

**Saginaw Metal Casting Operation (SMCO)
CAM / MAP PLAN DESCRIPTION – RTO
Date: March 24, 2021**

The information provided in this document fulfills Federal Compliance Assurance Monitoring (CAM) requirements pursuant to 40 CFR Part 64 and the State of Michigan Malfunction Abatement Plan (MAP) requirements pursuant to Rule 911 (2).

The CAM Plan can be found in Sections 1 – IV and the MAP plan can be found in Section V. This plan is applicable to the regenerative thermal oxidizer (RTO).

I. Background

A. Emissions Unit

Description: SMCO uses a RTO to control emissions from precision sand castline pouring, cooling, and shakeout processes. These processes, included in EU-PSANDCASTLINE, are summarized in Appendix A.

Facility: General Motors LLC – Saginaw Metal Casting Operations
1629 N. Washington
Saginaw, MI 48601

B. Applicable Regulation, Emissions Limit, and Monitoring Requirements

Renewable Operating Permit No. MI-ROP-B1991-2015c and pending renewal Permit to Install No. 36-12J

A summary of the CAM applicable emissions limits (VOC only) for the RTO in Appendix A.

Control Technology: This CAM/MAP plan covers CAM subject VOC emissions controlled by the RTO for EU-PSANDCASTLINE.

Monitoring Requirements:
RTO combustion chamber temperature

Potential Pre-Control Emissions: See Appendix A for the estimated potential pre-control emissions for the RTO.

II. Monitoring Parameters and Frequency; Inspection Activities; Corrective Actions

	Combustion Chamber Temperature
A. Indicator	RTO combustion temperature is measured with two thermocouples, one per combustion chamber. The average of the two readings is used for compliance with the minimum temperature required by the permit.
B. Indicator Range	> 1400 degrees F
C. ByPass System Detection	There is no bypass of the RTO. The RTO is interlocked with the cast line so that if the temperature in the RTO falls below 1400°F, the cast line can no longer pour any additional castings.

III. PERFORMANCE CRITERIA

	Combustion Chamber Temperature
A. Data Representativeness	There is a thermocouple located in each combustion chamber.
B. Verification of Operational Status	Not Applicable
C. QA/QC Practices & Criteria	Thermocouples are verified annually
D. Monitoring Frequency	Combustion temperature is monitored continuously
E. Data Collection Procedure	Combustion temperature is recorded every 15 minutes
F. Averaging Period	3-hour average to determine an excursion

IV. Justification

A. Rationale for Selection of Performance Indicators

The RTO combustion chamber temperature was selected because it is indicative of the VOC destruction occurring within the RTO and is a widely accepted method of monitoring. If the chamber temperature decreases significantly, then complete combustion may not occur, reducing the destruction efficiency.

B. Rational for Selection of Indicator Ranges

A combustion temperature greater than 1400 degrees Fahrenheit is specified in the current ROP under EU-PSANDCASTLINE. This is a generally accepted minimum temperature representing acceptable RTO performance.

An excursion from an indicator range, based on a three hour average, triggers an inspection, corrective action, and reporting, according to applicable special conditions in the permit. Corrective actions are further outlined below under the MAP section.

C. Performance Test

During 2016, a performance test was performed on the portions of EU-PSCASTLINE which are controlled by the RTO. A summary of the performance test result and indicator monitoring ranges during the test can be found in Appendix B. All results showed compliance with applicable emission limits. Copies of test report has been previously submitted AQD's Technical Programs Unit and the Bay City District Office. This testing confirms that the chosen indicator range correlates with compliance with limits. There have been no significant changes to the processes or RTO that would affect RTO performance since the testing occurred.

V. Malfunction Abatement Plan (Michigan Rule 911)

A. Preventive Maintenance Program (Rule 911(2)(a))

In general, GM will follow the preventative maintenance program recommended by the equipment manufacturer. Maintenance will be performed by SMCO maintenance personnel or outside contractors. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded.

The RTO inspections will include annual inspections of ceramic media, damper seals, burners and thermocouple accuracy.

Some replacement parts will be available in order to conduct rapid repairs, if needed. Typical spare parts include thermocouples, pressure gauges, ceramic media, gas train pressure switch, and filter/pre-filter for combustion blower. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

B. Air Cleaning operating variables (Rule 911(2)(b))

The identification of the source and air-cleaning device operating variables that will be monitored to detect a malfunction or failure, their normal operating range, and monitoring method are described in Section II above and Appendix A.

C. Corrective procedures or operational changes (Rule 911(2)(c))

Emissions in excess of a permit limit can result from a malfunction of the process or associated RTO. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant's Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Engineer shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant's Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the RTO or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant's Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant's Environmental Engineer, or designee, will contact EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

SMCO CAM/MAP Plan for Scrubbers and RTO

Revision Date
3-24-2020

Appendix A

Collector Id	Emission unit/process step	Annual controlled emission - permit basis TPY	Potential uncontrolled emission based on control efficiency TPY	CAM, MAP or Both	MAP subject emission limit	CAM subject emission limit	Emission limit value (lb/hr), unless otherwise noted	Indicator Justification	Indicator	Indicator Range
Z03-ISO-01	EU-PSANDCORERROOM/ coremaking processes ducted to acid scrubber	PM 1.53 PM10 1.53 PM2.5 1.53 VOC 22.00	PM 30.6 PM10 30.6 PM2.5 30.6 VOC 440.00 based on 95 % control	Both	PM/PM10/PM2.5	VOC	PM 0.56 PM10 0.56 PM2.5 0.56 VOC 8.10	Supplier recommendation and operating experience	Pressure drop	0.1 - 6 inches water column
									scrubber flow	> 190 gallons per minute
									pH	< 4.5
Z05-ISO-02	EU-SPMCORERROOM/ coremaking processes ducted to caustic scrubber	PM 1.36 PM10 1.36 PM2.5 1.36 VOC 3.72 SO2 16.55	PM 27.2 PM10 27.2 PM2.5 27.2 VOC 74.4 SO2 331.0 based on 95 % control	Both	PM/PM10/PM2.5 VOC	SO2	PM 0.45 PM10 0.45 PM2.5 0.45 VOC 1.23 SO2 5.49	Supplier recommendation and operating experience	Pressure drop	0.1 - 12 inches water column
									scrubber flow	> 390 gallons per minute
									pH	> 7.5
Z02-RTO-03 (see note 1)	EU-PSANDCASTLINE/ pouring, cooling and shakeout ducted to RTO	VOC emissions only pouring/cooling 2.19 shakeout 8.31	VOC emissions only pouring/cooling 43.8 shakeout 166.2 total 210.0	Both	VOC	VOC	VOC 4.07	Operating Experience	RTO combustion temperature	> 1400 degrees F

Note 1: For particulate control, the RTO is preceded by a cartridge collector for pouring and cooling and a baghouse for shakeout. Both the cartridge collector and baghouse are CAM subject for PM/PM10/PM2.5. See the CAM/MAP plan for the fabric filter collectors.

SMCO CAM/MAP Plan for Scrubbers and RTO

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Appendix B - Stack Testing Summary

Emission Unit	CAM Subject (Y/N)	Pollutants	Emission Limits (Lbs/Hr)	Test Result	Percent of Limit	Monitoring Range during test	Report date
EU-PSANDCORERROOM	Yes	DMIPA	1.77	0.022	1.24%	Pressure drop: 2 - 2.29 inches water Flow: 207 - 209 gal/min pH: 2.77 - 2.89	3/7/2016
EU- PSANDCASTLINE	Yes	PM	2.85	0.37	12.98%	Baghouse pressure drop: 0.4 - 0.50 inches water Cartridge collector pressure drop: 0.73 - 1.02 inches water RTO combustion temp: 1420 - 1463 F	1/4/2016
		PM10	5.55	0.37	6.67%		
		PM2.5	5.55	0.37	6.67%		
		NOx	4.46	1.17	26.23%		
		VOC	4.07	1.62	39.80%		
EU-SPMCORERROOM	Yes	SO2	4.82	0.07	1.45%	Pressure drop: 2.07 - 2.6 inches water Flow: 393 - 397 gal/min pH: 8.6 -12.6	2/16/2015