# Compliance Assurance Monitoring Plan

## Facility Information

November 2013, Revised November 2020

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## List of Acronyms

| | |
|---|---|
| CAM | Compliance Assurance Monitoring |
| CCI | Cadillac Castings, Inc. |
| CD | Control Device |
| CFR | Code of Federal Regulations |
| CMS | Continuous Monitoring System |
| CO | Carbon Monoxide |
| DRE | Destruction Efficiency |
| EU | Emission Unit |
| HAP | Hazardous Air Pollutant |
| Inches w. g. | Inches of Water, Gauge Pressure |
| MPAP | Malfunction, Prevention and Abatement Plan |
| NSPS | New Source Performance Standards |
| PM | Particulate Matter |
| PSEU | Pollutant-Specific Emission Unit |
| QA/QC | Quality Assurance/Quality Control |
| QIP | Quality Improvement Plan |
| RTO | Regenerative Thermal Oxidizer |
| SCFM | Standard Cubic Feet per Minute |
| SV | Stack/Vent |
| USEPA | United States Environmental Protection Agency |
| VE | Visible Emissions |
| VOC | Volatile Organic Compound |

# 1.0 Introduction

This Compliance Assurance Monitoring (CAM) Plan addresses the requirements of 40 CFR Part 64 and satisfies the CAM requirements for the Cadillac Castings, Inc. (CCI) facility located in Cadillac, Michigan.

CCI operates a ductile iron foundry in Cadillac, Michigan, under Permit Number 199700043. Equipment within the facility is grouped by process operations into emission units for permitting purposes. The emission units identified by the existing permit for CCI include:

- EUMELTING - Metal melting system consisting of the cupola, three electric holding furnaces, a desulfurization ladle, four tundish ladles, and the cupola charging system.
- EUCOREMOLDMAKING - Catalyzed core and mold making. The process uses sand, binders, and catalysts to produce cores and molds for use in the foundry.
- EUSPOPOURANDCOOL - Iron pouring process.
- EUSPOGREENSAND - Line used to produce iron castings from molten iron using green sand molds and set cores.
- EUSPOBREAKANDSORT - Breaking and sorting line.
- EUSPOSHAKEOUT - Shakeout and molding system and Spomatic mold line.
- EUALINE - Iron pouring and cooling line used to produce iron castings from molten iron using air set molds.
- EUALINEMOLD - A-Line core and mold making processes.
- EUFINISHING - Metal finishing operations for removing flashing, oxides, and residual sand from castings using shotblast and grinding machines.
- EUCOLDCLEANER - Three immersion cold cleaners with covers and drains used to clean metal parts.

## 2.0 CAM Requirement Applicability

Per 40 CFR 64.2(a), the CAM requirement applies to each pollutant-specific emission unit (PSEU) at a major source that is required to obtain a Part 70 permit if the unit satisfies all of the following criteria:

1. The unit is subject to an emissions limitation or standard for the applicable regulated air pollutant.
2. The unit uses a control device to achieve compliance with any such emission limitation or standard.
3. The unit has "potential pre-control device emissions" of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.
4. The unit is not exempted by the rule, or has emission limitations or standards not exempted by the rule.

CCI is a major source and is required to obtain a Part 70 permit. Permit Number 199700043, issued by the Michigan Department of Environmental Quality, identifies emission units based on process groupings. For example, Unit/Group ID EUMELTING consists of several individual emission units that are grouped together based on being part of the melting process. In many cases, there are several process units in an individual grouping that are controlled with one control device. In these cases, pre-control potential emissions are based on the entire collection of process units controlled by a common control device. This approach is consistent with the emission limits specified in Permit Number 199700043. The emission units subject to the CAM requirements are summarized in Table 1.

Potential pre-control device emissions from the EUCOREMOLDMAKING and EUALINEMOLD emission units can be broken down to the individual core or mold machines within each grouping. For these emission units, scrubbers are used to control the volatile organic compound (VOC) emissions of the catalyst used by the core and mold machines. Each core or mold machine uses less than
100 tons per year of the catalyst. As this is less than the quantity required for this pollutant to be classified as a major source, under the third requirement listed above, CAM is not applicable to these emission units.

Similarly, PM emissions from the desulfurization ladle can be calculated separate from the remaining EUMELTING PM emissions. Based on maximum charge of metal to the cupola of 180,000 tons per year, and the AP-42 emission factor of 1.09 pounds of PM emissions at the desulfurization ladle per ton of metal charged, the potential pre-control device emissions from the desulfurization ladle are 98.10 tons per year. As this is less than the quantity required for this pollutant to be classified as a major source, under the third requirement listed above, CAM is not applicable to this emission unit.

EUSPOPOURANDCOOL and EUCOLDCLEANER do not use a control device to meet an emission limitation or standard and, therefore, are not subject to CAM requirements under the first and second requirements listed above.

The remaining emission units identified in the operating permit were all determined to have maximum potential pre-control device emissions of at least one pollutant greater than the major source threshold. These emissions were conservatively determined by dividing the maximum post-controlled emission limit for each pollutant by the quantity of one minus the efficiency of the specific device used to control the pollutant emission. As an example, an afterburner is used to control carbon monoxide (CO) emissions from EUMELTING. The permit limit for CO emissions is 806.0 tons per year and the afterburner's efficiency is estimated at 98 percent destruction. The pre-controlled maximum potential emission of CO for EUMELTING are then calculated as 806.0 tons per year post-controlled emissions divided by the quantity of one minus the 98 percent efficiency expected of the oxidizer, [806.6/(1-0.98)], which yields a pre-controlled maximum potential to emit CO of 40,300 tons per year. Table 2 contains the results of this analysis.

As a result of the CAM applicability review, the emission units that require CAM Plans include the following:

- EUMELTING – CAM Plan required for CO emission limits that utilize a thermal oxidizer (afterburner) as control devices. The cupola scrubber controlling particulate emissions is exempt from CAM requirements per 40 CFR Part 64.2(b)1, as this scrubber is subject to the iron foundry MACT standards of 40 CFR Part 63, Subpart EEEEE.
- EUSPOGREENSAND – CAM Plan required for PM emission limit that utilizes a wet scrubber and baghouse as control devices.
- EUSPOBREAKANDSORT – CAM Plan required for PM emission limit that utilizes a baghouse as a control device.
- EUSPOSHAKEOUT – CAM Plan required for PM emission limit that utilizes an impingement wet scrubber as a control device.
- EUALINE – CAM Plan required for VOC and CO emission limits that utilizes a regenerative thermal oxidizer as a control device.
- EUFINISHING – CAM Plan required for PM emission limit that utilize a baghouse as a control device.

A summary of the CAM applicability is presented in Table 1.

# 3.0 CAM Plans by Type of Emission Control Device

## 3.1 Thermal Oxidizer (Afterburner) for CO Control

EUMELTING utilizes an oxidizer to achieve the control of CO missions required under R 336.1201(3). Oxidizer temperature will be used as the compliance indicator. The details of the CAM Plan for this PSEU are shown in Table 3.

## 3.2 Baghouse for PM Control

EUPOGREENSAND, EUPOBREAKANDSORT, and EUINISHING processes utilize baghouses to achieve the control of particulate matter under R 336.1331. Baghouse differential pressure will be used as the compliance indicators. The details of the CAM Plan for these PSEUs are shown in Table 4.

## 3.3 Wet Scrubber for PM Control

EUSPOGREENSAND and EUSPOSHAKEOUT utilize an impingement wet scrubber to achieve the control of particulate matter under R 336.1331. Liquid flow rate will be used as the compliance indicator. The details of the CAM Plan for this PSEU are shown in Table 5.

## 3.4 Regenerative Thermal Oxidizer for VOC and CO Control

EUALINE utilizes a regenerative thermal oxidizer (RTO) to achieve the control of volatile organic compounds and carbon monoxide under R 336.1702(c), R 336.1201(3) and 40 CFR 336.1201(3). RTO temperature will be used as the compliance indicator. The details of the CAM Plan for this PSEU are shown in Table 6.

# Tables

## Table 1
## CAM Applicability Summary

| Emission Point | Emission Source Description | Control Device | Subject to Emission Limit or Standard? | Maximum Potential Emission Uncontrolled (Ton/Year) | Potential Emissions Greater Than Major Source Threshold(1)? | CAM Applicable? |
|---|---|---|---|---|---|---|
| EUMELTING | Metal melting system consisting of cupola, three electric holding furnaces, a desulfurization ladle, four tundish ladles, and the cupola charging system. | Oxidizer<br>Baghouse<br>Venturi Scrubber | Yes<br>Yes<br>Yes | 40,300 (CO)<br>98.10 (PM)<br>774 (PM) | Yes<br>No<br>Yes | YES<br>NO<br>NO[2] |
| EUCOREMOLDMAKING | Catalyzed core and mold making. The process uses sand, binders, and catalysts to produce cores and molds for use in the foundry in the production of iron castings. | Packed Tower Scrubber | Yes | Each Machine<br>< 100 tpy VOC (catalyst) | No | NO |
| EUSPOPOURANDCOOL | Iron pouring. | None | | | | NO |
| EUSPOGREENSAND | Sand separation. | Wet Scrubber<br>Baghouse | Yes<br>Yes | 3,200 (PM) | Yes | YES |
| EUSPOBREAKSORT | Breaking and sorting line. | Baghouse | Yes | 2,400 (PM) | Yes | YES |
| EUSPOSHAKEOUT | Shakeout and molding system and Spomatic mold line. | Impingement Wet Scrubber | Yes | 480 (PM) | Yes | YES |
| EUALINE | Iron pouring and cooling line used to produce iron castings from molten iron using air set molds. | Oxidizer | Yes | 1.335 (VOC)<br>1,455 (CO) | Yes | YES<br>YES |
| EUALINEMOLD | A-Line core and mold making processes. | Packed Tower Scrubbers (2) | Yes | Each Machine<br>< 100 tpy VOC (catalyst) | No | NO |
| EUFINISHING | Metal finishing operations for removing flashing, oxides, and residual sand from castings using shotblast and grinding machines. Also includes annealing ovens for heat treating castings. Includes A-Line finishing. | Baghouses (2) | Yes | 2,980 (PM) | Yes | YES |
| EUCOLDCLEANER | Three immersion cold cleaners with covers and drains used to clean metal parts for maintenance purposes. The air/vapor interface of each cleaner is less than 10 square feet. Only non-halogenated solvent is used. | Degreaser/Cold Cleaner | No | | | NO |

Notes:
1. Major Source Threshold: 100 tons per year for criteria pollutants.
2. Exempt per 40 CFR 64.2(b)1, as this scrubber is subject to the iron foundry MACT standards of 40 CFR Part 63, Subpart EEEEE.

**Table 2**
**Maximum Potential Emissions Summary**

| Emission Point | Emission Source Description | Control Device | Control Efficiency(2) | Permit Emission Limits (TPY) | Maximum Potential Emission Uncontrolled (Ton/Year) |
|---|---|---|---|---|---|
| EUMELTING | Metal melting system consisting of cupola, three electric holding furnaces, a desulfurization ladle, four tundish ladles, and the cupola charging system. | Oxidizer (CO)<br><br>Venturi Scrubber (PM) | 98%<br><br>95% | 806.0<br><br>38.7 | 40,300<br><br>774 |
| EUCOREMOLDMAKING | Catalyzed core and mold making. The process uses sand, binders, and catalysts to produce cores and molds for use in the foundry in the production of iron castings. | Wet Scrubber (VOC)(1) | 95% | 1.1 | <100 (1) |
| EUSPOGREENSAND | Sand separation. | Wet Scrubber (PM)<br>Baghouse (PM) | 95%<br>99% | 32.0 | 3,200 |
| EUSPOBREAKANDSORT | Breaking and sorting line. | Baghouse (PM) | 99% | 24.0 | 2,400 |
| EUSPOSHAKEOUT | Shakeout and molding system and Spomatic mold line. | Wet Scrubber (PM) | 95% | 24.0 | 480 |
| EUALINE | Iron pouring and cooling line used to produce iron castings from molten iron using air set molds. | Oxidizer (VOC)<br>(CO) | 98%<br>98% | 26.7<br>29.1 | 1,335<br>1,455 |
| EUALINEMOLD | A-Line core and mold making processes. | Wet Scrubbers (VOC)(1) | 95% | 35.3 | <100 (1) |
| EUFINISHING | Metal finishing operations for removing flashing, oxides, and residual sand from castings using shotblast and grinding machines. Also includes annealing ovens for heat treating castings. Includes A-Line finishing. | Three Baghouses (PM) | 99% | 29.8 | 2,980 |

Notes:
1. Scrubbers are for control of catalyst only. Each machine uses less than 100 tons per year of catalyst.
2. Control Efficiencies are typical design expectations and have been used only to demonstrate inclusion for CAM requirements.

**Table 3**
**CAM Plan for PSEU's Utilizing a Thermal Oxidizer (Afterburner) as the Control Device for CO**

| | | | |
|---|---|---|---|
| **I** | **Background** | | |
| | A. | Emissions Unit | |
| | | Description | Metal melting system |
| | | Identification | EUMELTING |
| | B. | Applicable Regulation, Emission Limit, and Monitoring Requirements | |
| | | Regulation Nos. | R 336.1201(3), R 336.1213(3), R 336.2004, R 336.1910, R 336.1224(1) |
| | | Emissions Limits | |
| | | Carbon Monoxide | CO – 375.0 lbs/hour, 67.0 tons/month, 806.0 tons/year (12-month rolling time period) |
| | | Standard | Permittee shall not operate EU-MELTING unless a minimum temperature of 1,350 degrees Fahrenheit and a minimum retention time of 0.5 second in the afterburner are maintained. |
| | | Monitoring Requirements | Monitor and record the temperature of the cupola off-gas on a continuous basis in a manner and with instrumentation acceptable to the Air Quality Division. |
| | C. | Control Technology | |
| | | Recuperative Thermal Oxidizer (Afterburner) | |
| **II** | **Monitoring Approach** | | |
| | **The key elements of the monitoring approach are presented below:** | | |
| | A. | Indicator | Afterburner temperature as measured in the cupola off-gas will be used as the indicator of afterburner operation. |
| | B. | Measurement Approach | Temperature will be monitored and recorded continuously using a temperature measurement device. |
| | C. | Indicator Range | Temperature will be maintained greater than or equal to 1,350 degrees Fahrenheit. |
| | D. | QIP Threshold | The QIP threshold for the afterburner is five temperature excursions in a six month reporting period. |

| | | | |
|---|---|---|---|
| | E. | Performance Criteria | |
| | | Data Representativeness | Measurements are being made directly in the stack or combustion chamber. |
| | | Verification of Operational Status | Periodic review of the afterburner temperature reading by an operator and automatic alarming for low temperature. |
| | | QA/QC Practices and Criteria | The temperature measurement device will be maintained based on the plant's standard procedures which have been developed in part from the manufacturer's recommendations. |
| | | Monitoring Frequency and Data Collection Procedure | Afterburner temperature will be monitored and recorded continuously using a temperature measurement device. |
| **III** | **Justification** | | |
| | A. | Background | |
| | | CCI operates a ductile iron foundry in Cadillac, Michigan. Part of the foundry process is the metal melting system consisting of the cupola, three electric holding furnaces, a desulfurization ladle, four tundish ladles, and the cupola charging system. CCI utilizes an afterburner to control the emission of carbon monoxide from this system. | |
| | B. | Rationale for Selection of Performance Indicator | |
| | | Afterburner temperature is a direct measure at the control device of the variable most closely associated with effectiveness of control of carbon monoxide emissions. Therefore, temperature is an indicator of performance of the afterburner. | |
| | C. | Rationale for Selection of Performance Indicator Level | |
| | | The performance indicator level of a minimum temperature of 1,350 degrees Fahrenheit is taken directly from the applicable regulation and represents the temperature measured at the control device that is deemed to effectively control carbon monoxide emissions. If the temperature falls below this value, corrective action will be initiated to return the afterburner performance to a normal condition. | |

**Table 4**
**CAM Plan for PSEU's Utilizing a Baghouse as the Control Device for PM**

| | | | |
|---|---|---|---|
| **I** | **Background** | | |
| | A. | Emissions Units | |
| | | Descriptions | Sand separation, Breaking and sorting line, Metal finishing operations |
| | | Identifications | EUSPOGREENSAND, EUSPOBREAKANDSORT, EUFINISHING |
| | B. | Applicable Regulation, Emission Limit, and Monitoring Requirements | |
| | | Regulation Nos. | R 336.1331, R 336.1910, R 336.1213, R 336.1301(1)(c), R 336.2004, R 336.1702 |
| | | Emissions Limits | |
| | | Particulate Matter | PM (EUSPOGREENSAND)– 0.36 lbs/ton metal processed; 32.07 tons/year (12-month rolling time period).<br><br>PM (EUSPOBREAKANDSORT)– 0.27 lbs/ton metal processed; 24.0 tons/year (12-month rolling time period).<br><br>PM (EUFINISHING)– 0.03 lbs/1,000 lbs of exhaust gas; 7 lbs/hour; 2.5 tons/month calculated on dry gas basis; 29.8 tons/year (12-month rolling time period). |
| | | Monitoring Requirements | EUSPOGREENSAND, EUSPOBREAKANDSORT, EUFINISHING - Continuously monitor and record once per day the differential pressure across the baghouse during operation. |
| | C. | Control Technology | |
| | | Baghouses (fabric filters): Carter Day Baghouse (EUSPOGREENSAND), 80,000 CFM Baghouse #1 (EUSPOBREAKANDSORT), 80,000 CFM Baghouse #2 (EUSPOBREAKANDSORT), 40,000 CFM Baghouse (EUFINISHING), 12,000 CFM Baghouse (EUFINISHING), Sly Baghouse (EUFINISHING). Both the 12,000 CFM Baghouse and the Sly Baghouse are exhausted through HEPA filters and the exhaust is returned inside the facility. | |
| **II** | **Monitoring Approach** | | |

| | | | |
|---|---|---|---|
| | **The key elements of the monitoring approach are presented below:** | | |
| | A. | Indicator | Differential pressure will be used as the indicator for all of the baghouses. |
| | B. | Measurement Approach | Differential pressure across the baghouses will be continuously monitored. |
| | C. | Indicator Range | The differential pressure will be maintained between the following ranges:<br>Carter Day Baghouse (EUSPOGREENSAND 1.5 to 5 inches water<br>80,000 CFM Baghouse #1 (EUSPOBREAKANDSORT) 1 to 10 inches water<br>80,000 CFM Baghouse #2 (EUSPOBREAKANDSORT) 1 to 9 inches water<br>40,000 CFM Baghouse (EUFINISHING) 2 to 6 inches water<br>12,000 CFM Baghouse (EUFINISHING) 1 to 8 inches water<br>Sly Baghouse (EUFINISHING) 2 to 6 inches water |
| | D. | QIP Threshold | For each baghouse, the QIP threshold is five excursions in a six month reporting period. |
| | E. | Performance Criteria | |
| | | Data Representativeness | Measurements are being made directly at the emission points. |
| | | Verification of Operational Status | Pressure drop will be monitored continuously and recorded once per day during operation to verify operational status. |
| | | QA/QC Practices and Criteria | The pressure instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations. |
| | | Monitoring Frequency and Data Collection Procedure | Pressure drop will be monitored continuously and recorded on a daily basis, with the results stored electronically. |
| **III** | **Justification** | | |

| | | |
|---|---|---|
| | A. | Background |
| | | CCI operates a ductile iron foundry in Cadillac, Michigan. Sand separation, breaking and sorting line, and metal finishing operations are parts of the foundry process. CCI utilizes baghouses to control the emission of particulate matter from these operations. |
| | B. | Rationale for Selection of Performance Indicator |
| | | In general, baghouses are designed to operate at a relatively constant pressure drop. Monitoring pressure drop provides a means of detecting a change in operation that could lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the air flow has increased. A decrease in pressure drop may indicate broken or loose bags. A pressure drop across the baghouse also serves to indicate that there is airflow through the control device. |
| | C. | Rationale for Selection of Performance Indicator Level |
| | | Particulate emissions from the baghouse exhaust vary within a normal range dependent on process variables. So long as the differential pressure remains within this normal range, the baghouse is performing as expected. If the differential pressure is out of the allowable operating range, then baghouse performance is abnormal and corrective action will be initiated to return the baghouse performance to normal. |

**Table 5**
**CAM Plan for PSEU's Utilizing a Wet Scrubber as the Control Device for PM**

| | | | |
|---|---|---|---|
| **I** | **Background** | | |
| | A. | Emissions Units | |
| | | Descriptions | Sand separation, shakeout and mold system and Spomatic mold line |
| | | Identifications | EUSPOGREENSAND, EUSPOSHAKEOUT |
| | B. | Applicable Regulation, Emission Limit, and Monitoring Requirements | |
| | | Regulation No. | R 336.1213, R 336.1910, R 336.1331, R 336.2004, R 336.1702 |
| | | Emissions Limits | |
| | | Particulate Matter | EUSPOGREENSAND: PM - 0.36 lbs/ton metal processed, 32.0 tons/year (12-month rolling time period)<br>EUSPOSHAKEOUT: PM – 0.27 lbs/ton metal processed, 24.0 tons/year (12-month rolling time period) |
| | | Monitoring Requirements | Monitor and record the liquid flow rate through the scrubber system on a continuous basis in a manner and with instrumentation acceptable to the Air Quality Division. |
| | C. | Control Technology | |
| | | Wet Scrubber: North Multiwash Scrubber, South Multiwash Scrubber | |
| **II** | **Monitoring Approach** | | |
| | **The key elements of the monitoring approach are presented below:** | | |
| | A. | Indicator | Liquid flow rate through the scrubber will be used as the indicator. |
| | B. | Measurement Approach | Liquid flow rate through the scrubber will be monitored using instrumentation typical for the parameter. |
| | C. | Indicator Range | The liquid flow rate to the scrubber must be maintained at a minimum of 150 gpm. |
| | D. | QIP Threshold | The QIP threshold for the indicator is five excursions in a six month reporting period. |
| | E. | Performance Criteria | |

| | | | |
|---|---|---|---|
| | | Data Representativeness | Liquid flow is measured directly at the control device. |
| | | Verification of Operational Status | Liquid flow rate will be monitored and recorded on a continuous basis to verify operational status. |
| | | QA/QC Practices and Criteria | The flow instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations. |
| | | Monitoring Frequency and Data Collection Procedure | Liquid flow rate will be monitored and recorded on a continuous basis and results stored electronically. |
| **III** | **Justification** | | |
| | A. | Background | |
| | | CCI operates a ductile iron foundry in Cadillac, Michigan. Part of the foundry process is sand separation and part of the foundry process is the shakeout and mold system and Spomatic mold line. CCI utilizes two wet scrubbers to control the emission of particulate matter from these systems. | |
| | B. | Rationale for Selection of Performance Indicator | |
| | | Liquid flow rate is selected as the performance indicator because it is the parameter that best determines effectiveness of the control device. | |
| | C. | Rationale for Selection of Performance Indicator Level | |
| | | Liquid flow rate indicator levels have been selected based on the level established in the applicable standards, which are deemed to achieve effective control of particulate matter emissions. | |

**Table 6**
**CAM Plan for PSEU's Utilizing a Venturi Scrubber as the Control Device for PM**

| | | | |
|---|---|---|---|
| **I** | **Background** | | |
| | A. | Emissions Units | |
| | | Descriptions | Metal melting system |
| | | Identifications | EUMELTING |
| | B. | Applicable Regulation, Emission Limit, and Monitoring Requirements | |
| | | Regulation No. | R 336.1331(1)(c), R 336.1910 |
| | | Emissions Limits | |
| | | Particulate Matter | PM – 18.0 pounds per hour, 3.17 tons/month |
| | | Monitoring Requirements | Monitor and record the liquid flow rate through the venturi scrubber system on a continuous basis in a manner and with instrumentation acceptable to the Air Quality Division. |
| | C. | Control Technology | |
| | | Wet Scrubber: Venturi Scrubber | |
| **II** | **Monitoring Approach** | | |
| | **The key elements of the monitoring approach are presented below:** | | |
| | A. | Indicator | Liquid flow rate through the scrubber will be used as the indicator. |
| | B. | Measurement Approach | Liquid flow rate through the scrubber will be monitored using instrumentation typical for the parameter. |
| | C. | Indicator Range | The liquid flow rate to the scrubber must be maintained at a minimum of 115 gpm. |
| | D. | QIP Threshold | The QIP threshold for the indicator is five excursions in a six month reporting period. |
| | E. | Performance Criteria | |

| | | | |
|---|---|---|---|
| | | Data Representativeness | Liquid flow rate is measured directly at the control device. |
| | | Verification of Operational Status | Liquid flow rate will be monitored and recorded on a continuous basis to verify operational status. |
| | | QA/QC Practices and Criteria | The flow instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations. |
| | | Monitoring Frequency and Data Collection Procedure | Liquid flow rate will be monitored and recorded on a continuous basis and results stored electronically. |
| **III** | **Justification** | | |
| | A. | Background | |
| | | CCI operates a ductile iron foundry in Cadillac, Michigan. Part of the foundry process is the metal melting system consisting of the cupola, three electric holding furnaces, a desulfurization ladle, four tundish ladles, and the cupola charging system. CCI utilizes venturi scrubber to control PM emissions from the melt system. | |
| | B. | Rationale for Selection of Performance Indicator | |
| | | Liquid flow rate is a direct measure at the control device of the variable most closely associated with effectiveness of control of particulate emissions. Therefore, liquid flow rate is an indicator of performance of the venturi scrubber. | |
| | C. | Rationale for Selection of Performance Indicator Level | |
| | | Liquid flow rate indicator levels have been selected based on the level established in the applicable standards, which are deemed to achieve effective control of particulate matter emissions. | |

**Table 7**
**CAM Plan for PSEU's Utilizing a Regenerative Thermal Oxidizer as the Control Device for VOC and CO**

| | | | |
|---|---|---|---|
| **I** | **Background** | | |
| | A. | Emissions Units | |
| | | Descriptions | Iron pouring and cooling line |
| | | Identifications | EUALINE |
| | B. | Applicable Regulation, Emission Limit, and Monitoring Requirements | |
| | | Regulation No. | R 336.1213(3), R 336.1910, R 336.1201(3), R 336.1331, R 336.1702, 40 CFR 52.21, R 336.2004 |
| | | Emissions Limits | |
| | | Volatile Organic Compounds<br>Carbon Monoxide | VOC – 26.7 tons/year (12-month rolling time period)<br><br>CO – 29.1 tons/year (12-month rolling time period) |
| | | Monitoring Requirements | Monitor and record the temperature in the regenerative thermal oxidizer on a continuous basis. |
| | C. | Control Technology | |
| | | Regenerative Thermal Oxidizer | |
| **II** | **Monitoring Approach** | | |
| | **The key elements of the monitoring approach are presented below:** | | |
| | A. | Indicator | RTO temperature will be used as the indicator of RTO operation. |
| | B. | Measurement Approach | Temperature will be monitored and recorded continuously using a temperature measurement device. |
| | C. | Indicator Range | Temperature will be maintained greater than or equal to 1,500 degrees Fahrenheit during operation of the process or maintain the minimum temperature established during the most recent emissions testing. |

| | | | |
|---|---|---|---|
| | D. | QIP Threshold | The QIP threshold for the indicator is five excursions in a six month reporting period. |
| | E. | Performance Criteria | |
| | | Data Representativeness | Measurements are being made directly in the stack or combustion chamber. |
| | | Verification of Operational Status | Periodic review of the RTO temperature reading by an operator and automatic alarming for low temperature. |
| | | QA/QC Practices and Criteria | The temperature measurement device will be maintained based on the plant's standard procedures which have been developed in part from the manufacturer's recommendations. |
| | | Monitoring Frequency and Data Collection Procedure | Afterburner temperature will be monitored and recorded continuously using a temperature measurement device. |
| **III** | **Justification** | | |
| | A. | Background | |
| | | CCI operates a ductile iron foundry in Cadillac, Michigan. Part of the foundry process is the iron pouring and cooling line. CCI utilizes a regenerative thermal oxidizer to control the emission of VOCs and CO from this system. | |
| | B. | Rationale for Selection of Performance Indicator | |
| | | RTO temperature is a direct measure at the control device of the variable most closely associated with effectiveness of control of VOCs and CO emissions. Therefore, temperature is an indicator of performance of the RTO. | |
| | C. | Rationale for Selection of Performance Indicator Level | |
| | | The performance indicator level of a minimum temperature of 1,500 degrees Fahrenheit (or the minimum temperature established during the most recent emissions testing) is taken directly from the applicable regulation and represents the temperature at the control device that is deemed to effectively control VOCs and CO emissions. If temperature falls below this value, corrective action will be initiated to return the afterburner performance to a normal condition. | |

# Appendix A
# Afterburner Temperature Monitoring Data

# Appendix B
# Baghouse Differential Pressure

# Appendix C
# Wet Scrubber Liquid Flow Rate Data

# Appendix D
# Venturi Scrubber Liquid Flow Rate Data

# Appendix E
# RTO Temperature Monitoring Data