 ISO 2			I 5 / VI 1 a	I 6 / VI 1 a	I 7 / VI 1 a
			PM	PM-10	PM-2.5
Emission Factors			0.45	0.45	0.45
EF Basis			Permit	Permit	Permit
			pph	pph	pph
Month	Year	Hours	Tons PM/Month	Tons PM-10/Month	Tons PM2.5/Month
Jan	2023	613	0.1379	0.1379	0.1379
Feb	2023	697	0.1568	0.1568	0.1568
Mar	2023	648	0.1458	0.1458	0.1458
Apr	2023	510	0.1148	0.1148	0.1148
May	2023	800	0.1800	0.1800	0.1800
Jun	2023	834	0.1876	0.1876	0.1876
Jul	2022	483	0.1087	0.1087	0.1087
Aug	2022	689	0.1550	0.1550	0.1550
Sep	2022	731	0.1645	0.1645	0.1645
Oct	2022	785	0.1767	0.1767	0.1767
Nov	2022	705	0.1586	0.1586	0.1586
Dec	2022	613	0.1379	0.1379	0.1379
Total Tons/Yr		8107.90	1.82	1.82	1.82
Total Avg lbs/hr			0.45	0.45	0.45
Limit			0.45	0.45	0.45

SC II.1. limits the amount of SO_2 catalyst to 307 tons SO_2 catalyst per year, based on a 12-month rolling time period as determined at the end of each calendar month. For the 12-month rolling time period ending June 2023 the plant used 155 tpy of SO_2 catalyst.

In addition to monitoring the various control parameters required by the MAP in SC VI.2 the plant is required to maintain a complete preventative maintenance plan. Monthly mechanical and electrical inspections were last performed July 17, 2023.

The facility said cartridge changes are performed in response to differential pressure out of range or mechanical inspection PMs/workorders. Maintenance does not generate a separate workorder to record/track the cartridge replacement. Therefore, unless it was documented in the mechanical inspection workorder or logged into the maintenance end of shift notes, the activity is not recorded. I reviewed the differential trend for the cartridge collector. The DP trending can be indicative of filter changes as DP drops and trending becomes much less linear. The trend indicated a cartridge change on February 26, 2023, for collector Z05-CC-02.

EU-SPMCASTLINE

This emission unit consists of three cast lines with a nominal maximum combined production rate of 106 castings per hour (2,460 castings per day) and a nominal maximum production rate of 53 castings per hour on any single casting line. Each

line entails making a final mold, which includes mold and core assembly and mold heating with natural gas fired (16MMBtu/hr) burners/torches. Mold filling is conducted by gravity pour. The initial cooling and solidification of the molten metal occurs inside the mold. Extraction of the casting (including sand cores) from the steel mold is completed by the casting extraction unload robot. Top core and down sprue removal. Additional cooling and complete solidification occur in the casting solidification buffer area. Three identical modular units extended casting cooling in the cooling garage. During the tour of the facility, we viewed the cooling garages and discussed the cooling time was approximately 1.5-2 hours. Two identical modular units include deflas, decore and degate. Finishing operations include three removal of excess metal and sand from the casting (EU-FINISH). Metal removed from the casting is collected and transported to thermal sand pre-reclaim silos via the pneumatic transport system and the scrap remelt (runner, riser and gating) for SPM go into the stack melter.

Coating emissions are controlled by a 13,000 scfm cartridge collector. Emissions from each cast line in sections 1 and 2 are controlled by three, 60,000 scfm fabric filter collectors. Combined emissions from section 3 of both cast lines and precision sand finishing operations are routed to a 12,800 scfm cartridge collector (EU-FINISH). Decoating emissions are routed to a 7,500 scfm cartridge collector and then vented to the in-plant environment.

This unit is subject to CAM requirements, because each of the control devices have pre-controlled PM emissions greater than 100 tpy. The CAM plan monitoring requirements are for differential pressure on the (3) three, 60,000 scfm fabric filter collectors. The facility continuously monitors the pressure drop and during the walkthrough of the facility the differential pressures were as follows:

EU/FG	Control ID	Process/Operational Restrictions	Observed Values
EU-SPMCASTLINE castlines 1,2,3	Z05-BH-01	ΔP 0.1-10 "W.C.	This line has been shutdown with no intention of coming back online.
	Z05-BH-02	ΔP 0.1-10 "W.C.	
	Z05-BH-03	ΔP 0.1-10 "W.C.	4.5 "W.C.
EU-SMPCASTLINE - mold coating	Z05-CC-04	ΔP 0.1-10 "W.C.	3.44 "W.C.

I reviewed pressure differentials from June 2022 through June 2023. The pressure differentials were within the appropriate range during times of operation.

NOx emissions are limited to 1.03 tpy, for offline mold, based on a 12-month rolling time period as determine at the end of each calendar month. For the 12-month rolling time period ending June 2023, NOx emissions were 0.26 tpy. Sections 1 & 2

and all three cast lines combined including mold preheating are limited to 1.41 tpy NOx emissions. For the 12-month rolling time period ending June 2023, NOx emissions were 0.12 tpy.

The facility maintains CO, PM, PM10 and PM2.5 monthly averages of emissions. I viewed monthly records for June 2022 through June 2023. Emissions were below permitted values.

SPM CAST SECTION 1 AND 2			I 2 / VI 1 b	I 3 / VI 1 b	I 4 / VI 1 b	I 8 / VI 1 b
			PM	PM-10	PM-2.5	CO
Emission Factors			1.56	1.56	1.56	1.32
Stack Test Ref			11/15/22 stack test email	11/15/22 stack test email	11/15/22 stack test email	15-4755
			lb/hr	lb/hr	lb/hr	lb/hr
Month	Year	Hours	PM Tons/Month	PM-10 Tons/Month	Tons PM2.5/Month	Tons CO/Month
Jan	2023	177	0.1384	0.1384	0.1384	0.1171
Feb	2023	190	0.1484	0.1484	0.1484	0.1256
Mar	2023	223	0.1738	0.1738	0.1738	0.1470
Apr	2023	172	0.1341	0.1341	0.1341	0.1135
May	2023	219	0.1706	0.1706	0.1706	0.1443
Jun	2023	241	0.1881	0.1881	0.1881	0.1592
Jul	2022	149	0.0401	0.0401	0.0401	0.0983
Aug	2022	212	0.0572	0.0572	0.0572	0.1399
Sep	2022	226	0.0611	0.0611	0.0611	0.1493
Oct	2022	264	0.0713	0.0713	0.0713	0.1743
Nov	2022	234	0.1828	0.1828	0.1828	0.1547
Dec	2022	180	0.1401	0.1401	0.1401	0.1185
	2487.5	Total Tons/Yr	1.51	1.51	1.51	
		Limit (tpy)				
	I 7	Compliant				
Hours are comprehended as all hours of operation for all 3 castlines						
Includes gas emission from bench preheat torches						
our through unload						
Updated Stack Test in November 2022 from 11/15/22 email from Alex Thibeault.						

SC II.1. restricts the amount of aluminum poured to 19,412 tons per 12-month rolling time period as determined by the end of each calendar month. Aluminum poured for the 12-month rolling time period ending June 2023 was 7,515 tpy.

Hours of operation are restricted to 6,032 hours per 12-month rolling time period as determined at the end of each calendar month. For the 12-month rolling time period ending June 2023 EU-SPMCASTLINE operated for 2,487.5 hours.

Natural gas usage for this unit was a combined 4.5 MMCF for the 12-month rolling time period ending .

SC V.1 requires the facility to verify the PM, PM10, and PM2.5 emission rates from EU -SPMCASTILINE, no later than December 31, 2022. The test was completed September 21, 2022. Results were below the limits as demonstrated in the table below.

Continued compliance is maintained through proper operation and maintenance of the baghouses. SC VI.2. restricts operation of EU-SPMCASTLINE unless a MAP as described in Rule 911(2), for the air cleaning devices, is implemented and maintained. If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the MAP within 45 days if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the MAP and any amendments to the MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended MAP shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits. Pressure differential monitoring was discussed above. The MAP requires quarterly checks for sand on the clean side of the filter fabric collector, check bag integrity, and inspect the air pulse nozzles. The last quarterly inspection was performed May 23, 2023.

EU-SPMCASTLINE4

This emission unit is one carousel cast line with a nominal maximum production rate of 50 molds per hour. The facility refers to this unit as the GAXX line. This line consists of three sections: Section #1: making a final mold; mold filling; initial cooling; extraction; and cut sprue. Making a final mold includes mold and core assembly and mold heating with natural gas fired 16 MMBtu/hr (total heat input rate) burners/torches. Mold filling is by gravity pour. Initial cooling and solidification of the molten metal occurs inside the mold. Extraction of the casting (including sand cores) from the steel mold is completed by the casting extraction unload robot. Core and down sprue removal. Additional cooling and complete solidification occur in the casting solidification buffer area. section #2: extended casting cooling in a cooling area and section #3: Deflash; Decore; Degate. Finishing operations include the removal of excess metal and sand from the casting. Process and scrap sand generated from EU SPMCASTLINE4 is collected and transported as described in EU SPMPROCESSAND.

Emissions are controlled for section1 and section2 by (2) two 30,000 scfm fabric filter collectors. Each filter is a CAM subject device for Particulate. I viewed differential pressure for each of these sections during the viewing of monitoring parameters. The east baghouse had a differential pressure of 3.6 “W.C. and the west was operating at 0.20 “W.C. Proper operating ranges are between 0.1 and 10 “W.C. I

received printouts for June 2022 through June 2023. Differential pressures were within range for this time period and both baghouses tend to operate on the lower end of the range.

The 30,000 scfm fabric filters as subject to CAM for PM. The combined, pre-control, PM emissions are 279 tpy, which are exhausted through one combined stack. Differential pressure is the CAM monitoring parameter with the satisfactory operating range the same as identified in the MAP. An excursion is defined as the presence of visible emissions which appears to be above 5% opacity if performed using USEPA Method 9. If the pressure differential is outside of the indicator range of 0.1 to 10.0 inches based on a 3-hour rolling average, then plant staff will do a visual observation of the stack. If visible emissions are identified above 5% then the plant follows MAP corrective action. The MAP requires visible emissions to be observed weekly. I reviewed weekly visible emission observations from May 23, 2022 through July 9, 2023. No visible emissions were identified for this unit.

The MAP also states the facility will perform one of the following inspections: a semi-annual check for sand on the clean side of the fabric filter collector and check bag integrity. The maintenance records state that a baghouse filter inspection was performed in February 26, 2023.

The facility maintains CO, PM, PM10 and PM2.5 monthly averages of emissions. I viewed monthly records for June 2022 through June 2023. Emissions were below permitted values.

EU-SPMCASTLINE4						
			I 1 / VI 1 a	I 2 / / VI 1 a	I 3 / VI 1 a	I 7 / / VI 1 a
			PM	PM-10	PM-2.5	CO
Emission Factors			0.95	0.95	0.95	0.89
Stack Test Ref			049AS-451360	049AS-451360	049AS-451360	049AS-451360
			lb/hr	lb/hr	lb/hr	lb/hr
Month	Year	Hours	PM Tons/Month	PM-10 Tons /Month	Tons PM2.5 /Month	Tons CO/Month
Jan	2023	436	0.2069	0.2069	0.2069	0.1938
Feb	2023	506	0.2405	0.2405	0.2405	0.2253
Mar	2023	425	0.2020	0.2020	0.2020	0.1893
Apr	2023	338	0.1606	0.1606	0.1606	0.1505
May	2023	581	0.2760	0.2760	0.2760	0.2586
Jun	2023	593	0.2815	0.2815	0.2815	0.2637
Jul	2022	334	0.1588	0.1588	0.1588	0.1488
Aug	2022	477	0.2265	0.2265	0.2265	0.2122
Sep	2022	505	0.2399	0.2399	0.2399	0.2247
Oct	2022	521	0.2476	0.2476	0.2476	0.2319
Nov	2022	471	0.2236	0.2236	0.2236	0.2095
Dec	2022	433	0.2057	0.2057	0.2057	0.1927
	5620.4	Total Tons/Yr	2.67	2.67	2.67	2.50
		Limit				
		Compliant				
Emission Factor Notes:						
Emission factors are based on the stack test 049AS-451360 dated 10/18/18.						
Includes gas emission from bench preheat torches						
Hours are all hours of operation for 4 castline						

Tons of aluminum poured per year is limited to 12,288 tons per year based on a 12-month rolling time period as determined at the end of each month. For the 12-month rolling time period ending June 2023 the unit poured 6,950 tons of aluminum. NOx emissions from this unit for the 12-month rolling time period ending June 2023 were 0.25 tpy, which was below the permitted level of 1.41 tpy.

EU-PREMACHINING

This emission unit has multiple stations for machining to remove excess metal and for surface preparation, which includes the use of a coolant. The casting washing area uses water jets and a cleaning solution. The casting leak testing area uses compressed air.

Localize exhaust at each removal/prep machine uses a 2,000 scfm mist elimator, which is released to in-plant air. The localized exhaust at each casting washing machine uses a 2,000 scfm with mist eliminator, which is also released to general plant environment air.

No emission limits are required by the ROP for this unit. Fugitive VOC emissions on a monthly and 12-month rolling time period are required. I received emissions rates for the 12-month rolling time period ending November 2021. VOC emissions were 0.19 tpy.

EU-MACHASM

This unit has multiple stations for machining to remove excess metal and for surface preparation (includes the use of a coolant); Casting washing uses water jets and a cleaning solution; Casting leak testing uses compressed air; dry machining and assembly operations.

Emissions are localized at each removal/preparation machine, utilizing a 2,000 scfm mist eliminator, released to general in-plant exhaust. Casting washing machine, utilizes a 2,000 cfm mist eliminator, released to general in-plant exhaust.

No emission limits are required by the ROP for this unit. Fugitive VOC emissions on a monthly and 12-month rolling time period are required. I received emissions rates for the 12-month rolling time period ending June 2023. VOC emissions were 0.13 tpy.

EU-6ML-EF-02

Exhaust to Well #1&2 Furnace (Open ended duct at Launder, #1 & #2 furnace).

No pollution control devices are associated with this emission unit. Visible emissions from the #6 Mold Line are limited to less than 10 percent based on a 6-minute average. Weekly visual observations are only required when the unit is in operation. This unit did not operate in 2022.

PM-10 emissions are restricted to 13.5 tpy based on a 12-month rolling time period as determined at the end of each calendar month. PM-10 emissions for the 12-month rolling time period ending June 2023 were 0.00 tpy. This unit did not operate in 2022.

FG-6ML-ALMELT

Aluminum Reverberatory Furnace #1 (West) and Aluminum Reverberatory Furnace #2 (East). No pollution control associated with this flexible group.

This unit has not operated since 2017.

FG-FACILITYPM

This flexible group covers the particulate emissions associated with the following units:

EU 6ML-EF-02, EU-6ML-GV-01, EU-6ML-GV-02, EU-PSANDALUMINUM, EU PSANDPROCESS, EU PSANDCOREROOM, EU PSANDCASTLINE, EU SPMCASTLINE4, EU PSANDSCCSH, EU FINISH, EU SPMALUMINUM, EU SPMPROCESSAND, EU SPMCOREROOM, EU SPMCASTLINE, EU PREMACHINING, EU-MACHASM.

PM, PM10 and PM2.5 emissions are limited to 128.99, 132.94 and 132.94 tpy, respectively, based on a 12-month rolling time period as determined at the end of each calendar month. PM, PM10 and PM2.5 emissions were 16.26 tpy, 15.68 tpy, and 15.68 tpy, respectively, for the 12-month rolling time period ending June 2023.

FG-EMERGENCYRICE

The facility utilizes (3) three generators in emergency situations; EU-PATTERNSHOP, EU-FIREPUMP1, and EU-FIREPUMP2. These generators are subject to the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE), Title 40 of the Code of Federal Regulations (CFR), Part 63, Subpart ZZZZ (40 CFR 63.6580-6675). The engines are regulated as existing compression (CI) emergency RICE with a maximum site rate of less than 500 brake horsepower (HP) (EU-FIREPUMP1, EU-FIREPUMP2) and greater than 500 brake horsepower (HP) (EU-PATTERNSHOP) located at a Major Source of HAP emissions.

SC VI.2. requires the facility to maintain a record of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment. The units do not have air pollution control or monitoring equipment associated with them, therefore no records are required.

SC VI.3. requires the facility to maintain a record of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation. The units do not have air pollution control or monitoring equipment associated with them, therefore no records are required.

SC VI.4. requires the facility top maintain records of the maintenance conducted on the stationary RICE in order to demonstrate that the stationary RICE was operated and maintained according to the facility maintenance plan. The facility performed annul maintenance activities in June 2022.

SC VI.5 requires the facility to maintain records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The records must document how many hours are spent for emergency operation; including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand response operation, the owner or operator must keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response. For the time period January 2022 through June 2023, hours of operation for each of the engines

were related to maintenance and testing with the exception of 5 hours run in July 2023.

FG-EMERGENERATOR

FG-EMERGENERATOR is comprised of EU-Z02EG001, EU-Z03EG001, EU-Z06EG001, EU-Z07EG001. These engines are subject to Standards of Performance for Stationary Spark Ignition Internal Combustion Engines as found at 40 CFR Part 60, Subpart JJJJ.

NSPS JJJJ requires each engine to meet NOx, CO, and VOC emissions limitations. In lieu of annual testing the NSPS allows for a manufacturer's certification. SC VI.3c. requires the facility to maintain certification records. While on-site I viewed the certificate number for each of the engines. As part of the records request, GM SMCO sent the EPA certificate for each of the engines. Each engine is certified to meet the emission limits.

SC VI.2. requires the facility to monitor and record the total hours of operation and the hours of operation during non-emergencies for each engine covered by FG-EMERGENERATOR, on a monthly and calendar year basis, in a manner acceptable to the AQD District Supervisor. The permittee shall document how many hours are spent for emergency operation of FG-EMERGENERATOR, including what classified the operation as emergency and how many hours are spent for non-emergency operation. The generators were connected as plant emergency in December 2021 and each had a total of 17.4 hours of non-emergency operating time in 2023 and 28.9 hours of non-emergency time in 2022. These hours were for maintenance and testing.

SC VI.3.b. requires maintenance records to be maintained. The generators were connected as plant emergency in December 2021 and therefore had minimal maintenance records.

FGCOLDCLEANERS

The cold cleaner uses and aqueous solution and therefore is not required to maintain the records associated with a true cold cleaner.

Image 1(Sand Silo) : Truck loads silo via pipe.

Image 2(New Sand Silo Vent) : Silo vents to interior of building.

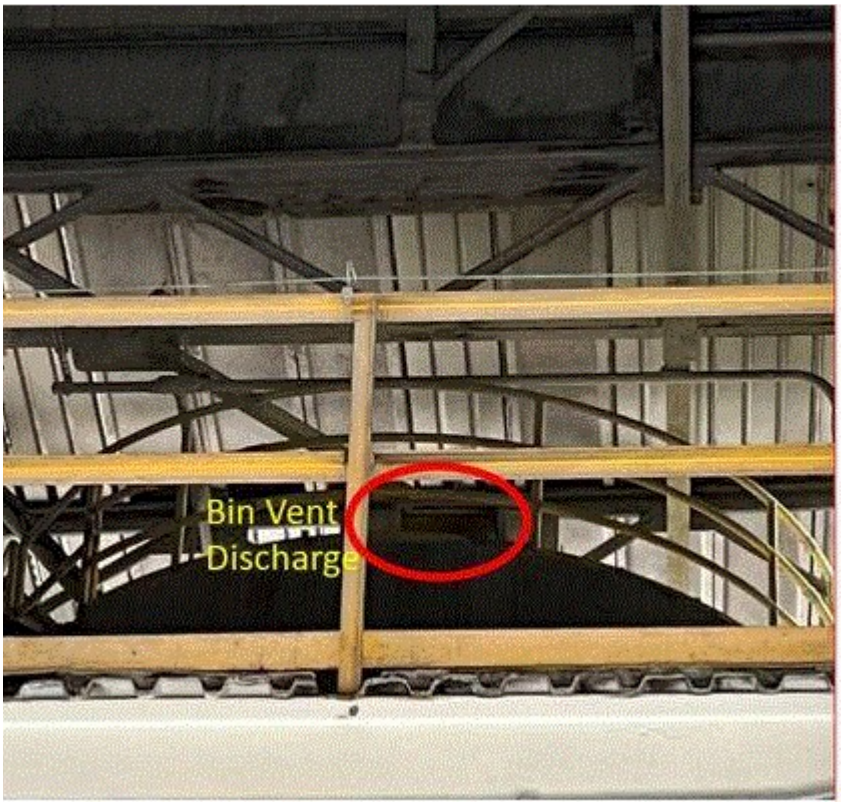

Image 3(Psand Bin Vent) : Vent internal discharge.

Image 4(SPM Bin Vent) : Bin vent discharges internally.

NAME Dina L. McFann DATE 8-21-2023 SUPERVISOR Chris Hare