ArcelorMittal

March 25, 2025

Ms. Jennifer Youngpeter
Alabama Department of Environmental Management
Air Division
1400 Coliseum Blvd.
Montgomery, AL 36110

RE: AM Calvert, LLC - Carbon Steel Mill
Prevention of Significant Deterioration (PSD) Permit Application Addendum
NOES Facility

Dear Ms. Youngpeter:

AM Calvert, L.L.C. (AM) is submitting this addendum in support of the previously submitted, on February 7, 2025, Prevention of Significant Deterioration (PSD) permit application to request authorization for construction and operation of the NOES facility on the shared property of AM/NS Calvert L.L.C. which will allow AM to produce steel coils. This addendum addresses comments provided by ADEM after the initial submittal of the application and the additional information submitted on February 27,2025.

If you have any questions regarding this submittal or need further information, please do not hesitate to contact Jacqueline Gorski at (251) 225-0475.

Sincerely,

Keith Howell, COO, AM Calvert, L.L.C.

cc: US EPA Region 4

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Prevention of Significant Deterioration (PSD) Permit Application

Arcelor Mittal Calvert, LLC NOES Project

PREPARED FOR
Arcelor Mittal

DATE
25 March 2025

REFERENCE
0721801

SIGNATURE PAGE

Prevention of Significant Deterioration (PSD) Permit Application

Arcelor Mittal Calvert, LLC NOES Project

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1. INTRODUCTION

AM/NS Calvert, L.L.C. (AM/NS), a joint venture between Arcelor Mittal and Nippon Steel, owns and operates a carbon steel mill located in Calvert, Alabama. The facility was previously owned and operated by ThyssenKrupp Steel USA, L.L.C. (TKS). TKS submitted Prevention of Significant Deterioration (PSD) permit applications for the carbon steel mill and obtained construction authorizations via PSD permits issued by the Alabama Department of Environmental Management (ADEM). Initial operation of certain sources at the facility commenced in June 2010 under Temporary Authorizations to Operate (TAOs) issued by ADEM. As per Alabama Administrative Code (AAC) 335-3-16-.04(1), an initial Title V operating permit application was submitted within 12 months after the commencement of operations. AM/NS acquired the facility in February of 2014, and filed the necessary transfer of ownership notifications. The most recent Title V permit was issued by ADEM on October 22, 2021 (Permit Number 503-0095).

Arcelor Mittal Calvert, L.L.C. (AMC) is adding steel processing operations on the shared AM/NS property and is submitting this permit application to request authorization for the following additions:

- Construction of a new annealing and pickling line;
- Construction of two (2) new annealing and coating lines;
- Construction of two (2) new cold rolling mills; and
- Construction of any ancillary sources for these process lines.

The air permit application is organized as follows:

- Section 1.1 – Facility Description;
- Section 1.2 – Description of Proposed Changes;
- Section 2 – Description of Emission Sources and Calculation Methodology;
- Section 3 – PSD applicability analysis;
- Section 4 – Federal and State Regulatory Review;
- Appendix A – Process Flow Diagrams;
- Appendix B – Emission calculations;
- Appendix C – ADEM Permit Application Forms;
- Appendix D – Best Achievable Control Technology (BACT) Analysis;
- Appendix E – Supporting Documentation for BACT Analysis;
- Appendix F – Compliance Assurance Monitoring (CAM) Plan; and
- Appendix G – Air Dispersion Modeling Report.

1.1 FACILITY DESCRIPTION

The facility manufactures and processes carbon steel products for high-value applications by manufacturers in North America and throughout the North American Free Trade Agreement (NAFTA) region. The facility can produce various grades and/or types of steel strips in various forms (i.e., coils, slits, sheets, blanks, and so on) with various coatings, finishes, and properties for general industrial use. Much of the product is consumed by the automotive industry, appliance industry, tube manufacturers, steel fabricators, and steel service centers, among others.

Raw materials for the production of the non-grain oriented electrical steels (NOES) will be provided by the AM/NS facility. Comprised of various alloys, the Steel Making Facility will melt the raw materials in the Electric Arc Furnace, and then cast steel slabs. The slabs will then await rolling time in the AM/NS Hot Strip Mill (HSM). It is the HSM where the steel slabs are heated and rolled to form the flat strip, which is then coiled for shipment to the NOES mill, within the Calvert site.

1.2 PROCESS DESCRIPTION

A detailed description of the sources in this permit application is provided below.

1.2.1 ANNEALING AND PICKLING LINE

Hot rolled coil (HRC) is first processed at the annealing and picking line (APL) to anneal the strip (controlled heating cycle) and then remove the surface oxide (scale) layer, which forms as a regular aspect of steel production. The APL is a continuous process that ensures consistency of quality, process yield and its readiness for the cold rolling operation.

In this mill, hot-rolled coils are welded together into one continuous strip. The strip passes through entry trimmer and accumulator before entering the annealing furnace, a shot blaster and then pickling baths to clean its surface. After the APL process the strip proceeds to a reversible cold rolling mill that rolls the strip to its specified thickness.

In the entry section of APL, the hot-rolled coil is prepared for welding after being threaded through a flattener/processor. To start the process, two coils are positioned at the welding machine of the continuous pickling line. The tail end of each coil is positioned and welded to the lead end of subsequent coils to form a continuous strip. The strip passes through entry trimmer to adjust its width and remove edge defects. Cut pieces drop into a scrap box for recycling. The strip comes through the entry accumulator before entering the annealing furnace to ensure stable-speed processing.

At the beginning of the process, the strip is annealing inside a continuous furnace with a controlled atmosphere containing nitrogen, hydrogen, and oxygen and at a given temperature. The primary purpose of the batch annealing furnace is to heat treat the steel strip coils to produce a more homogenous coil metallurgical structure. This is accomplished with a series of heating and cooling sections.

The preheating section is used to recover heat from the products of combustion from the direct fired section by forcing the products of combustion in counterflow to the strip travel before they are exhausted. The non-oxidizing furnace efficiency is increased by allowing post-combustion in the preheating section. The post-combustion is performed by injection of hot air in the preheating section, where there is no risk of strip oxidation. The air will burn the CO and H2 present in the flue gases due to incomplete combustion in the direct fired section and high temperature in the pre-heating section.

To heat the strip rapidly by means of direct flame radiation, fuel and air are burned at less than full stoichiometric combustion ratio so that hydrogen and carbon monoxide are present in the combustion products. The burners are fired directly into the chamber that is maintained at a high temperature level of approximately 1150-1200°C, thus promoting high rates of heat transfer to the strip. At the same time, reducing atmosphere, enriched by the hydrogen issuing from the soaking furnace, maintains the strip surface free from oxides and removes harmful vapor resulting from the breakdown of rolling oils. The burner design is nozzle mix combustion with hot air at high velocity.

To control emissions, standard NOx burners, a Denox system and waste heat recovery are utilized on the furnace. The exhaust from the annealing furnace is used for the strip preheating as an energy efficiency measure. Emissions from the furnace are emitted to the atmosphere via one stack. The annealed strip then passes through a cooling section and are cooled with a water rinse and emissions from this cooling section are vented horizontally out of the building.

Once annealed, cooled down and dried out, the scale at the surface of the strip is mechanically broken off with a shot blaster. A scale collection system that removes solids and dust generated during the threading of the processor and mechanical cleaning operations vents the air through a baghouse to the atmosphere. The continuous strip is then chemically cleaned in the pickling section.

Hydrochloric acid (HCl) chemically removes the ferric oxide layer from the surface of the strip. The pickling tank is divided into separate pickling chambers. Each pickling chamber has a dedicated acid supply tank. The pickling and acid supply tanks are fitted with covers to reduce evaporative losses and air emissions. Spent acid is pumped to the HCl acid regeneration plant (ARP). The strip then enters the rinsing section, where demineralized water is used to rinse the strip. The steel strip then enters a drying section where hot air, which is indirectly heated through steam coils, removes the remaining moisture from the strip. Acid fumes generated during pickling are captured and treated in a scrubber and vented.

After the strip has been cleaned in the mechanical and chemical process, the strip passes through inspection system to verify the surface quality. The strip is then coiled and stored for the rolling process.

1.2.1.1 ACID REGENERATION PROCESS

The ARP processes ferrous chloride solution (FCS) produced by the pickling lines to regenerate HCl and produce solid iron oxide (Fe_2O_3). FCS from the pickling lines is transferred via closed pipe and stored in a tank farm (Tank Farm #1). The FCS is first concentrated by heat transfer in a venturi scrubber using hot HCl gasses from a spray roaster. The concentrated FCS, referred to as concentrated pickle liquor (CPL), is then fed to the spray roaster as a fine spray. The spray roaster utilizes natural gas burners to generate heat for dehydration and chemical processing of the CPL. Solid iron oxide generated at the bottom of the spray roaster is stored in iron oxide bins and shipped offsite. Emissions from the iron oxide bins are controlled by bag filters. The free HCl in the CPL vaporizes in the spray roaster and leaves the spray roaster mixed with off gases. The HCl in the off gases is dissolved into a solution of 18 percent HCl by passing through a packed column absorber by contacting with sprayer water. Emissions from the spray roaster ARP process units are routed to four control devices in series before exiting through a single stack: a packed column wet scrubber, a dust venturi scrubber and vapor separator, a second packed wet scrubber, and a mist eliminator. The second packed wet column scrubber could be designed to utilize a chemical treatment if necessary to meet emissions limits.

The regenerated 18 percent HCl solution is then stored in Tank Farm #1, before being transferred via closed pipe to the pickling lines, the truck loading bay, or the railcar loading bay (if installed). From the loading bays, HCl solution is shipped offsite. Emissions from the truck loading bay and the potential railcar loading bay are routed to a wet scrubber that also controls the emissions from Tank Farm #1. FCS may potentially be shipped in or out, and HCl has the potential to be shipped offsite in the future.

A step-by-step description of the entire ARP process is outlined below.

1.2.1.2 PRE-HEATING WITH A WATER SPRAY

The spray roaster will first be dry heated until the roaster top temperature reaches approximately 400°C. Next, the roaster will be further heated by spraying water until the roaster external skin temperature reaches approximately 200°C. During this process, the absorber and absorber pump are kept in full recycle mode, recycling water.

1.2.1.3 ACID OPERATION

After pre-heating the roaster, the ARP will be switched to the “acid operation” mode. The venturi separator is switched to “acid mode” which signals for FCS to be pumped from Tank Farm #1 to the vapor separator. The FCS contains ferrous chloride ($FeCl_2$), free HCl, and water. A venturi recycle pump will continue to draw liquid from the vapor separator and feed it to a venturi scrubber in order to quench the incoming hot gas from the spray roaster and scrub the particulate matter. During this mixing of hot gas and liquid from the vapor separator, significant amounts of water vapor are generated and the FCS liquid is concentrated. The liquid/vapor mixture returns to the vapor separator through a tangential entry and the hot gases from the spray roaster containing combustion products and HCl vapors proceed to a packed column absorber. The concentrated CPL is then routed to the spray roaster as discussed below.

1.2.1.4 ACID SPRAY TO THE SPRAY ROASTER

The spray roaster is switched to “acid spray mode” and CPL from the venturi recycle pump is supplied to the spray roaster. The acid is sprayed into the top of the roaster in the form of a fine mist-like spray. In the spray roaster, the CPL comes into contact with hot combustion products that react with the oxygen (O_2) and water (H_2O) to form iron oxide. The following reactions occur:

$$4FeCl_2 + 4H_2O + O_2 \rightarrow 2Fe_2O_3 + 8HCl ---- Reaction\ 1$$

$$2FeCl_3 + 3H_2O \qquad \rightarrow 2Fe_2O_3 + 6HCl ---- Reaction\ 2$$

The ferric oxide produced falls to the bottom of the roaster and reaches iron oxide bins that are held on a pneumatic conveyor system. The off gases containing HCl and other combustion products that are generated from the above reactions go out of the roaster through an off gas duct to the venturi scrubber for further heat transfer as described above. In the venturi scrubber, some of the iron oxide which gets carried over along with off gases reacts with free HCl and produces $FeCl_3$ as per the reverse of reaction.

1.2.1.5 ABSORBER

After exiting the venturi scrubber/vapor separator, the HCl containing gas enters the bottom of a packed column absorber. Water from packed column scrubber #1 is sprayed into the top of the absorber and HCl containing gas flows up through the absorber and comes into contact with the spray water. Concentration of HCl in water (target concentration 18%) is controlled by controlling the spray water flow rate to the absorber. HCl solution is collected at the basin of the absorber and continuously pumped back to Tank Farm #1.

1.2.1.6 SCRUBBING SYSTEM

The exhaust gas from the packed column absorber enters a packed column scrubber #1 where remaining traces of HCl from the exhaust gas are removed. The scrubber recirculation pump supplies water, with captured HCl, to the absorber. Industrial water is used as a major source of make-up water for the absorber and packed column scrubber #1 and is fed to packed column scrubber #2.

Using an exhaust fan, the exhaust gas from scrubber #1 is routed to a dust venturi scrubber and vapor separator in series. This is a relatively higher pressure drop venturi type scrubber where the recirculation water passes through the venturi and then through a vapor-liquid separator. Industrial water is used as make-up water in this scrubber. The exhaust gas from the dust venturi scrubber/vapor separator enters another packed column scrubber #2 and a mist eliminator in series. Discharge vapor from the mist eliminator is let out to the atmosphere through a stack. The packed column scrubber #2 could be designed to use a chemical treatment in lieu of water to improve control efficiency, if required to meet emissions limits. This chemical treatment would result in no emissions increases as compared to using water.

1.2.1.7 TREATMENT OF IRON OXIDE

After being formed in the spray roaster, iron oxide exits the roaster through a lump breaker and then through a variable frequency driven rotary air-lock valve. The lump breaker breaks any demineralized agglomerate of iron oxide that may be formed. The rotary valve speed can be varied to control the flow of iron oxide to the pneumatic conveying system. In the pneumatic conveyor, the iron oxide is conveyed to the top of one of two storage bins. The conveying air is filtered by bag filters mounted on the bin-top before being discharged to the atmosphere. The oxide blower which is also mounted on the bin platform creates suction in the conveying line for iron oxide movement. Each of the two iron oxide storage bins is provided with a separate bag filter. Since only one bin is used at a time, there is only one common stack for both the bins.

1.2.2 COLD ROLLING MILLS

The annealed and pickled coils are then rolled at two reversing cold rolling mills (RCM), processed in parallel, to reduce the strip to the final substrate thickness for the end product. Each RCM is a single stand mill in which force is applied to a strip by rolls with hydraulic control to reduce thickness. The strip is in tension between two reels and is rolled in successive passes, alternating in the forward and reverse direction, until the final thickness is achieved. Oil-water emulsion spray equipment is used to lubricate the roll gap and cool the work roll barrel while maintaining control of the strip temperature profile. The emulsion system is a closed loop to collect, filter, and recirculate used emulsion. A strip blow-off drying system removes emulsion drops from the finished strip. Both cold rolling mills (CRM) are enclosed with fume exhaust hoods over the mills and tension reels. The exhaust oil mists and fumes are conveyed from the hoods to the mist elimination system with condenser unit before venting.

1.2.3 ANNEALING AND COATING LINES

The full-hard cold rolled coils are then processed through the two continuous annealing and coating lines (ACL), processed in parallel, to produce the end product with correct metallurgical properties. At the entry section of the lines, the coils are unwound, thread through a flattener, and conveyed to the welding unit. The lead end of a new coil is welded to the tailing end of the preceding coil to form a continuous strip that passes into the subsequent process sections. The continuous strip is then split at the exit section by removing the weld with a crop shear and winding the strip into coils.

The continuous strip passes first through a cleaning section to remove the iron fines and oils that remain on the strip after cold rolling. The strip is cleaned with an alkaline degreasing solution (NaOH and demineralized water) in a series of sprays, brushes, and electrolytic cleaning tanks. After electrolytic cleaning, the strip passes through a brush rinse section, followed by a cascade spray rinse with demineralized water, and finally a blow-off and hot air dryer. The fluids of the cleaning section are pumped through a circulation system with separate circulation equipment for each sub-section and filtration of the wastewater.

After cleaning, the strip is annealed in a fully electric furnace with a hydrogen atmosphere. The strip is progressively heated to and held at the required temperature using only electrical heating elements, and then cooled at a controlled rate. The heating, soaking, and cooling sections of the furnace are all under atmosphere control. The furnace is tightly sealed and kept under positive pressure of inert atmosphere. During operation, HNx gas is permanently injected into the furnace. The hydrogen atmosphere will be vented through five separation seals along the annealing and coating line furnace and subsequently flared. There is a seal at the beginning and end of the furnace, as well as three spaced along the process furnace. The emissions associated with the annealing furnace are only because of thermal NOx generated from flaring. There is no open flame or natural gas pilot light as part of this hydrogen purging.

A thin coating of a liquid varnish is then applied to the annealed strip and cured. The water-borne coating material are pumped from containers into circulation tanks that feed the roll coater units. The coater units are contained within a closed and climate-controlled coater room with exhaust hoods. The strip passes through the roll coaters, where the liquid varnish is applied to the surface of the strip, and then into the one of the curing ovens. The coating is dried and cured at the required temperature, and the solvents are evaporated. The coated strip is cooled with air, and then passes into the exit section with inspection and measurement of strip quality before being rewound into coils. After passing through the air cooling sections, the strips are sprayed with a cooling quench to complete the cooling prior to further slitting and rewinding.

The curing ovens are heated with direct-fired natural gas burners. The contaminated exhaust air from the curing section and the coater sections is processed through the corresponding Regenerative Thermal Oxidizer (RTO). The RTOs destroy the Volatile Organic Carbon (VOC) and Hazardous Air Pollutants (HAP) by reaction with oxygen at a controlled temperature. The RTOs are equipped with natural gas burners to maintain the required temperature.

1.2.4 SLITTING AND PACKAGING

Coils from the ACL can be further processed on a precision slitting line to provide the final product at a specific width, with the appropriate quality verification and packaging according to customer requirements.

This multipurpose line is used for slitting, rewinding, and packaging strip coil. The line divides the coil into narrower coils. Edge trimmers and entry shears prepare the lead edge before the strip enters the slitter. Cut pieces drop into a scrap box for recycling. No emissions are generated during this process. An inspection system is used to verify the quality of the strip.

1.2.5 ROLL SHOP

During rolling at the RCM, the steel rolls wear and are sent to the roll shop to be ground and restored for use again in the RCM. The rolls may be processed through a cleaning station where they will be wiped clean using water or mild detergent to remove grease and scale dust from the roll shaft and spindle. The cleaned rolls are then transported to the wet grinding process to grind and refinish the roll surface. No air emissions are generated during wet grinding.

2. EMISSION CALCULATIONS

2.1 COOLING TOWER

The particulate emissions for the contact cooling tower were estimated based on the expected circulation rate for the cooling tower, the estimated total dissolved solids (TDS), and the drift rate from the high-efficiency drift eliminators.

Particulate emissions were speciated into particulate matter 10 micrometers or less and 2.5 micrometers or less in diameter (PM_{10} and $PM_{2.5}$) based on the Joel Reisman and Gordon Frisbie Whitepaper on Calculating Realistic PM_{10} Emissions from Cooling Tower[1].

2.2 EMERGENCY DIESEL GENERATORS

The emissions from the two (2) emergency diesel generators are based on 500 hours of operation per year. Tier II and Tier III emission standards are conservatively assumed as emission factors, as the engines will be certified to meet Tier II and Tier III standards as applicable. The power ratings along with the applicable Tier II and Tier III emission rates are used to calculate emissions for NOx, CO, VOC, and PM_{10}, and $PM_{2.5}$. Emission factors for all speciated organics are from AP-42 Chapter 3, Sections 3.3 and 3.4. SO_2 emissions are based on an emission factor developed from the low sulfur content of the diesel fuel (15 ppm). GHG emissions are calculated using Global Warming Potentials and emission factors from 40 CFR 98, Table A-1, Table C-1, and Table C-2.

2.3 PICKLING LINE SCRUBBER

The particulate emissions for the pickling line scrubber were obtained from the original equipment manufacturer (OEM) technical guarantees based on the BACT. The HCl emissions are calculated in correspondence with the applicable limitation of 40 CFR 63 Subpart CCC.

2.4 BOILERS

Emissions from the two (2) boilers used to provide process steam were calculated based on the natural gas firing rates with emission factors using OEM technical guarantees for NOx and CO and from AP-42, Section 1.4 Natural Gas Combustion (July 1998) for all other pollutants.

2.5 CURING OVEN & RTO

Emissions from the two (2) natural gas fired curing ovens calculated based on the natural gas firing rates with emission factors using OEM technical guarantees for NOx, VOC, and CO and from AP-42, Section 1.4 Natural Gas Combustion (July 1998) for all other pollutants. Each curing oven has a natural gas fired regenerative thermal oxidizer (RTO) to control VOC at a 99% destruction efficiency or to levels of 20 ppmv as carbon based on the inlet concentration of VOC emissions. The additional emissions from the RTOs were calculated based on the natural gas firing rates with emission factors using OEM technical guarantees for NOx and CO and from AP-42, Section 1.4 Natural Gas Combustion (July 1998) for all other pollutants.

1 https://www.energy.ca.gov/sitingcases//palomar/documents/applicants_files/Data_Request_Response/Air%20Quality/Attachment%204-1.pdf

2.6 CURING OVEN COOLING SECTION

Emissions from the cooling section following the curing oven are based on a stack exhaust flow rate and emission factors provided by the OEM.

2.7 ANNEALING FURNACE

Emissions from the annealing furnace were calculated based on the natural gas firing rates with emission factors using OEM technical guarantees for NOx and from AP-42, Section 1.4 Natural Gas Combustion (July 1998) for all other pollutants.

2.8 ARP AND IRON OXIDE BINS

Emissions from the ARP were calculated based on the natural gas firing rates with emission factors using OEM technical guarantees for NOx, PM_{10}, and $PM_{2.5}$, applicable emission limitations from 40 CFR 63 Subpart CCC for HCl and Cl_2, and from AP-42, Section 1.4 Natural Gas Combustion (July 1998) for all other pollutants.

The iron oxide emissions, as particulate emissions, generated from the use of the ARP are calculated using the stack exhaust flow rate and the emissions factors provided by the OEM.

2.9 SHOT BLASTER AND ACL CLEANING SECTIONS

The particulate emissions from the shot blaster and the two (2) annealing and coating line cleaning sections are based on a stack exhaust flow rate and emission factors provided by the OEM.

2.10 H_2 FLARE AND PURGE

Emissions from the hydrogen flares are calculated based on the exhaust flow rates provided by the OEM and the emissions factors and heating values provided by TCEQ’s NSR guidance on flare emissions. The only emissions here are due to thermal NOx generated from combustion of hydrogen as there is no natural gas pilot light.

2.11 COLD ROLLING MILLS

The particulate emissions from the two (2) cold rolling mills are based on a stack exhaust flow rate and emission factors provided by the OEM.

2.12 TANK FARM SCRUBBER

The particulate emissions for the tank farm scrubber were obtained from the OEM technical guarantees based on the BACT. The HCl and Cl_2 emissions are calculated in correspondence with the applicable limitation of 40 CFR 63 Subpart CCC.

2.13 QUENCHING OPERATIONS

Emissions from the quenching operations are based on a stack exhaust flow rate, emission factors provided by the OEM, and a control efficiency from the mist eliminator.

TABLE 2-1 SUMMARY OF NOES PROJECT POTENTIAL TO EMIT

Pollutant	Annual Emissions Rate (tpy)
PM	44.41
PM_{10}	41.63
$PM_{2.5}$	30.76
CO	78.50
SO_2	0.59
NO_x	72.93
VOC	53.97
Lead (Pb)	0.0005
Total HAP	11.81
CO_2e	122,123.78

3. PSD APPLICABILITY ANALYSIS

3.1 PSD APPLICABILITY

AMC is located in Mobile County, which is currently designated as being in attainment of all National Ambient Air Quality Standards (NAAQS). Because the plant is located in an attainment area, Nonattainment New Source Review (NNSR) would not currently apply to this project. Therefore, the only New Source Review (NSR) mechanism considered in this analysis is PSD.

PSD applies to new major stationary sources or major modifications at existing major stationary sources located in NAAQS attainment or unclassifiable areas. AMC is an existing major stationary source in an attainment area. Per ADEM Administrative Code (AAC) 335-3-14-.04(2)(b), a major modification at an existing major stationary source is defined as follows:

"Major modification shall mean any physical change in or change in the method of operation at a major stationary source that would result in a significant net emissions increase of any regulated NSR pollutant."

A detailed applicability analysis of PSD to the changes proposed in this application is presented below.

As the NOES project involves construction of new emission sources, the project qualifies as a physical change and the proposed project emissions were compared to the PSD "Significant Emission Rate (SER)" of subject pollutants to determine if the project constitutes a major modification to an existing major source facility. The NOES project is not expected to have an effect on actual emissions from existing sources at the facility. The results of this comparison are presented in Table 3-1 below.

TABLE 3-1 PSD APPLICABILITY ANALYSIS

Pollutant	Baseline Actual Emissions (tpy)	Project Potential Emissions (tpy)	Net Emissions Increase[2] (tpy)	PSD SER (tpy)	PSD Review Triggered?
PM	0	44.41	44.41	25	YES
PM_{10}	0	41.63	41.63	15	YES
$PM_{2.5}$	0	30.76	30.76	10	YES
CO	0	78.50	78.50	100	NO
SO_2	0	0.59	0.59	40	NO
NO_x	0	72.93	72.93	40	YES
VOC	0	53.97	53.97	40	YES
Pb	0	0.0005	0.0005	0.6	NO
CO_2e	0	122,123.78	122,123.78	75,000	YES

2 The project emission increases are conservatively assumed to be equal to the net emissions increase.

As shown in Table 3-1, the net emissions increase of some of these PSD pollutants is greater than the respective PSD SERs and therefore, these pollutants are subject to PSD review. Detailed emission calculations are provided in Appendix B. For projects that trigger PSD permitting requirements, the following items are required to be addressed in the permit application:

- Determination of BACT for each pollutant which triggers PSD review;
- NAAQS and PSD Increment Air Quality analysis;
- Additional Health Impact Analysis; and
- Class I Area Impact.

The detailed BACT analysis is included in Appendix D of this application. Detailed modeling results for pollutants subject to PSD review will be provided in Appendix H.

4. REGULATORY APPLICABILITY ANALYSIS

The Calvert Mill is subject to certain state and federal air regulations. AMC has prepared the required ADEM PSD NSR permit application forms, which are included in Appendix C of this application. Item number 11 of ADEM Form 103 includes a detailed summary of all applicable numerical emission limitations and the corresponding regulatory basis for each limitation. The following sections of this report include a qualitative overview of applicable Alabama and federal air quality regulations for the affected sources covered in this Title V permit renewal application.

4.1 FEDERAL AIR QUALITY REGULATIONS

4.1.1 NEW SOURCE REVIEW APPLICABILITY

The Calvert Mill is located in Mobile County, which is designated as "attainment" or "unclassifiable" for all criteria pollutants with respect to the NAAQS. The governing NSR regulation is therefore the PSD permitting program. The Calvert Mill is a major source under the PSD regulations.

4.1.2 TITLE V APPLICABILITY

40 CFR 70 establishes the federal Title V operating program. Alabama has incorporated the provisions of this federal program in its state regulation, Rule 335-3-16, Major Source Operating Permits. The Calvert Mill is a major source under the Title V program and as discussed under the appropriate Alabama state regulation, this application is being submitted to meet the requirements of the Title V (MSOP) program.

4.1.3 NEW SOURCE PERFORMANCE STANDARDS

New Source Performance Standards (NSPS) require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. An applicability analysis of potentially applicable NSPS subparts is presented below.

4.1.3.1 40 CFR 60 SUBPART A – GENERAL PROVISIONS

Sources subject to source-specific NSPS are also subject to the general provisions of NSPS Subpart A. In general, NSPS Subpart A may require facilities subject to a source-specific NSPS to be subject to the following:

- Initial construction/reconstruction notifications;
- Initial startup notifications;
- Performance tests;
- Performance test date initial notifications;
- General monitoring requirements;
- General recordkeeping requirements; and
- Semiannual monitoring system and/or excess emissions reports.

4.1.3.2 40 CFR 60 SUBPART DB – STANDARDS OF PERFORMANCE FOR INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS

The NSPS – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60 Subpart Db (60.40b – 49b), regulates air emissions from steam generating units with a rated heat input capacity greater than 100 million British thermal units per hour (MMBtu/hr). The rule defines a steam generating unit as not just a unit that produces steam, but any unit that combusts fuel to heat all other transfer mediums. The definition of a steam generating unit excludes process heaters:

> *Steam generating unit means a device that combusts any fuel or byproduct/waste and produces steam or heats water or heats any heat transfer medium. This term includes any municipal-type solid waste incinerator with a heat recovery steam generating unit or any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. This term does not include process heaters as they are defined in this subpart.*

The definition of a process heater is defined as follows:

> *Process heater means a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst.*

The annealing furnace it is not subject to this subpart since the rated heat input capacity is less than 100 MMBtu/hr.

The boilers are not subject to this subpart since the rated heat input capacity of each boiler is less than 100 MMBtu/hr.

In conclusion, no emission sources for the project are subject to this subpart because the sources have less than the minimum heat capacity threshold of 100 MMBtu/hr.

4.1.3.3 40 CFR 60 SUBPART DC – STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL- INSTITUTIONAL STEAM GENERATING UNITS

The NSPS – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60 Subpart Dc (60.40c – 48c), regulates air emissions from steam generating units with a rated heat input capacity between 10 and 100 MMBtu/hr. The definition of a steam generating unit is identical to the definition specified in the preceding subchapter.

The natural gas-fired boilers at the facility have a rated heat input capacity of 45.50 MMBtu/hr; therefore, this subpart applies to these sources.

The APL annealing furnace has a rated heat input capacity of 93.65 MMBtu/hr and does not meet the definition of a steam generating unit as the furnace is direct fired and does not transfer heat from the combustion of natural gas to a heat transfer medium. As such, the furnace is not subject to this subpart.

The natural gas-fired ARP has a heat input capacity of 13 MMBtu/hr; however, this emission source is not considered a steam generating unit. In the pre-heating, start-up phase, water is sprayed into a direct-fired reactor unit the burner region temperature reaches 700°C. The reactor is heated by means of natural gas burners that are aligned tangentially around the perimeter. The burner arrangement allows heat to be transferred by direct contact. The heating system is the same during acid spray mode/normal operation mode. This regulation does not apply to devices that either (1) combust fuel but do not transfer heat from combustion gases to a heat transfer medium or (2) transfer heat to heat transfer medium by direct contact or intermixing of the combustion gases as documented in an EPA memorandum authored by Bruce Jordan dated 11/17/1992 (ADI Control Number PS36). The ARP burners fall into the latter category and, therefore, are not subject to this subpart.

Emission standards for Sulfur Dioxide and Particulate Matter as stated in 40 CFR 60.42c and 40 CFR 60.43c, respectively, apply to sources that combust coal, coal refuse, oil, wood, or any combination of these fuels. Performance testing and emissions monitoring requirements specified in 40 CFR 60.44c – 40 CFR 60. 47c apply to sources which have Sulfur Dioxide and/or Particulate Matter emissions. Since the boilers combust natural gas, emission standards, performance testing, and emission monitoring requirements defined in this subchapter do not apply. The only requirement addressing these units is recording the amount of fuel combusted daily in the units according to 40 CFR 60.48c(g)(1). Natural gas meters are installed on the units to allow for daily monitoring of natural gas consumption. AMC shall keep records of the amount of fuel combusted daily for a period of two years following the date of such a record.

4.1.3.4 40 CFR 60 SUBPART IIII – STANDARDS OF PERFORMANCE FOR STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES

NSPS Subpart IIII provides performance standards for stationary compression ignition (CI) internal combustion engine (ICE) manufacturers, owners, and operators. For owners and operators of CI ICE, NSPS Subpart IIII provides performance standards for CI ICE that commenced construction, reconstruction, or modification after July 11, 2005. If subject to NSPS Subpart IIII, engine operators must meet the specified emission standards and fuel type specifications.

The diesel engines at AMC (Emergency Engines discussed in Section 1.2 of this application) are all emergency CI ICE and are subject to NSPS Subpart IIII. Emission standards for emergency engines are defined in 40 CFR 60.4205. The rule requires emergency engines with a model year of 2007 or later and a displacement of less than 30 liters per cylinder to meet the non-road emission standards for new engines listed in 40 CFR 60.4202. At the time of purchase, AMC will request compliance documentation from the engine manufacturers and will maintain these records. The engines are maintained according to the manufacturer’s emission-related instructions. Run-time meters are installed on all engines to monitor their operating times as required by 40 CFR 60.4209(a) and records are maintained according to 40 CFR 60.4214(b). The fuel burned in the engines must meet the specifications defined in 40 CFR 60.4207. Specifically, for engines with a displacement of less than 30 liters per cylinder, the diesel fuel must meet the requirements of 40 CFR 80.510(b) for non-road diesel fuel. AMC meets this requirement by only burning diesel fuel that has sulfur content of 15 ppm or less in the subject engines.

4.1.3.5 40 CFR 60 SUBPART KC – STANDARDS OF PERFORMANCE FOR VOLATILE ORGANIC LIQUID STORAGE VESSELS (INCLUDING PETROLEUM LIQUID STORAGE VESSELS) FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER OCTOBER 4, 2023

The NSPS – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After October 4, 2023 applies to each organic liquid storage vessel with a capacity greater than or equal to 75 m^3 (19,812.9 gal).

The diesel storage tanks at AMC each have a capacity of less than 75 m3 (19,812.9 gal). Additionally, the diesel fuel stored has a maximum true vapor pressure less than 0.25 psia; therefore, this regulation is not applicable. The storage tanks associated with the acid regeneration plant will not contain volatile organic liquid (VOL) as defined in 40 CFR 40 Subpart Kc; therefore, this regulation is not applicable to those tanks.

4.1.3.6 40 CFR 60 SUBPART TT – STANDARDS OF PERFORMANCE FOR METAL COIL SURFACE COATING

NSPS TT provides standards of performance applicable to affected facilities in a metal coil surface coating operation: each prime coat operation, each finish coat operation, and each prime and finish coat operation combined when the finish coat is applied wet on wet over the prime coat and both coatings are cured simultaneously. This subpart applies to affected facilities that commence construction, modification or reconstruction after January 5, 1981.

The surface coating operations at AMC applies a thin coat of varnish that is dried and then cured; therefore, AMC coating operations are subject to this regulation and AMC will comply with the applicable requirements.

4.1.4 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT

The National Emission Standards for Hazardous Air Pollutants (NESHAP) codified under 40 CFR 63. NESHAP are emission standards for HAP that are generally applicable to major sources of HAPs, but also apply to certain area sources of HAPs. A HAP major source is defined as having potential emissions in excess of 10 tons per year (tpy) for any individual HAP and/or 25 tpy for total HAPs.

NESHAP apply to specific pollutant sources, to sources in specifically regulated industrial source categories, or to facilities not regulated as a specific industrial source type on a case-by-case basis. AMC is a major source for HAPs. An applicability analysis of potentially applicable NESHAP subparts is presented below.

4.1.4.1 40 CFR 63 SUBPART A – GENERAL PROVISIONS

All affected sources are subject to the general provisions of NESHAP Subpart A unless specifically excluded by the source-specific NESHAP. NESHAP Subpart A requires initial notification, performance testing, recordkeeping, and monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable. Because AMC is subject to another 40 CFR 63 subpart, the provisions of Subpart A are also applicable.

4.1.4.2 40 CFR 63 SUBPART CCC – NESHAP FOR STEEL PICKLING - HCL PROCESS FACILITIES AND HYDROCHLORIC ACID REGENERATION PLANTS

The provisions of 40 CFR 63 Subpart CCC – NESHAP for Steel Pickling – HCl Process Facilities and Hydrochloric Acid Regeneration Plants (40 CFR 63.1155 – 40 CFR 63.1166) regulate HCl and chlorine (Cl_2) emissions from pickling lines, hydrochloric acid regeneration plants, and HCl storage vessels. This rule applies to the pickling line scrubber, the tank farm scrubber, the ARP and the ARP scrubber. The HCl tanks which are routed to a scrubber are subject because they meet the definition of "hydrochloric acid storage vessel" included in 40 CFR 63.1156.

As per 40 CFR 63.1158(a)(1), gases emitted from continuous pickling lines may not exceed 6 parts per million by volume (ppmv) HCl or show 99% or greater HCl collection efficiency. This emission standard applies to the pickling line scrubber, which control emissions from pickling line, including HCl pickling and HCl supply tanks.

As per 40 CFR 63.1158(b), gases emitted from the ARP may not exceed 12 ppmv HCl and 6 ppmv Cl_2. These emission limitations apply to the ARP scrubber, which controls process emissions from the ARP.

The tank farm scrubber controls emissions from HCl storage vessels, not the ARP or the pickling lines, so the tank farm scrubber is subject to the emission limitations of 40 CFR 63.1158(a)(1) and 40 CFR 63.1158(b). However, the tank farm scrubber is subject to the requirements discussed below for HCl storage vessels.

As per 40 CFR 63.1159(b), emissions from HCl storage vessels must be controlled at all times. Except during loading and unloading of HCl, a closed-vent system must be provided for each HCl storage vessel. A closed-vent system is defined as follows:

> *Closed-vent system means a system that is not open to the atmosphere and that is composed of piping, ductwork, connections, and, if necessary, flow-inducing devices that transport emissions from a process unit or piece of equipment (e.g., pumps, pressure relief devices, sampling connections, open-ended valves or lines, connectors, and instrumentation systems) back into a closed system or into any device that is capable of reducing or collecting emissions.*[3]

During loading and unloading, HCl storage vessels must be controlled either by using enclosed lines or by ventilating emissions through an air pollution control device.

AMC complies with the restrictions on HCl storage vessels by routing emissions from the HCl storage vessels to the tank farm scrubber control device at all times. Note that a scrubber control device is considered a type of closed-vent system as defined in 40 CFR 63 Subpart CCC, so the use of a scrubber control device is appropriate even when not in the process of loading or unloading the HCl storage vessels.

40 CFR 63 Subpart CCC requires an initial stack test to demonstrate compliance with the applicable emission limitations and to establish certain parameters for the ARP and the pickling line control devices scrubbers. Subsequent performance tests to measure the concentration of HCl

[3] 40 CFR 63.1156, dated June 22, 1999.

and/or Cl_2 in gases exiting these scrubbers must be conducted either annually or an alternative schedule approved by ADEM, but no less frequently than every 2.5 years. Continuous monitoring of certain operating parameters for these scrubbers is also required as per 40 CFR 63.1162(a) and (b).

The tank farm scrubber is not subject to performance testing requirements as it only controls emissions from HCl storage vessels only, not from the pickling lines or ARP. However, the tank farm scrubber and the HCl storage vessels which are controlled by that scrubber must be inspected semiannually as per 40 CFR 63.1162(c).

Per 40 CFR 63.1156, steel pickling is defined as follows:

> *Steel pickling means the chemical removal of iron oxide mill scale that is formed on steel surfaces during hot rolling or hot forming of semi-finished steel products through contact with an aqueous solution of acid where such contact occurs prior to shaping or coating of the finished steel product. This definition does not include removal of light rust or scale from finished steel products or activation of the metal surface prior to plating or coating.*

The intent of the HCl utilized in this system is to activate the metal surface prior to coating. Additionally, the system does not chemically remove iron oxide mill scale that is formed on steel surfaces during hot rolling or hot forming. The HCl removes a very light surface oxide that may develop in the final cooling and brief time the steel surface is exposed to the atmosphere. Thus, the associated tank farm scrubber is not subject to the emission standards in 40 CFR 63.1158(a)(1).

Emissions from the planned HCl tanks which will be routed to the scrubber, are subject to this subpart as they meet the definition of hydrochloric acid storage vessels per 40 CFR 63.1156:

> *Hydrochloric acid storage vessel means a stationary vessel used for the bulk containment of virgin or regenerated hydrochloric acid.*

As per 40 CFR 63.1159(b), emissions from HCl storage vessels must be controlled at all times. Except during loading and unloading of HCl, a closed-vent system must be provided for each HCl storage vessel. A closed-vent system is defined in 40 CFR 63.1156 as follows:

> *Closed-vent system means a system that is not open to the atmosphere and that is composed of piping, ductwork, connections, and, if necessary, flow-inducing devices that transport emissions from a process unit or piece of equipment (e.g., pumps, pressure relief devices, sampling connections, open-ended valves or lines, connectors, and instrumentation systems) back into a closed system or into any device that is capable of reducing or collecting emissions.*

During loading and unloading, HCl storage vessels must be controlled either by using enclosed lines or by ventilating emissions through an air pollution control device.

AMC will comply with the requirements for HCl storage vessels by using a closed-vent system for routing emissions from the HCl storage vessels to a scrubber control device at all times. As per the definition of a closed-vent system in 40 CFR 63 Subpart CCC, the use of a scrubber control device via a closed-vent system is appropriate even when not in the process of loading or unloading the HCl storage vessels. These HCl storage vessels shall be inspected semiannually to determine that the closed-vent system and air pollution control device are installed and operating when required, as per 40 CFR 63.1162(c).

Notification, reporting, and recordkeeping requirements outlined in 40 CFR 63.1163, 40 CFR 63.1164, and 40 CFR 63.1165, respectively, shall be followed.

4.1.4.3 40 CFR 63 SUBPART SSSS – NESHAP FOR HAZARDOUS AIR POLLUTANT: SURFACE COATING OF METAL COIL

40 CFR 63 Subpart SSSS provides HAP emission standards and compliance activities for facilities that are a major source of HAP at which a metal coil surface coating operation is performed.

AMC will operate multiple coil coating lines onsite and thus will be subject to this subpart; however, there is not expected to be any HAP-containing varnishes and/or solvents utilized for these coating lines. AMC will comply with the applicable sections of this subpart.

4.1.4.4 40 CFR 63 SUBPART ZZZZ - NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES

40 CFR 63 Subpart ZZZZ provides HAP emission limitations and operating limitations for stationary reciprocating internal combustion engines (RICE), including emergency engines, located at facilities that are major or area sources of HAP emissions. This rule categorizes stationary RICE according to rated engine power, date of construction, and model year. Emission limitations and work practice standards vary depending upon the engine category. The proposed emergency diesel generators will be model year 2009 or later. The engines vary in kilowatt (kW) rating from 250 kW to 2,700 kW. Table 2c to this subpart provides requirements for SI and CI RICE during normal operation and periods of startup.

As per 40 CFR 63.6590(b)(1)(i), new emergency RICE over 500 hp at major HAP sources are only subject to the initial notification requirements of 40 CFR 63 Subpart ZZZZ. The 2,000-kW emergency diesel generator is subject to this requirement and will comply by meeting the requirements of NSPS Subpart IIII. No further requirements apply to this engine under 40 CFR 63 Subpart ZZZZ or 40 CFR 63 Subpart A.

As per 40 CFR 63.6590(c)(6), new or reconstructed emergency or limited use stationary RICE with a site rating of less than 500 hp at major HAP sources meet the requirements of 40 CFR 63 Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII or 40 CFR 60 Subpart JJJJ. The 250-kW emergency diesel generator is subject to this requirement and will comply by meeting the requirements of NSPS Subpart IIII. No further requirements will apply to this engine under 40 CFR 63 Subpart ZZZZ.

4.1.4.5 40 CFR 63 SUBPART DDDDD – NESHAP FOR INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL BOILERS AND PROCESS HEATERS

Emission limits and work practice standards for sources that are subject to 40 CFR 63 Subpart DDDDD vary by fuel type, unit design and size, and new versus existing sources covered under different subcategories. The twenty-one subcategories are listed in 40 CFR 63.7499. Table 1 of this subpart lists eighteen subcategories (based on fuel type) for which emission limits have been established for new industrial boilers or process heaters that have a heat input rating of 10 MMBtu/hr or greater. Work practice standards, as opposed to emission limitations, are prescribed to those new subcategories which are not listed in Table 1.

As stated in 40 CFR 63.7490(b)-(d), a boiler or process heater is new or reconstructed if construction or reconstruction commences after June 4, 2010, otherwise, a boiler or process heater is considered to be existing.

Process heater is defined in 40 CFR 63.7575 as follows:

> *Process heater means an enclosed device using controlled flame, and the unit's primary purpose is to transfer heat indirectly to a process material (liquid, gas, or solid) or to a heat transfer material (e.g., glycol or a mixture of glycol and water) for use in a process unit, instead of generating steam. Process heaters are devices in which the combustion gases do not come into direct contact with process materials….*

Boiler is defined in 40 CFR 63.7575 as follows:

> *Boiler means an enclosed device using controlled flame combustion and having the primary purpose of recovering thermal energy in the form of steam or hot water….*

Metal Process Furnace is defined in 40 CFR 63.7575 as follows:

> *Metal process furnaces include natural gas-fired annealing furnaces, preheat furnaces, reheat furnaces, aging furnaces, heat treat furnaces, and homogenizing furnaces.*

The two boilers have heat input ratings of 45.5 MMBtu/hr each and utilize natural gas as combustion fuel. Since natural gas combustion units are not a subcategory listed in Table 1 of the Boiler MACT, these boilers are not subject to the emission limitations established in the Boiler MACT. Because they each have a heat input capacity greater than 10 MMBtu/hr, the boilers are subject to an annual tune up to be conducted in accordance with 40 CFR 63.7540(a)(10)(i)-(vi) and Table 3 of the Boiler MACT.

The ARP does not include a boiler and does not meet the definition of a process heater as defined in 40 CFR 63.7575. The ARP will have natural gas burners installed tangentially at the circumference of the shell and charge the interior of the roaster with hot combustion gases, and thus provide "direct heat" and do not use a heat transfer medium; therefore, the ARP is not subject to this rule.

The two curing ovens with respective regenerative thermal oxidizers each have a heat input rating of 11.88 MMBtu/hr and utilize natural gas as combustion fuel. Since natural gas combustion units are not a subcategory listed in Table 1 of 40 CFR 63 Subpart DDDDD, the ovens are not subject to the established emission limitations. Additionally, the curing ovens do not meet the definition of process heaters due to being heated with direct-fired natural gas burners; therefore, they are not subject to the Boiler MACT requirements.

The pickling line annealing furnace has a heat input rating of 93.65 MMBtu/hr and utilizes natural gas as combustion fuel. Since natural gas combustion units are not a subcategory listed in Table 1 of 40 CFR 63 Subpart DDDDD, the pickling line annealing furnace is not subject to the established emission limitations, maintenance, reporting, and recordkeeping requirements.

4.1.4.6 40 CFR 63 SUBPART EEEEE – NESHAP FOR IRON AND STEEL FOUNDRIES

The provisions of 40 CFR 63 Subpart EEEEE – NESHAP for Iron and Steel Foundries (40 CFR 63.7680 – 40 CFR 63.7765) regulate existing and new iron and steel foundries. As per 40 CFR 63.7681, the rule applies to owners and operators of iron and steel foundries that are (or are part of) a major source of HAP emissions. Iron and steel foundry is defined in 40 CFR 63.7765 as follows:

> *Iron and steel foundry means a facility or portion of a facility that melts scrap, ingot, and/or other forms of iron and/or steel and pours the resulting molten metal into molds to produce final or near final shape products for introduction into commerce. Research and development facilities and operations that only produce non-commercial castings are not included in this definition.*

AMC does not perform these types of activities. As such, AMC is not an iron or steel foundry as defined in 40 CFR 63.7765; therefore, this regulation is not applicable.

4.1.4.7 40 CFR 63 SUBPART FFFFF – NESHAP FOR INTEGRATED IRON AND STEEL MANUFACTURING FACILITIES

The provisions of 40 CFR 63, Subpart FFFFF – National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing Facilities apply to integrated iron and steel manufacturing facilities. As per 40 CFR 63.7781, this rule applies to owners and operators of integrated iron and steel manufacturing facilities that are (or are part of) a major source of HAP emissions. Integrated iron and steel manufacturing facility is defined in 40 CFR 63.7852 as follows:

> *Integrated iron and steel manufacturing facility means an establishment engaged in the production of steel from iron ore.*

AMC does not produce steel from iron ore. As such, AMC is not an integrated iron and steel manufacturing facility as defined in 40 CFR 63.7852; therefore, this regulation is not applicable.

4.1.4.8 40 CFR 63 SUBPART NNNNN – NESHAP: HYDROCHLORIC ACID PRODUCTION

The provisions of 40 CFR 63, Subpart NNNNN – National Emission Standards for Hazardous Air Pollutants: Hydrochloric Acid Production provides emission standards and work practice standards for HAP emitted from HCl production. As per 40 CFR 63.8985(b)(2), AMC is not subject to 40 CFR 63, Subpart NNNNN because they are subject to 40 CFR 63, Subpart CCC.

4.1.4.9 40 CFR 63 SUBPART YYYYY – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AREA SOURCES: ELECTRIC ARC FURNACE STEELMAKING FACILITIES

The provisions of 40 CFR 63 Subpart YYYYY applies to EAF steelmaking facilities that are an area source of HAPs. As AMC is classified as a major source of HAPs, this regulation will not be applicable.

4.2 40 CFR 64 COMPLIANCE ASSURANCE MONITORING

Compliance Assurance Monitoring Rule (CAM), established in 40 CFR 64, applies to certain pollutant-specific emissions units (PSEU) that are located at a facility where a Title V permit is required. This regulation only applies to PSEUs that use a control device to achieve compliance with an emission limit, and whose pre-control emissions exceed the major source thresholds under the Title V operating permit program.

CAM requires facilities to prepare and submit monitoring plans for certain subject PSEUs with certain Title V permit applications. For a CAM subject "Large PSEU", whose post-controlled emissions are greater than the major source emission thresholds, a CAM plan is required to be submitted with the initial Title V permit application as per 40 CFR 64.5(a)(1). For all other CAM subject PSEUs (non-large PSEUs), whose post-controlled emissions are less than the major source emission thresholds, a CAM plan is required to be submitted with the Title V permit renewal application as per 40 CFR 64.5(b).

There are no Large PSEUs subject to CAM at AMC.

The following table summarizes the CAM applicability for the potentially applicable non-large PSEUs.

TABLE 4-1 COMPLIANCE ASSURANCE MONITORING (CAM) APPLICABILITY

Source	Pre-Controlled Pollutant Exceeding Major Source Threshold	Applicable Emission Limit	NSPS or NESHAP Enacted after November 15, 1990 (Y/N)	CAM Applicability (Y/N)
Pickling Line Scrubber	PM_{10}, HCl	335-3-14-.04 (PSD/BACT); 40 CFR 63 CCC	Y (HCl)	Y (PM10)
Tank Farm Scrubber	HCl	335-3-14-.04 (PSD/BACT); 40 CFR 63 CCC	Y (HCl)	N
ARP Scrubber	HCl, Cl_2	40 CFR 63 CCC	Y	N
Curing Oven + RTO 1	VOC	335-3-14-.04 (PSD/BACT)	N	Y
Curing Oven + RTO 2	VOC	335-3-14-.04 (PSD/BACT)	N	Y

Source	Pre-Controlled Pollutant Exceeding Major Source Threshold	Applicable Emission Limit	NSPS or NESHAP Enacted after November 15, 1990 (Y/N)	CAM Applicability (Y/N)
Shot blaster	PM	335-3-14-.04 (PSD/BACT)	N	Y
Cold Rolling Mill 1	PM	335-3-14-.04 (PSD/BACT)	N	Y
Cold Rolling Mill 2	PM	335-3-14-.04 (PSD/BACT)	N	Y

The remaining emission sources at AMC are not subject to CAM as they either do not use a control device, do not have an applicable emission limit, or they have pre-controlled emission rates less than the Title V major source thresholds.

4.3 40 CFR 68 CHEMICAL ACCIDENT PREVENTIONS PROVISIONS

The accidental release prevention program is mandated by section 112(r) of the CAA (amended) and is codified in 40 CFR 68. The provisions of 40 CFR 68 apply to a defined list of regulated substances. The AMC facility stores large quantities of HCl; however, the maximum concentration of HCl stored is below the 37% threshold established in Table 1 to 40 CFR 68.130, so the HCl stored at AMC is not considered a regulated substance. AMC is therefore not subject to the requirements of 40 CFR 68.

4.4 40 CFR 82 STRATOSPHERIC OZONE PROTECTION REGULATIONS

The requirements originating from Title VI of the Clean Air Act, entitled Protection of Stratospheric Ozone, are contained in 40 CFR Part 82. Subparts A through E and Subpart G of 40 CFR Part 82 are not applicable to the mill. 40 CFR Part 82 Subpart F, Recycling and Emissions Reduction, potentially applies if the facility maintains, repairs, services, or disposes of appliances that utilize Class I or Class II ozone depleting substances. The Calvert Mill will comply with the applicable provisions of this regulation including the changes recently promulgated by EPA.

4.5 ALABAMA AIR QUALITY REGULATIONS

4.5.1 ADEM ADMIN. CODE R. 335-3-4 – CONTROL OF PARTICULATE EMISSIONS

Emissions of particulate matter and opacity from stationary sources are regulated in AAC Chapter 335-3-4.

335-3-4-.01 Visible Emissions

(1)(a) Except as provided in subparagraphs (b), (c), (d), or (e) of this paragraph, and paragraph (3) of this rule, no person shall discharge into the atmosphere from any source of emission, particulate of an opacity greater than that designated as twenty percent (20%) opacity, as determined by a six (6) minute average.

(1)(b) For a person not covered by paragraphs (3), (4), (5), and (6) of this rule, during one six (6) minute period in any sixty (60) minute period, a person may discharge into the atmosphere from any source of emission, particulate of an opacity not greater than that designated as forty percent (40%) opacity.

335-3-4-.02 - Fugitive Dust and Fugitive Emissions

ADEM Admin. Code R. 335-3-4-3-.02 requires usage of reasonable precautions to minimize fugitive dust and fugitive emissions from sources such as roadways and storage piles. The mill utilizes reasonable precautions to minimize fugitive emissions, including watering plant roads, reducing speed of vehicular traffic to a point below that at which dust emissions are created, by paving, by the application of binders to the road surface at any time the road surface is found to allow the creation of dust emissions or, by any combination of the above methods which results in the prevention of dust becoming airborne from the road surface.

335-3-4-.03 Fuel Burning Equipment

ADEM Admin. Code R. 335-3-4-3-.03 regulates PM emissions from fuel burning equipment. Any fuel burning equipment that meets the applicable definition for fuel-burning equipment must comply with the Class 1 County limit for particulate emissions from fuel burning sources as specified below:

(1) Class 1 Counties: No person shall cause or permit the emission of particulate matter from fuel-burning equipment in a Class 1 County in excess of the amount shown in Table 4-2 for the heat input allocated to such source. For sources in Class 1 Counties, interpolation of the data in Table 4-2 for heat input values between 10 and 250 MMBtu/hr shall be accomplished by the use of the equation:

$E = 1.38H^{-0.44}$

where:

E = Emissions in lb/MMBtu

H = Heat Input in MMBtu/hr.

AAC 335-3-4-.03 Table 4-2 is provided below:

TABLE 4-2 ALLOWABLE PARTICULATE MATTER EMISSION BASED ON HEAT INPUT

Heat Input (MMBtu/hr)	Allowable Emissions (lb/MMBtu)	
	Class 1 County	Class 2 County
1	0.5	0.8
10	0.5	0.8
20	0.37	0.53
40	0.27	0.35

Heat Input (MMBtu/hr)	Allowable Emissions (lb/MMBtu)	
	Class 1 County	Class 2 County
60	0.23	0.28
80	0.20	0.24
100	0.18	0.21
150	0.15	0.16
200	0.13	0.14
250	0.12	0.12
1,000,000	0.12	0.12

AAC 335-3-4-.03 only applies to fuel burning equipment as defined in AAC 335-3-1-.02(1)(ee): *Fuel-Burning Equipment shall mean any equipment, device, or contrivance and all appurtenances thereto, including ducts, breechings, fuel-feeding equipment, ash removal equipment, combustion controls, stacks, and chimney, used primarily, but not exclusively, to burn any fuel for the purpose of indirect heating in which the material being heated is not contacted by and adds no substance to the products of combustion.*

Fuel-burning equipment includes the annealing furnace and boilers at the facility but does not include engines as the engines are not used for indirect heating.

335-3-4-.04 Process Industries – General

Particulate emissions from all other process vents are regulated by ADEM Admin. Code R. 335-3-4-.04 as specified below:

(1) Class 1 Counties: No person shall cause or permit the emission of particulate matter in any one hour from any source in a Class 1 County in excess of the amount shown in Table 4-3 for the process weight per hour allocated to such source. For sources in Class 1 Counties, interpolation of the data in Table 4-3 for the process weight per hour values up to 60,000 lbs/hr shall be accomplished by use of the equation:

$E = 3.59P^{0.62}$

(P <30 tons/hr)

Interpolation and extrapolation of the data for process weight per hour values equal to or in excess of 60,000 lbs/hr shall be accomplished by use of the equation:

$E = 17.31P^{0.16}$

(P ≥30 tons/hr)

where

E = Emissions in pounds per hour

P = Process weight per hour in tons per hour.

AAC 335-3-4-.04 Table 4-3 is provided below:

TABLE 4-3 ALLOWABLE PARTICULATE MATTER EMISSION BASED ON PROCESS WEIGHT RATE

Process Weight Rate (lb/hr)	Allowable Emissions (lb/hr)	
	Class 1 County	Class 2 County
100	0.56	0.55
500	1.52	1.62
1,000	2.34	2.57
5,000	6.33	7.57
10,000	9.76	12.05
20,000	14.97	19.18
60,000	29.83	39.96
80,000	31.23	42.53
120,000	33.33	46.30
160,000	34.90	49.06
200,000	36.17	51.28
1,000,000	46.79	68.96

This regulation applies to all process emission sources at the mill that have a PM or PM_{10} emission limit.

4.5.2 ADEM ADMIN. CODE R. 335-3-5 – CONTROL OF SULFUR COMPOUND EMISSIONS

Emissions of sulfur dioxide are regulated in AAC Chapter 335-3-5, with only section 335-3-5.01 – Fuel Combustion being applicable to the Calvert Mill, as follows:

335-3-5-.01 Fuel Combustion

(1)*(a) Sulfur Dioxide Category I Counties. No person shall cause or permit the operation of a fuel burning installation in a Sulfur Dioxide Category I County or in Jefferson County in such a manner that sulfur oxides, measured as sulfur dioxide, are emitted in excess of 1.8 pounds per MMBtu heat input.*

This emission limit will be achieved through the use of natural gas as the sole source of fuel for the subject sources at AMC, including the furnaces and boilers. This emission limit does not apply to the engines at AMC as they do not burn fuel for indirect heating, and thus are not considered fuel burning equipment as defined in AAC 335-3-1-.02(1)(ee):

Fuel-Burning Equipment shall mean any equipment, device, or contrivance and all appurtenances thereto, including ducts, breechings, fuel-feeding equipment, ash removal equipment, combustion controls, stacks, and chimney, used primarily, but not exclusively, to burn any fuel for the purpose of indirect heating in which the material being heated is not contracted by and adds no substance to the products of combustion.

4.5.3 ADEM ADMIN. CODE R. 335-3-6 – CONTROL OF ORGANIC EMISSIONS

AAC 335-3-6 regulates emissions of volatile organic compounds (VOCs) as follows.

335-3-6-.03 Loading and Storage of VOC

All storage tanks do not store products having a vapor pressure greater than 1.5 pounds per square inch (psia).

335-3-6-.04 Fixed-Roof Petroleum Liquid Storage Vessels

All storage tanks containing petroleum liquid at the facility have capacities of less than 40,000 gallons, and thus are not subject to the requirements of AAC 335-3-6-.04 (Fixed-Roof Petroleum Storage Vessels).

335-3-6-.09 Pumps and Compressors

> *All pumps and compressors handling VOCs and located in Mobile County shall have mechanical seals or other equipment of equal efficiency for purposes of air pollution as may be approved by the Director.*

AMC has installed the required equipment on applicable pumps and compressors in order to comply with this rule.

335-3-6-.12 Solvent Metal Cleaning

Solvent metal cleaning is addressed in AAC 335-3-6-.12. The primary operation at AMC that uses solvents is cleaning sections associated with metal parts cleaning in machine shops. These units have an open top area of less than 10.8 square feet and thus the rule will not apply, as per AAC 335-3-6-.12(3)(a). If there are any such operations with open top areas of 10.8 square feet or greater, AMC will operate them in compliance with AAC 335-3-6-.12.

4.5.4 ADEM ADMIN. CODE R. 335-3-7 – CONTROL OF CARBON MONOXIDE EMISSIONS

Emissions of carbon monoxide (CO) are regulated in AAC 335-3-7, but only one rule refers to metal production. That rule identifies cupolas, blast furnaces, and basic oxygen steel furnaces, which are not present at AMC. Therefore, this regulation is not applicable

4.5.5 ADEM ADMIN. CODE R. 335-3-8 - CONTROL OF NITROGEN OXIDE EMISSIONS

Emissions of nitrogen oxides (NO_X) are regulated in AAC 335-3-8; however, the only potentially applicable rule is AAC 335-3-8-.05 New Combustion Sources, which applies to boilers with a capacity greater than 250 MMBtu/hr. The maximum rated heat input of the two boilers at AMC is 45.50 MMBtu/hr per boiler, for a total boiler maximum rated heat input capacity of 210 MMBtu/hr.

This is below the 250 MMBtu/hr threshold; therefore, this regulation does not apply to the boilers at AMC.

Stationary reciprocating internal combustion engines are regulated by AAC 335-8-.04. However, this regulation does not apply to the engines at AMC as they were not operated within the fine grid portion of the state during the NOx SIP Call Baseline Period. Therefore, this regulation is not applicable.

4.5.6 ADEM ADMIN. CODE R. 335-3- 10 - STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

ADEM Admin. Code r. 335-3-10 incorporates Federal Regulations of 40 CFR Parts 60. The Calvert Mill is subject to the provisions of NSPS Subparts A, Dc, IIII, and JJJJ and complies with the applicable requirements of this rule.

4.5.7 ADEM ADMIN. CODE R. 335-3- 11 - NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

ADEM Admin. Code r. 335-3-11 incorporates Federal Regulations of 40 CFR Parts 61 and 63 by reference. The Calvert Mill is subject to the provisions of Part 63 NESHAP Subparts A, N, CCC, and ZZZZ, and complies with the requirements of this rule.

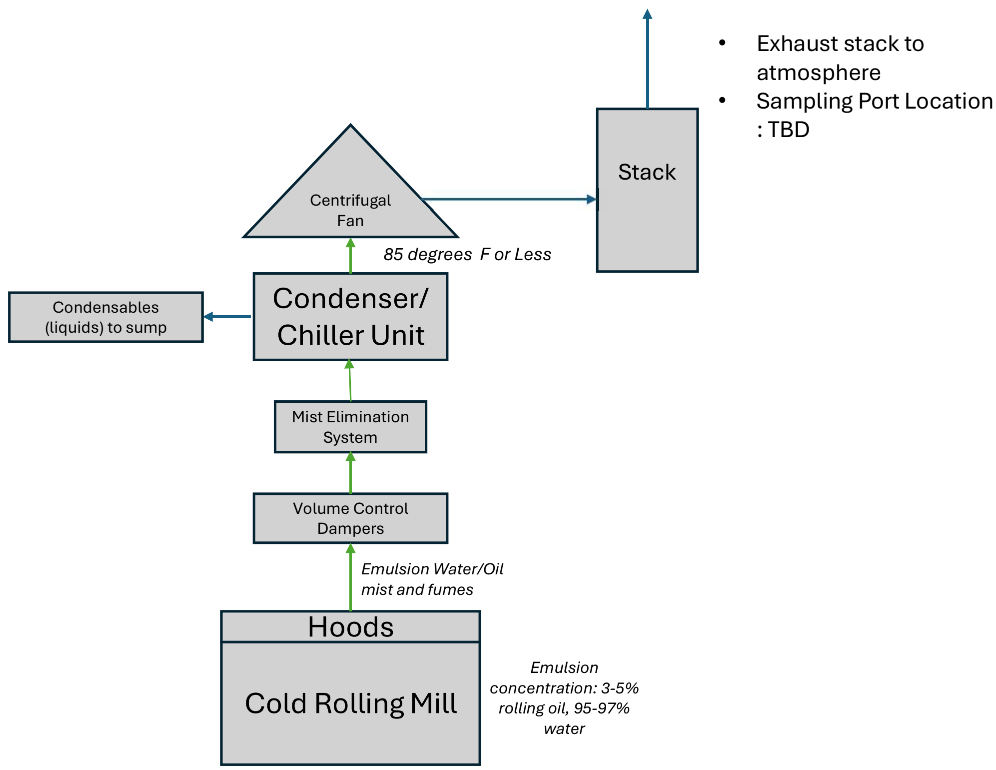
4.5.8 ADEM ADMIN. CODE R. 335- 3-14-.04 - PSD PERMITTING

The mill is a major source regulated by the PSD permitting regulations of ADEM Admin. Code r. 335-3-14-.04. The Calvert Mill complies with applicable requirements and will continue to evaluate PSD permitting applicability for all future projects.

ERM

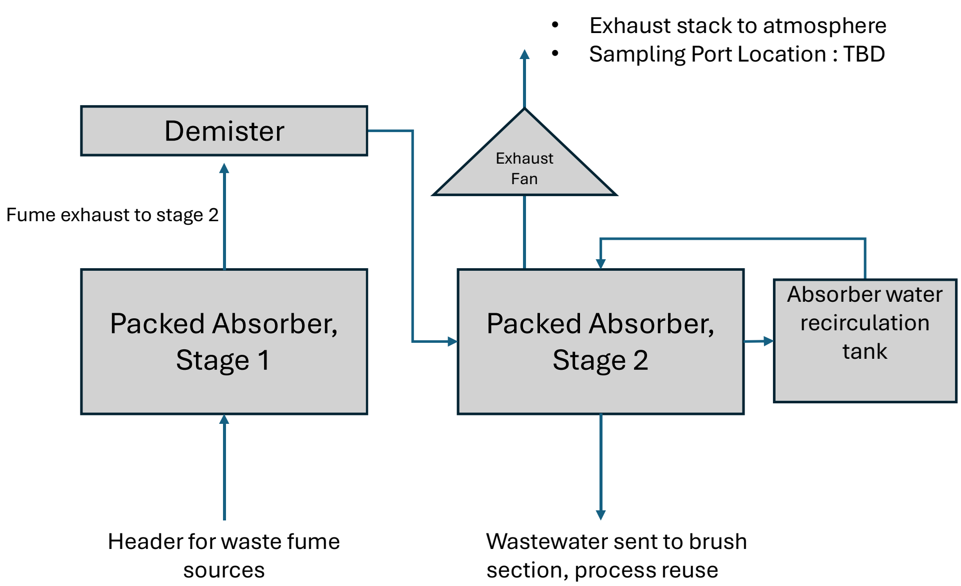
APPENDIX A PROCESS FLOW DIAGRAMS

Cold Rolling Mill Fume Exhaust System

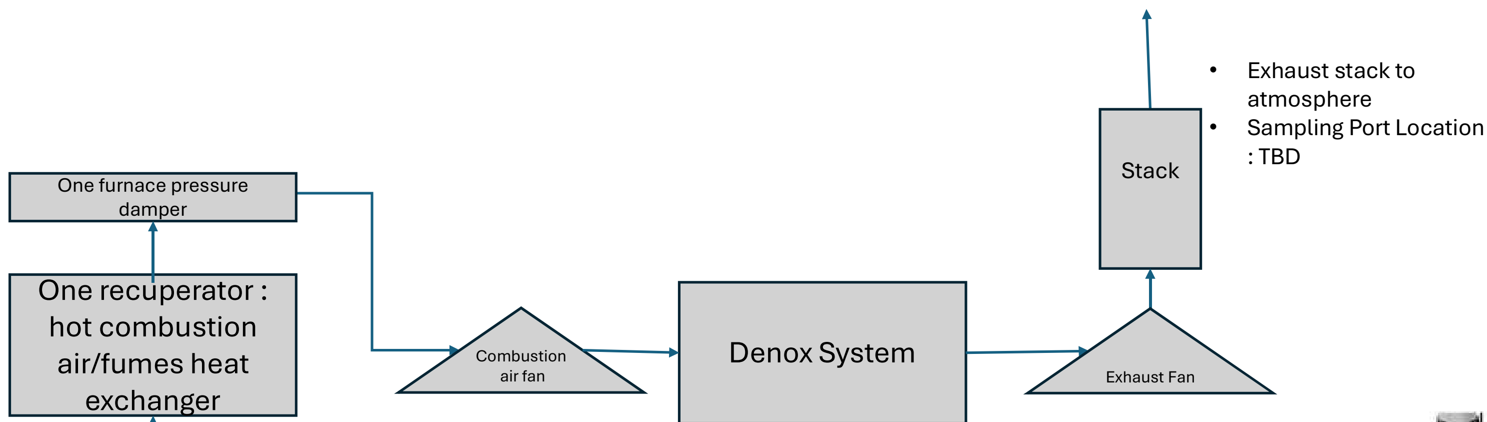


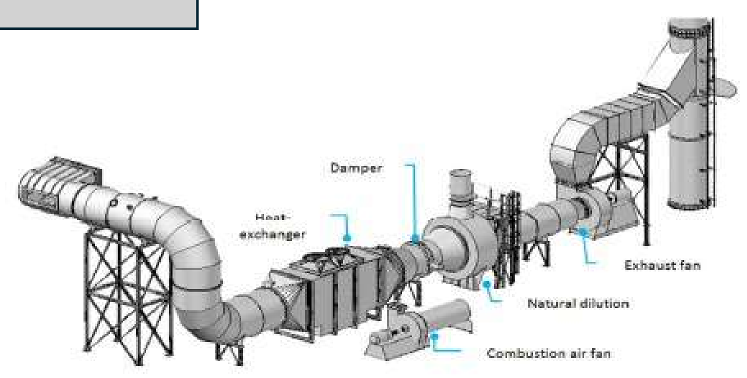
APL Pickling Section Scrubber System:

Two-stage exhaust scrubber with random packing and water circulation system



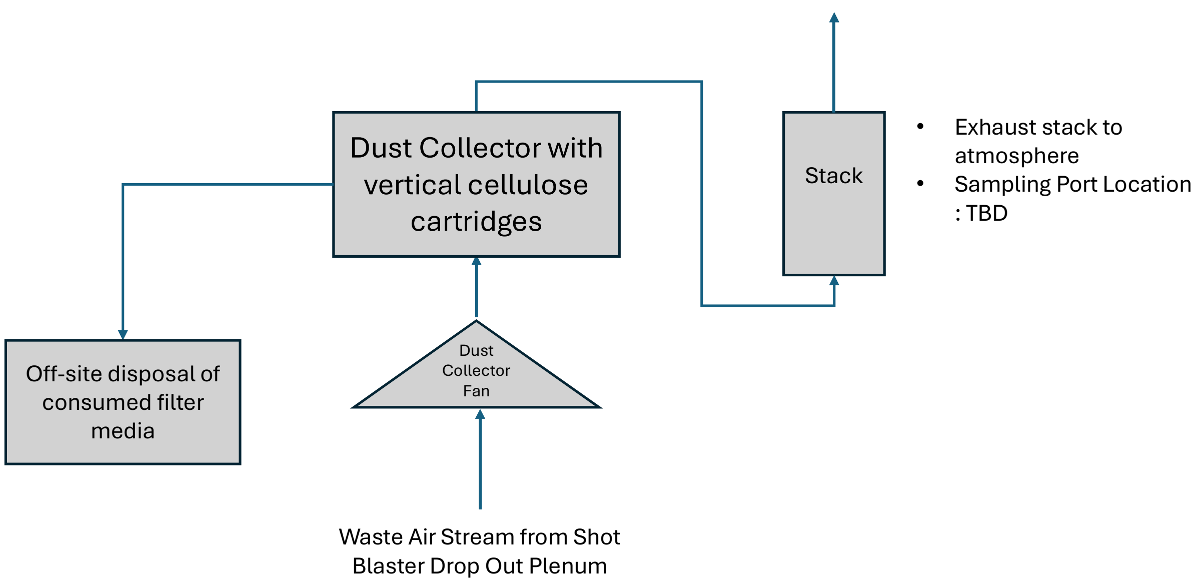
APL Annealing Furnace Waste Gas Exhaust System:



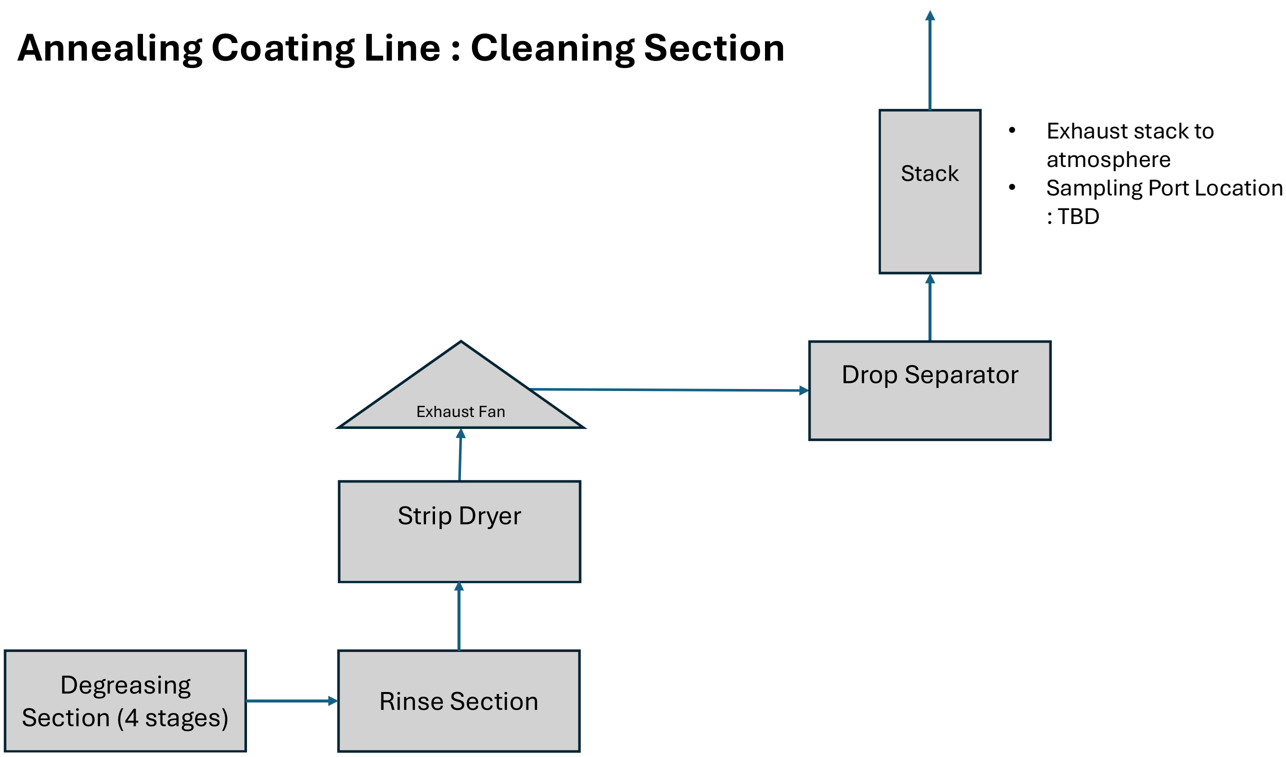


For analogy : Waste gas exhaust circuit

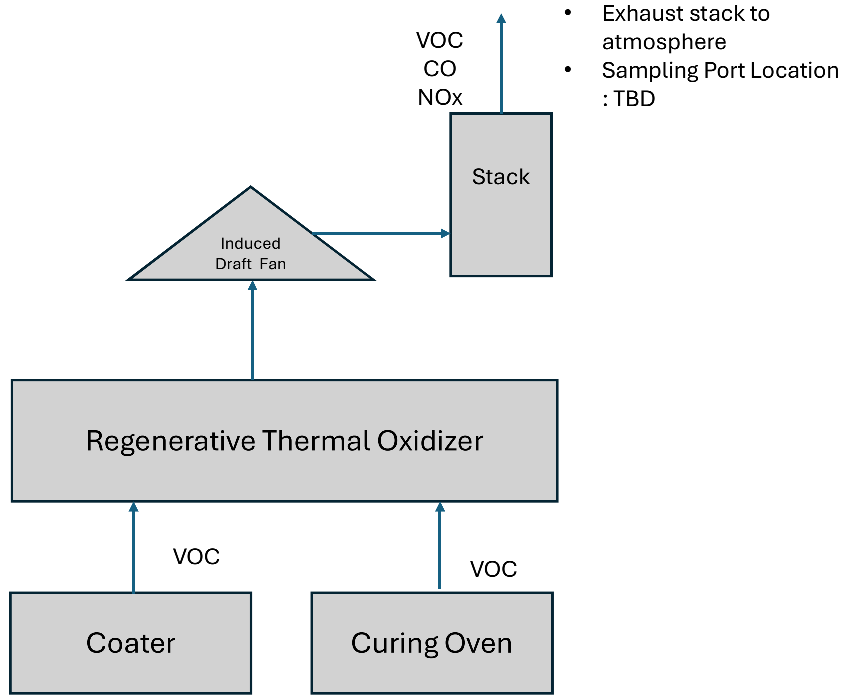
APL Shot Blaster Dust Collection System:



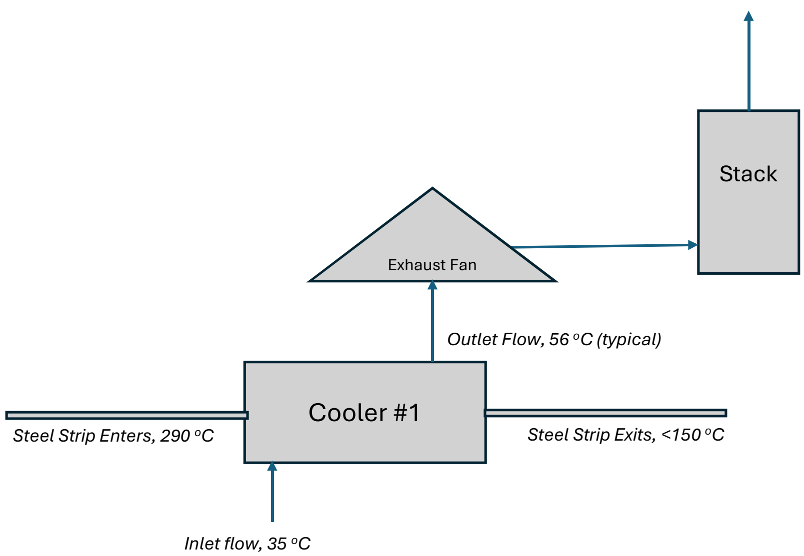
Annealing Coating Line : Cleaning Section



Annealing Coating Line : Curing Oven + RTO

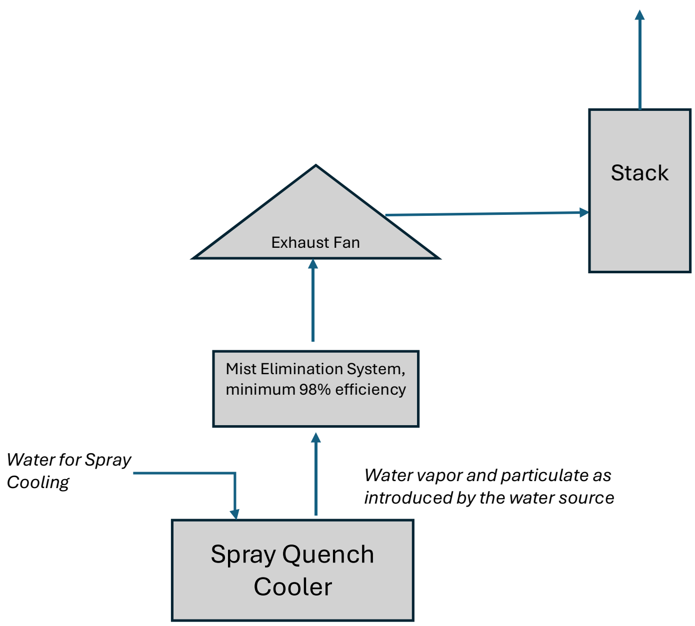


Annealing Coating Line : Curing Oven Section Cooler #1



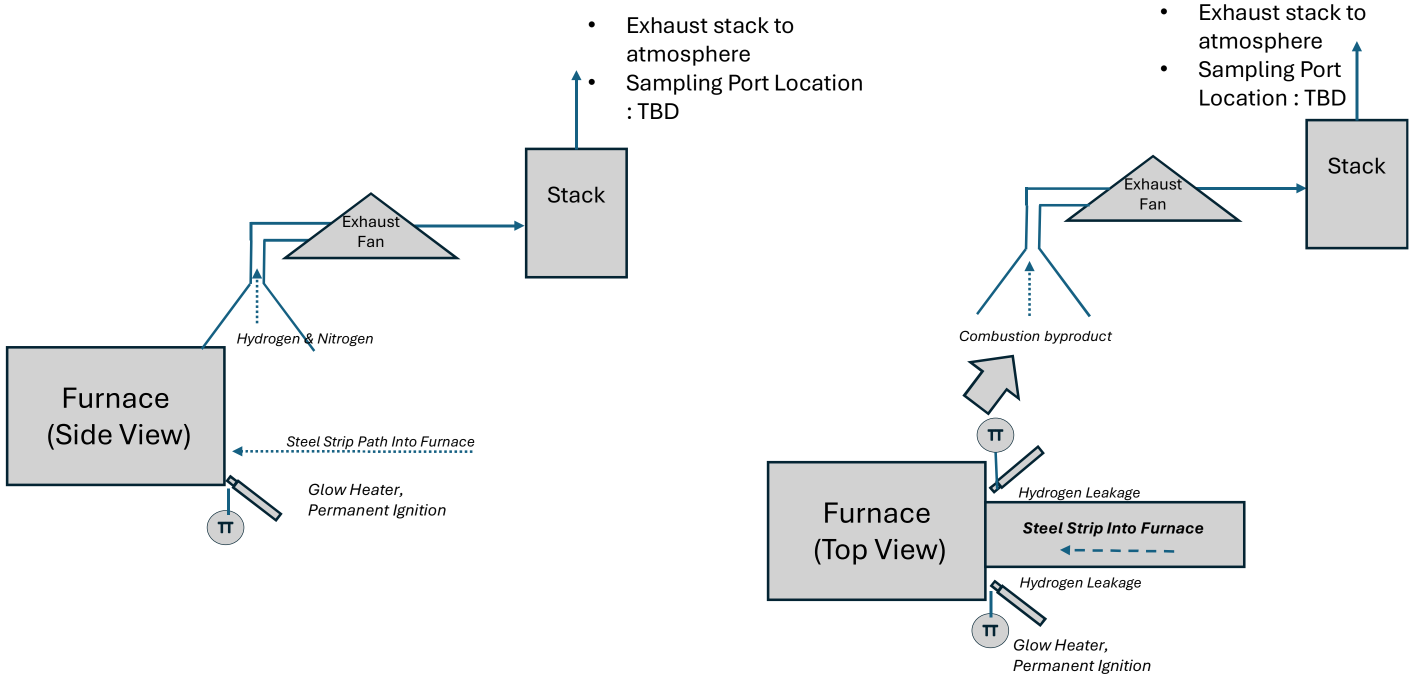
- Exhaust stack to atmosphere
- Sampling Port Location : TBD

Annealing Coating Line : Quench Cooler Section

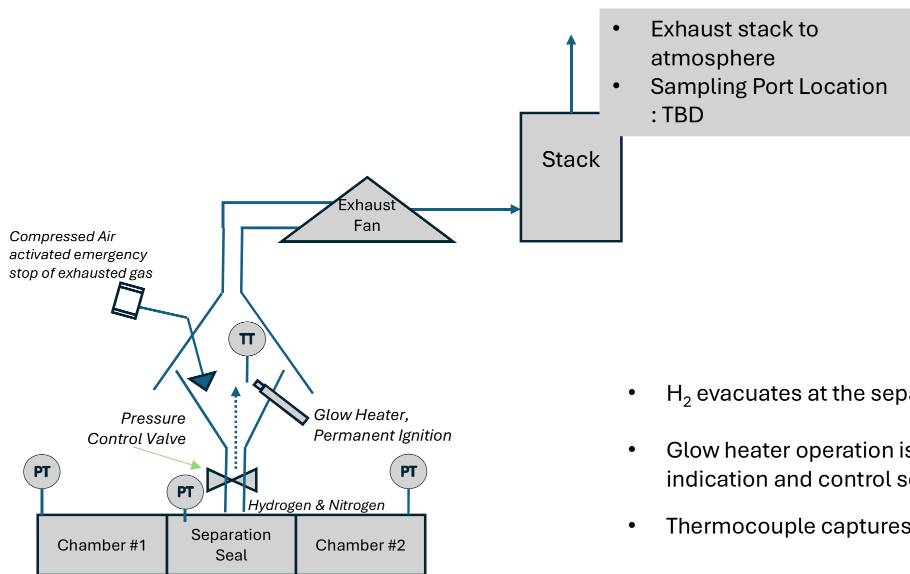


- Exhaust stack to atmosphere
- Sampling Port Location : TBD

Annealing Coating Line : Hydrogen Flares, Entry and Exit Seals (Two Locations)



Annealing Coating Line : Hydrogen Flares, Separation Seals (Three Locations)



- H_2 evacuates at the separation seal
- Glow heater operation is intermittent per pressure indication and control scheme, burning the H_2
- Thermocouple captures temp change – hydrogen burn
- Emergency plug activated with compressed air if glow heater operation is interrupted

APPENDIX B EMISSION CALCULATIONS

ArcelorMittal
Emissions Estimates for Proposed NOES Project
Calvert, Alabama

Facility Wide Potential Emissions Summary

Source	Total PM (tpy)	Total PM_{10}(1) (tpy)	Total $PM_{2.5}$(1) (tpy)	Filterable PM/PM_{10} (tpy)	Filterable $PM_{2.5}$ (tpy)	Condensable PM (tpy)	CO (tpy)	SO_2 (tpy)	NO_x (tpy)	VOC (tpy)	Pb (tpy)	Benzene (tpy)	Dichlorobenzene (tpy)	Formaldehyde (tpy)	Hexane (tpy)	Naphthalene (tpy)	Polycyclic Organic Matter (tpy)	Toluene (tpy)	Arsenic (tpy)	Beryllium (tpy)	Cadmium (tpy)	Chromium (tpy)	Cobalt (tpy)	Manganese (tpy)	Mercury (tpy)	Nickel (tpy)	Selenium (tpy)	Hydrochloric Acid (tpy)	Chlorine (tpy)	Xylenes (tpy)	1,3-Butadiene (tpy)	Acetaldehyde (tpy)	Acrolein (tpy)	Ammonia (tpy)	Total PAH (tpy)	Ammonia	Total HAP (tpy)	CO2e (tpy)
Cooling Tower	0.33	0.21	0.001	0.21	0.0007																																	
EGEN 1	0.30	0.30	0.30	0.29	0.29	0.007	5.14	0.009	9.41	9.41		4.85E-03		4.93E-04		8.13E-04		1.76E-03												0.001206893		0.000157584	4.9E-05		0.000812933		0.010	1,023.13
EGEN 2	0.04	0.04	0.04	0.04	0.04	0.0008	0.64	0.001	0.73	0.73		7.29E-04		3.06E-05		7.23E-05		3.20E-04												0.000222775		9.22E-04	0.0006		7.23042E-05		2.97E-03	127.89
Pickling Line Scrubber	1.55	1.55	1.36	0.87	0.68	0.68																						2.64									2.64	
Boiler 1	1.48	1.48	1.48	0.37	0.37	1.11	14.75	0.12	7.17	1.07	9.77E-05	4.10E-04	2.34E-04	1.47E-02	8.99E-04	1.19E-04	1.72E-05	6.64E-04	3.91E-05	2.34E-06	2.15E-04	2.74E-04	1.64E-05	7.42E-05	5.08E-05	4.10E-04	4.69E-06										0.02	23336.48
Boiler 2	1.48	1.48	1.48	0.37	0.37	1.11	14.75	0.12	7.17	1.07	9.77E-05	4.10E-04	2.34E-04	1.47E-02	8.99E-04	1.19E-04	1.72E-05	6.64E-04	3.91E-05	2.34E-06	2.15E-04	2.74E-04	1.64E-05	7.42E-05	5.08E-05	4.10E-04	4.69E-06										0.02	23336.48
Oven 1 + RTO 1	0.45	0.45	0.45	0.11	0.11	0.34	2.38	0.04	5.06	9.03	2.98E-05	1.25E-04	7.15E-05	4.47E-03	2.74E-04	3.64E-05	5.26E-06	2.03E-04	1.19E-05	7.15E-07	6.56E-05	8.34E-05	5.01E-06	2.26E-05	1.55E-05	1.25E-04	1.43E-06										0.01	9807.23
Oven 2 + RTO 2	0.45	0.45	0.45	0.11	0.11	0.34	2.38	0.04	5.06	9.03	2.98E-05	1.25E-04	7.15E-05	4.47E-03	2.74E-04	3.64E-05	5.26E-06	2.03E-04	1.19E-05	7.15E-07	6.56E-05	8.34E-05	5.01E-06	2.26E-05	1.55E-05	1.25E-04	1.43E-06										0.01	9807.23
Annealing Furnace	3.08	3.08	3.08	0.78	0.78	2.30	33.78	0.24	20.51	2.21	2.01E-04	8.45E-04	4.83E-04	0.03	1.85E-03	2.45E-04	3.55E-05	1.37E-03	8.04E-05	4.83E-06	4.42E-04	5.63E-04	3.38E-05	1.53E-04	1.05E-04	8.45E-04	9.65E-06									4.68	0.04	48034.42
Spray Roaster	0.31	0.31	0.31	0.31	0.31		4.68	0.03	3.09	0.31				0.00	2.56E-04			1.89E-04										0.56	0.55								1.11	6650.92
Shot Blaster Baghouse	2.95	0.42	0.04	0.42	0.04																																0.00	
ACL 1 Cleaning Section	1.66	1.66	1.66	1.66	1.66																																0.00	
ACL 2 Cleaning Section	1.66	1.66	1.66	1.66	1.66																																0.00	
Cold Rolling Mill 1	10.04	10.04	6.52	10.04	6.52																																0.00	
Cold Rolling Mill 2	10.04	10.04	6.52	10.04	6.52																																0.00	
Iron Oxide Bins w/ Bagfilters	1.35	1.35	1.31	0.76	0.72	0.59																															0.00	
Tank Farm Scrubber	0.90	0.90	0.88	0.51	0.49	0.40																						4.04	3.92								7.96	
ACL 1 Cooling Section	1.60	1.60	1.60	1.60	1.60					10.55																											0.00	
ACL 2 Cooling Section	1.60	1.60	1.60	1.60	1.60					10.55																											0.00	
ACL 1 Quenching	0.52	0.46	0.002	0.46	0.002																																0.00	
ACL 2 Quenching	0.52	0.46	0.002	0.46	0.002																																0.00	
ACL 1 Hydrogen Purging 1									0.96																												0.00	
ACL 1 Hydrogen Purging 2									1.60																													
ACL 1 Hydrogen Purging 3									1.60																													
ACL 1 Hydrogen Purging 4									1.60																													
ACL 1 Hydrogen Purging 5									1.60																													
ACL 2 Hydrogen Purging 1									0.96																												0.00	
ACL 2 Hydrogen Purging 2									1.60																													
ACL 2 Hydrogen Purging 3									1.60																													
ACL 2 Hydrogen Purging 4									1.60																													
ACL 2 Hydrogen Purging 5									1.60																													
IA - APL Cooling Section	2.09	2.09	0.00	2.09	0.00																																	
Total	44.41	41.63	30.76	34.75	23.88	6.88	78.50	0.59	72.93	53.97	0.0005	0.01	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.24	4.47	0.00	0.00	0.00	0.00	0.00	0.00	4.68	11.81	122123.78

ArcelorMittal
Calvert, Alabama
Proposed NOES Project
PSD Applicability Analysis
Comparison of Project Emissions to PSD Significant Emission Rates

	CO_2e Average Annual Emissions	PM Average Annual Emissions	PM_{10} Average Annual Emissions	$PM_{2.5}$ Average Annual Emissions	CO Average Annual Emissions	SO_2 Average Annual Emissions	NO_X Average Annual Emissions	VOC Average Annual Emissions	Pb Average Annual Emissions
	tpy	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**
Future Potential Emissions for New	122,123.78	44.41	41.63	30.76	78.50	0.59	72.93	53.97	0.0005
PSD Significant Emission Rate [(1)]	75,000	25	15	10	100	40	40	40	0.6
Over PSD Threshold?	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**	**No**

Notes:
1. Emission rates for PSD Significant threshold per definition of "Significant" in AAC 335-3-14-.04(2)(w).

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates for Contact Cooling Tower

Inputs:

Description	Value	Units
Circulating Water Flow Rate(1)	15,170	gpm
TDS(1)	2,000	ppm
Drift Rate(2)	0.0005%	-
Operating Hours	8,760	hr/yr

Diameter of Droplets (micron)(3) Dd	% of Particulate Emissions(3)	Linear Interpolation Factors(3)
10	0.0%	0.0002
20	0.196%	0.00003
30	0.226%	0.0003
40	0.514%	0.0013
50	1.816%	0.0039
60	5.702%	0.0156
70	21.348%	0.0142
90	49.812%	0.0103
110	70.509%	0.0058
130	82.023%	0.0030
150	88.012%	0.0010
180	91.032%	0.0005
210	92.468%	0.0005
240	94.091%	0.0002
270	94.689%	0.0005
300	96.288%	0.0001
350	97.011%	0.0003
400	98.340%	0.0001
450	99.071%	0.000
500	99.071%	0.0001
600	100.000%	

PM Distribution Analysis		Units
PM_{10} Droplet Size(4)	103.23	micron
$PM_{2.5}$ Droplet Size(4)	25.81	micron
PM_{10} % of Particulate Emissions(5)	63.5%	%
$PM_{2.5}$ % of Particulate Emissions(5)	0.21%	%

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
PM	0.08	0.33
PM	0.05	0.21
$PM_{2.5}$	0.0002	0.0007

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
PM (2)	0.05	0.21
$PM_{2.5}$(2)	0.0002	0.0007

Notes:

(1) Circulating Water Flow Rate obtained from AM based on vendor data provided March 1, 2024.

(2) Drift rate is based on high efficiency drift eliminator.

(3) Calculating Realistic PM10 Emissions from Cooling Towers (Joel Reisman and Gordon Frisbie)
https://www.energy.ca.gov/sitingcases//palomar/documents/applicants_files/Data_Request_Response/Air%20Quality/Attachment%204-1.pdf

(4) Droplet Size Equation = diameter / (((TDS/10^6) X 1 kg / 2.2 lb)^1/3)

(5) PM_{10} % of Particulate Emissions Example utilizes linear interpolation between 90 micron and 110 micron Diameter Droplets. Equation = 90 micron % of Particulate Emissions X (PM_{10} Droplet Size - 90 micron) X 90 micron Linear Interpolation Factor = 49.812% X (103.23 - 90) X 0.0103

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates for Emergency Engine 1

Inputs:

Description	Value	Units
Operating Rate	2,000	kWe
Operating Rate (assuming 75% efficiency converting kWm to kWe	2,667	kWm
Density of Distillate Oil[1]	7.05	lbs/gal
Heating Value of Distillate Oil[1]	140,000	Btu/gal
Sulfur Content of Diesel[2]	15	ppm
Conversion Factor[3]	7,000	Btu/hp-hr
Conversion Factor[1]	1.34	hp/kW
Hours of Operation	500	hr/yr

Criteria Pollutant Emission Factors[7]:

Pollutant	Value (g/kW-hr)	Value (lbs/kW-hr)
Filterable $PM_{10}/PM_{2.5}$ [4, 5]	0.20	0.00044
CO	3.5	0.00772
SO_2 [9]		0.00001
NO_X [6]	6.4	0.01411
Total VOC [6]	6.4	0.01411

		Value ($PM_{condensable}/PM_{10filterable}$ ratio)
Condensable PM[8]		0.023

HAP Emission Factors for Diesel Engines[10] :

Pollutant	Emission Factor	Unit
Benzene	0.000776	lb/MMBtu
Toluene	0.000281	lb/MMBtu
Xylenes	0.000193	lb/MMBtu
Propylene	0.00279	lb/MMBtu
Formaldehyde	0.0000789	lb/MMBtu
Acetaldehyde	0.0000252	lb/MMBtu
Acrolein	0.00000788	lb/MMBtu
Naphthalene	0.00013	lb/MMBtu
Total PAH	0.000212	lb/MMBtu

GHG Emission Factors for Diesel Engines [11]:

Pollutant	Emission Factor	Global Warming Potential [12]
	lb/MMBtu	
CO_2	163.05	1
CH_4	0.01	25
N_2O	0.001	298

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	1.18	0.29
Filterable $PM_{2.5}$	1.18	0.29
Condensable PM	0.03	0.007
CO	20.58	5.14
SO_2	0.04	0.009
NO_X	37.63	9.41
VOC	37.63	9.41
Benzene	0.0194	0.0049
Toluene	0.0070	0.0018
Xylenes	0.0048	0.0012
Propylene	0.0698	0.017
Formaldehyde	0.0020	0.0005
Acetaldehyde	0.0006	0.00016
Acrolein	0.0002	0.00005
Naphthalene	0.0033	0.00081
Total PAH	0.0053	0.0013
CO_2	4079	1020
CH_4	0.1654	0.04
N_2O	0.0331	0.01
CO_{2e}	4093	1023

Notes:
(1) Values are based on AP-42, Appendix A: Miscellaneous Data & Conversion Factors, dated September 1985.
(2) Per 40 CFR 60.4207(b), represents maximum sulfur content for nonroad diesel fuel, as specified in 40 CFR 80.510(b)(1)(i).
(3) Average break-specific fuel consumption (BSFC) is based on AP-42, Section 3.3, Gasoline and Diesel Industrial Engines, Table 3.3-1, footnote a. dated October 1996.

(4) It is conservatively assumed that all particulate matter is PM_{10}.
(5) $PM_{2.5}$ is conservatively assumed to be equal to PM_{10}.
(6) Emission factors based on the emission standard for Non-Methane Hydrocarbons (NMHC) + NOx. For purposes of determining potential emissions of NOx and Total VOC, the combined emission standard for NMHC + NOx is used for each pollutant in the absence of separate emission standards for NOx and VOC.

(7) Per 40 CFR Part 60 Subpart IIII *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* , criteria pollutant emissions factors are based on 40 CFR 89.112 Table 1.

(8) Condensable PM emission factor derived from EPA's PM calculator tool for SCC Code 20200107 (Diesel Industrial Engines/Reciprocating Exhaust).
(9) SO_2 Emission Factor = Average Brake-Specific Fuel Consumption (7000 Btu/hp-hr) / Heating Value Distillate Oil (140,000 Btu/gal) × Density Distillate Oil (7.05 lbs/gal) × Concentration of Sulfur (15 ppm) / 1,000,000 ×(64.1 lbs/lb-mol SO_2 / 32.1 lbs/lb-mol S) × 1.34hp/kW.
(10) HAP emission factors are based on AP-42, Section 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines, Table 3.4-3 - Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, dated October 1996.
(11) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.
(12) Global Warming Potentials (GWP) are based on 40 CFR 98, Table A-1.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates for Emergency Engine 2

Inputs:

Description	Value	Units
Operating Rate	250	kWe
Operating Rate (assuming 75% efficiency converting kWm to kWe	333	kWm
Density of Distillate Oil[1]	7.05	lbs/gal
Heating Value of Distillate Oil[1]	140,000	Btu/gal
Sulfur Content of Diesel[2]	15	ppm
Conversion Factor[3]	7,000	Btu/hp-hr
Conversion Factor[1]	1.34	hp/kW
Hours of Operation	500	hr/yr

Criteria Pollutant Emission Factors[7]:

Pollutant	Value (g/kW-hr)	Value (lbs/kW-hr)
Filterable $PM_{10}/PM_{2.5}$ [4, 5]	0.20	0.00044
CO	3.5	0.00772
SO_2 [9]		0.00001
NO_X [6]	4.00	0.00882
Total VOC [6]	4.00	0.00882

		Value ($PM_{condensable}/PM_{10filterable}$ ratio)
Condensable PM[8]		0.023

HAP Emission Factors for Diesel Engines[10] :

Pollutant	Emission Factor	Unit
Benzene	0.000933	lb/MMBtu
Toluene	0.000409	lb/MMBtu
Xylenes	0.000285	lb/MMBtu
Propylene	0.00258	lb/MMBtu
1,3-Butadiene	0.0000391	lb/MMBtu
Formaldehyde	0.00118	lb/MMBtu
Acetaldehyde	0.0007670	lb/MMBtu
Acrolein	0.0000925	lb/MMBtu
Naphthalene	0.0000848	lb/MMBtu
Total PAH	0.000168	lb/MMBtu

GHG Emission Factors for Diesel Engines [11]:

Pollutant	Emission Factor	Global Warming Potential [12]
	lb/MMBtu	
CO_2	163.05	1
CH_4	0.01	25
N_2O	0.001	298

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.15	0.04
Filterable $PM_{2.5}$	0.15	0.04
Condensable PM	0.003	0.0008
CO	2.57	0.64
SO_2	0.005	0.0012
NO_X	2.94	0.73
VOC	2.94	0.73
Benzene	0.0029	0.0007
Toluene	0.0013	0.00032
Xylenes	0.0009	0.00022
Propylene	0.0081	0.0020
1,3-Butadiene	0.0001	0.000031
Formaldehyde	0.0037	0.0009
Acetaldehyde	0.0024	0.00060
Acrolein	0.0003	0.00007
Naphthalene	0.0003	0.00007
Total PAH	0.0005	0.00013
CO_2	510	127
CH_4	0.0207	0.01
N_2O	0.0041	0.001
CO_{2e}	512	128

Notes:

(1) Values are based on AP-42, Appendix A: Miscellaneous Data & Conversion Factors, dated September 1985.
(2) Per 40 CFR 60.4207(b), represents maximum sulfur content for nonroad diesel fuel, as specified in 40 CFR 80.510(b)(1)(i).
(3) Average break-specific fuel consumption (BSFC) is based on AP-42, Section 3.3, Gasoline and Diesel Industrial Engines, Table 3.3-1, footnote a. dated October 1996.

(4) It is conservatively assumed that all particulate matter is PM_{10}.
(5) $PM_{2.5}$ is conservatively assumed to be equal to PM_{10}.
(6) Emission factors based on the emission standard for Non-Methane Hydrocarbons (NMHC) + NOx. For purposes of determining potential emissions of NOx and Total VOC, the combined emission standard for NMHC + NOx is used for each pollutant in the absence of separate emission standards for NOx and VOC.

(7) Per 40 CFR Part 60 Subpart IIII *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, criteria pollutant emissions factors are based on 40 CFR 89.112 Table 1.

(8) Condensable PM emission factor derived from EPA's PM calculator tool for SCC Code 20200107 (Diesel Industrial Engines/Reciprocating Exhaust).
(9) SO_2 Emission Factor = Average Brake-Specific Fuel Consumption (7000 Btu/hp-hr) / Heating Value Distillate Oil (140,000 Btu/gal) × Density Distillate Oil (7.05 lbs/gal) × Concentration of Sulfur (15 ppm) / 1,000,000 ×(64.1 lbs/lb-mol SO_2 / 32.1 lbs/lb-mol S) × 1.34hp/kW.
(10) HAP emission factors are based on AP-42, Section 3.3, Gasoline and Diesel Industrial Engines, Table 3.3-2 - Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, dated October 1996.
(11) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.
(12) Global Warming Potentials (GWP) are based on 40 CFR 98, Table A-1.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Pickling Line Scrubber

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate (1)	17,657	scfm
HCl Concentration(2)	6	ppmv
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Hydrochloric Acid	0.60	2.64
Total HAPs	0.60	2.64

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}	0.001	gr/dscf
Filterable $PM_{2.5}$(3)	0.96	$PM_{2.5}$/PM_{10} ratio
Condensable PM(4)	0.78	$PM_{condensable}$/$PM_{10\ filterable}$ ratio

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.20	0.87
Filterable $PM_{2.5}$	0.19	0.83
Condensable PM	0.15	0.68
Hydrochloric Acid	0.60	2.64

Notes:
(1) Stack Exhaust Flow Rate obtained from OEM technical gurantees (converted from Nm^3/hr)
(2) HCl concentration corresponds to the applicable limitation of 40 CFR 63 Subpart CCC.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates for Boiler 1

Inputs:

Description	Value	Units
Natural Gas Firing Rate (5)	45.50	MMBtu/hr
Natural Gas Heating Value	1,020	Btu/ft^3
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10} (3)	0.08	0.37
Filterable $PM_{2.5}$	0.08	0.37
Condensable PM	0.25	1.11
CO	3.37	14.75
SO_2	0.03	0.12
NO_X	1.64	7.17
VOC	0.25	1.07
Pb	2.230E-05	9.77E-05
Total HAPs	0.004	0.02

Emission Factors:

Pollutant(1)	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
CO(2)	0.074	lb/MMBtu
SO_2(2)	0.0006	lb/MMBtu
NO_X(2)	0.036	lb/MMBtu
VOC(2)	0.0054	lb/MMBtu
Pb	0.0005	lb/10^6 ft^3
Benzene	0.0021	lb/10^6 ft^3
Dichlorobenzene	0.0012	lb/10^6 ft^3
Formaldehyde	0.075	lb/10^6 ft^3
Hexane(6)	0.0046	lb/10^6 ft^3
Naphthalene	0.00061	lb/10^6 ft^3
Polycyclic Organic Matter	0.0000882	lb/10^6 ft^3
Toluene	0.0034	lb/10^6 ft^3
Arsenic	0.0002	lb/10^6 ft^3
Beryllium	0.000012	lb/10^6 ft^3
Cadmium	0.0011	lb/10^6 ft^3
Chromium	0.0014	lb/10^6 ft^3
Cobalt	0.000084	lb/10^6 ft^3
Manganese	0.00038	lb/10^6 ft^3
Mercury	0.00026	lb/10^6 ft^3
Nickel	0.0021	lb/10^6 ft^3
Selenium	0.000024	lb/10^6 ft^3
CO_2(3)	117	lb/MMBtu
CH_4(3)	0.0022	lb/MMBtu
N_2O(3)	0.00022	lb/MMBtu

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.08	0.37
Filterable $PM_{2.5}$	0.08	0.37
Condensable PM	0.25	1.11
CO	3.37	14.75
SO_2	0.03	0.12
NO_X	1.64	7.17
VOC	0.25	1.07
Pb	2.23E-05	9.77E-05
Benzene	9.37E-05	4.10E-04
Dichlorobenzene	5.35E-05	2.34E-04
Formaldehyde	3.35E-03	1.47E-02
Hexane	2.05E-04	8.99E-04
Naphthalene	2.72E-05	1.19E-04
Polycyclic Organic Matter	3.93E-06	1.72E-05
Toluene	1.52E-04	6.64E-04
Arsenic	8.92E-06	3.91E-05
Beryllium	5.35E-07	2.34E-06
Cadmium	4.91E-05	2.15E-04
Chromium	6.25E-05	2.74E-04
Cobalt	3.75E-06	1.64E-05
Manganese	1.70E-05	7.42E-05
Mercury	1.16E-05	5.08E-05
Nickel	9.37E-05	4.10E-04
Selenium	1.07E-06	4.69E-06
CO_2	5,322.466	23,312.401
CH_4	0.100	0.439
N_2O	0.010	0.044
CO_2e (4)	5,327.963	23,336.478

Notes:

(1) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998) unless otherwise noted. As per footnote "c" to AP-42 Table 1.4-2, all PM is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM (Filterable) emission factor was used to represent filterable $PM_{2.5}$.

(2) Emission factors based on vendor data

(3) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.

(4) CH_4, N_2O, and CO_2 emissions are included as Carbon Dioxide Equivalent (CO_2e) emissions and weighted based on the following Global Warming Potentials (GWP): 1 - CO_2, 25 - CH_4, 298 - N_2O which can be found in 40 CFR 98, Table A-1.

(5) Obtained from engineering

(6) Hexane emission factor from South Coast AQMD, "Reporting Procedures for AB2588 Facilities Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-1: Default EF for Natural Gas Combustion (lb/mmscf), SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)", December 2016.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates for Boiler 2

Inputs:

Description	Value	Units
Natural Gas Firing Rate (5)	45.50	MMBtu/hr
Natural Gas Heating Value	1,020	Btu/ft^3
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10} (3)	0.08	0.37
Filterable $PM_{2.5}$	0.08	0.37
Condensable PM	0.25	1.11
CO	3.37	14.75
SO_2	0.03	0.12
NO_X	1.64	7.17
VOC	0.25	1.07
Pb	2.230E-05	9.77E-05
Total HAPs	0.004	0.02

Emission Factors:

Pollutant(1)	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
CO(2)	0.074	lb/MMBtu
SO_2 (2)	0.0006	lb/MMBtu
NO_X (2)	0.036	lb/MMBtu
VOC(2)	0.0054	lb/MMBtu
Pb	0.0005	lb/10^6 ft^3
Benzene	0.0021	lb/10^6 ft^3
Dichlorobenzene	0.0012	lb/10^6 ft^3
Formaldehyde	0.075	lb/10^6 ft^3
Hexane(6)	0.0046	lb/10^6 ft^3
Naphthalene	0.00061	lb/10^6 ft^3
Polycyclic Organic Matter	0.0000882	lb/10^6 ft^3
Toluene	0.0034	lb/10^6 ft^3
Arsenic	0.0002	lb/10^6 ft^3
Beryllium	0.000012	lb/10^6 ft^3
Cadmium	0.0011	lb/10^6 ft^3
Chromium	0.0014	lb/10^6 ft^3
Cobalt	0.000084	lb/10^6 ft^3
Manganese	0.00038	lb/10^6 ft^3
Mercury	0.00026	lb/10^6 ft^3
Nickel	0.0021	lb/10^6 ft^3
Selenium	0.000024	lb/10^6 ft^3
CO_2 (3)	117	lb/MMBtu
CH_4 (3)	0.0022	lb/MMBtu
N_2O (3)	0.00022	lb/MMBtu

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.08	0.37
Filterable $PM_{2.5}$	0.08	0.37
Condensable PM	0.25	1.11
CO	3.37	14.75
SO_2	0.03	0.12
NO_X	1.64	7.17
VOC	0.25	1.07
Pb	2.23E-05	9.77E-05
Benzene	9.37E-05	4.10E-04
Dichlorobenzene	5.35E-05	2.34E-04
Formaldehyde	3.35E-03	1.47E-02
Hexane	2.05E-04	8.99E-04
Naphthalene	2.72E-05	1.19E-04
Polycyclic Organic Matter	3.93E-06	1.72E-05
Toluene	1.52E-04	6.64E-04
Arsenic	8.92E-06	3.91E-05
Beryllium	5.35E-07	2.34E-06
Cadmium	4.91E-05	2.15E-04
Chromium	6.25E-05	2.74E-04
Cobalt	3.75E-06	1.64E-05
Manganese	1.70E-05	7.42E-05
Mercury	1.16E-05	5.08E-05
Nickel	9.37E-05	4.10E-04
Selenium	1.07E-06	4.69E-06
CO_2	5,322.466	23,312.401
CH_4	0.100	0.439
N_2O	0.010	0.044
CO_2e (4)	5,327.963	23,336.478

Notes:

(1) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998) unless otherwise noted. As per footnote "c" to AP-42 Table 1.4-2, all PM is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM (Filterable) emission factor was used to represent filterable $PM_{2.5}$.

(2) Emission factors based on vendor data

(3) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.

(4) CH_4, N_2O, and CO_2 emissions are included as Carbon Dioxide Equivalent (CO_2e) emissions and weighted based on the following Global Warming Potentials (GWP): 1 - CO_2, 25 - CH_4, 298 - N_2O which can be found in 40 CFR 98, Table A-1.

(5) Obtained from engineering

(6) Hexane emission factor from South Coast AQMD, “Reporting Procedures for AB2588 Facilities Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-1: Default EF for Natural Gas Combustion (lb/mmscf), SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)”, December 2016.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates for Annealing Furnace

Inputs:

Description	Value	Units
Natural Gas Firing Rate[(1)]	93.65	MMBtu/hr
Exhaust Gas Flow Rate [(1)]	136,848	m3/hr
Exhaust Gas Flow Rate [(1)]	4,832,734	scfh
Natural Gas Heating Value	1,020	Btu/ft^3
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Average Hourly Emissions	Annual Emissions
	lbs_{AVG}/hr	tpy
Filterable PM/PM_{10}	0.18	0.78
Filterable $PM_{2.5}$	0.18	0.78
Condensable PM	0.52	2.30
CO	7.71	33.78
SO_2	0.054	0.24
NO_X	4.68	20.51
VOC	0.50	2.21
Pb	4.59E-05	2.01E-04
Total HAPs	0.008	3.72E-02

Emission Factors:

Pollutant[(2)]	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
CO	0.082	lb/MMBtu
SO_2	0.0006	lb/MMBtu
NO_X[(3)]	0.050	lb/MMBtu
Total VOC	0.0054	lb/MMBtu
Pb	0.0005	lb/10^6 ft^3
Benzene	0.0021	lb/10^6 ft^3
Dichlorobenzene	0.0012	lb/10^6 ft^3
Formaldehyde	0.075	lb/10^6 ft^3
Hexane[(6)]	0.0046	lb/10^6 ft^3
Naphthalene	0.00061	lb/10^6 ft^3
Polycyclic Organic Matter	0.0000882	lb/10^6 ft^3
Toluene	0.0034	lb/10^6 ft^3
Arsenic	0.0002	lb/10^6 ft^3
Beryllium	0.000012	lb/10^6 ft^3
Cadmium	0.0011	lb/10^6 ft^3
Chromium	0.0014	lb/10^6 ft^3
Cobalt	0.000084	lb/10^6 ft^3
Manganese	0.00038	lb/10^6 ft^3
Mercury	0.00026	lb/10^6 ft^3
Nickel	0.0021	lb/10^6 ft^3
Selenium	0.000024	lb/10^6 ft^3
Ammonia	5	ppmv
CO_2[(4)]	117	lb/MMBtu
CH_4[(4)]	0.0022	lb/MMBtu
N_2O[(4)]	0.00022	lb/MMBtu

Emission Calculations:

Pollutant	Average Hourly Emissions	Annual Emissions
	lbs_{max}/hr	tpy
Filterable PM/PM_{10}	0.18	0.78
Filterable $PM_{2.5}$	0.18	0.78
Condensable PM	0.52	2.30
CO	7.71	33.78
SO_2	0.054	0.24
NO_X	4.68	20.51
VOC	0.50	2.21
Pb	4.59E-05	2.01E-04
Benzene	1.93E-04	8.45E-04
Dichlorobenzene	1.10E-04	4.83E-04
Formaldehyde	6.89E-03	3.02E-02
Hexane	4.22E-04	0.0018
Naphthalene	5.60E-05	2.45E-04
Polycyclic Organic Matter	8.10E-06	3.55E-05
Toluene	3.12E-04	1.37E-03
Arsenic	1.84E-05	8.04E-05
Beryllium	1.10E-06	4.83E-06
Cadmium	1.01E-04	4.42E-04
Chromium	1.29E-04	5.63E-04
Cobalt	7.71E-06	3.38E-05
Manganese	3.49E-05	1.53E-04
Mercury	2.39E-05	1.05E-04
Nickel	1.93E-04	8.45E-04
Selenium	2.20E-06	9.65E-06
Ammonia	1.07	4.68
CO_2	10,955	47,985
CH_4	0.21	0.90
N_2O	0.02	0.09
CO_2e [(5)]	10,967	48,034

Notes:
(1) Natural gas firing rate obtained from vendor
(2) Criteria pollutant and HAP emission factors, unless noted otherwise, obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998).
(3) Emission factors obtained from vendor
(4) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.
(5) CH_4, N_2O, and CO_2 emissions are included as Carbon Dioxide Equivalent (CO_2e) emissions and weighted based on the following Global Warming Potentials (GWP): 1 - CO_2, 25 - CH_4, 298 - N_2O which can be found in 40 CFR 98, Table A-1.
(6) Hexane emission factor from South Coast AQMD, "Reporting Procedures for AB2588 Facilities Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-1: Default EF for Natural Gas Combustion (lb/mmscf), SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)", December 2016.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Shot Blaster Baghouse

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate(1)	26,486	dscfm
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM	0.67	2.955
Filterable PM_{10}	0.10	0.422
Filterable $PM_{2.5}$	0.01	0.042

Emission Factors:

Pollutant	Value	Units
Total PM(2)	0.0030	gr/dscf
Filterable PM_{10}(3)	0.0004	gr/dscf
Filterable $PM_{2.5}$(3)	0.00004	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM	0.67	2.95
Filterable PM_{10}	0.10	0.42
Filterable $PM_{2.5}$	0.01	0.04

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor.
(2) Emission factors obtained from vendor
(3) Filterable PM10 and PM2.5 speciated emissions derived from AP-42 Chapter 13.2.6 "Abrasive Blasting" (1997)

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Spray Roaster

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate(1)	1,883	scfm
Natural Gas Firing Rate(1)	13.0	MMBtu/hr
Annual Operating Time	8,760	hr/yr
Natural Gas Higher Heating Value	1,020	Btu/ft^3

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tons/year
Total PM_{10}	0.07	0.31
Total $PM_{2.5}$	0.07	0.31
SO_2	0.01	0.03
VOC	0.07	0.31
CO	1.07	4.68
NO_x	0.71	3.09
HCl	0.13	0.56
Cl_2	0.12	0.55

Emission Factors:

Pollutant	Value	Units
Total PM/PM_{10} (2)	0.07	lb/hr
Total $PM_{2.5}$ (2)	0.07	lb/hr
SO_2 (4)	0.0006	lb/MMBtu
VOC (4)	0.0054	lb/MMBtu
CO (4)	0.082	lb/MMBtu
NO_x(2)	0.71	lb/hr
HCl Concentration(5)	12	ppmv dry
Cl_2 Concentration(5)	6	ppmv dry
Formaldehyde(6)	0.075	lb/10^6 ft^3
Hexane(9)	0.0046	lb/10^6 ft^3
Toluene(6)	0.0034	lb/10^6 ft^3
CO_2(7)	117	lb/MMBtu
CH_4(7)	0.0022	lb/MMBtu
N_2O(7)	0.00022	lb/MMBtu

Emission Calculations:

Pollutant	Hourly Emissions per Roaster lbs/hr	Total Annual Emissions tons/year
Total PM_{10}	0.07	0.31
Total $PM_{2.5}$	0.07	0.31
SO_2	0.01	0.03
VOC	0.07	0.31
CO	1.07	4.68
NO_x	0.71	3.09
HCl	0.13	0.56
Cl_2	0.12	0.55
Formaldehyde	0.00	0.00
Hexane	0.00	0.00
Toluene	0.00004	0.0002
CO_2	1516.91	6644.06
CH_4	0.03	0.13
N_2O	0.003	0.01
CO_2e (8)	1518.47	6650.92

Notes:
(1) Stack exhaust rate and firing rate provided by vendor
(2) Emission rates provided by vendor. Total PM (including filterable and condensable) converted from 10 mg/m^3 to lb/hr. Assumed $PM_{2.5}$ = $PM_{10.}$ NOx converted from 100 mg/m3 to lb/hr.
(3) Condensable PM emission factor derived from EPA's PM calculator tool for SCC Code 30300999 (Steel Manufacturing/Other Not Classified).
(4) Emission factors for SO2, CO and VOC obtained from AP 42 Chapter 1.4 Table 1.4-1 and Table 1.4-2.
(5) Concentration conservatively based on 40 CFR Part 63 Subpart CCC limit/Permit Limit.
(6) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998)
(7) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.
(8) CH_4, N_2O, and CO_2 emissions are included as Carbon Dioxide Equivalent (CO_2e) emissions and weighted based on the following Global Warming Potentials (GWP): 1 - CO_2, 25 - CH_4, 298 - N_2O which can be found in 40 CFR 98, Table A-1.
(9) Hexane emission factor from South Coast AQMD, "Reporting Procedures for AB2588 Facilities Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-1: Default EF for Natural Gas Combustion (lb/mmscf), SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)", December 2016.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Annealing and Coating Line Cleaning Section 1

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate[1]	14,714	dscfm
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.378	1.657
Filterable $PM_{2.5}$	0.378	1.657

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}[2]	0.0030	gr/dscf
Filterable $PM_{2.5}$[2]	0.0030	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.38	1.66
Filterable $PM_{2.5}$	0.38	1.66

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor
(2) Emission factors obtained from vendor

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Annealing and Coating Line Cleaning Section 2

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate[1]	14,714	dscfm
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.378	1.657
Filterable $PM_{2.5}$	0.378	1.657

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}[2]	0.0030	gr/dscf
Filterable $PM_{2.5}$[2]	0.0030	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.38	1.66
Filterable $PM_{2.5}$	0.38	1.66

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor
(2) Emission factors obtained from vendor

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Curing Oven 1 + Regenerative Thermal Oxidizer 1

Inputs:

Description	Value	Units
Natural Gas Firing Rate - Oven (3)	11.88	MMBtu/hr
Natural Gas Firing Rate - RTO (3)	2	MMBtu/hr
Natural Gas Heating Value	1,020	Btu/ft^3
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.03	0.11
Filterable $PM_{2.5}$	0.03	0.11
Condensable PM	0.08	0.34
SO_2	0.01	0.04
CO	0.54	2.38
NO_X	1.15	5.06
VOC	2.06	9.03
Pb	6.804E-06	2.98E-05
Total HAPs	0.001	0.01

Oven Emission Factors:

Pollutant(2)	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
SO_2(2)	0.0006	lb/MMBtu
CO(3)	0.039	lb/MMBtu
NO_X(3)	0.077	lb/MMBtu
VOC	0.0054	lb/MMBtu
VOC(3)	205	lb/hr

RTO Emission Factors:

Pollutant(2)	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
SO_2(2)	0.0006	lb/MMBtu
CO(3)	0.04	lb/MMBtu
NO_X(3)	0.12	lb/MMBtu
VOC Reduction for Curing Oven Emissions (4)	99%	
VOC	0.0054	lb/MMBtu

HAP and GHG Emission Factors(2):

Pb	0.0005	lb/10^6 ft^3
Benzene	0.0021	lb/10^6 ft^3
Dichlorobenzene	0.0012	lb/10^6 ft^3
Formaldehyde	0.075	lb/10^6 ft^3
Hexane(7)	0.0046	lb/10^6 ft^3
Naphthalene	0.00061	lb/10^6 ft^3
Polycyclic Organic Matter	0.0000882	lb/10^6 ft^3
Toluene	0.0034	lb/10^6 ft^3
Arsenic	0.0002	lb/10^6 ft^3
Beryllium	0.000012	lb/10^6 ft^3
Cadmium	0.0011	lb/10^6 ft^3
Chromium	0.0014	lb/10^6 ft^3
Cobalt	0.000084	lb/10^6 ft^3
Manganese	0.00038	lb/10^6 ft^3
Mercury	0.00026	lb/10^6 ft^3
Nickel	0.0021	lb/10^6 ft^3
Selenium	0.000024	lb/10^6 ft^3
CO_2(5)	117	lb/MMBtu
CH_4(5)	0.0022	lb/MMBtu
N_2O(5)	0.00022	lb/MMBtu

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.03	0.11
Filterable $PM_{2.5}$	0.03	0.11
Condensable PM	0.08	0.34
SO_2	0.01	0.04
CO	0.54	2.38
NO_X	1.15	5.06
VOC - Oven+RTO	2.06	9.03
Pb	6.80E-06	2.98E-05
Benzene	2.86E-05	1.25E-04
Dichlorobenzene	1.63E-05	7.15E-05
Formaldehyde	1.02E-03	4.47E-03
Hexane	6.26E-05	2.74E-04
Naphthalene	8.30E-06	3.64E-05
Polycyclic Organic Matter	1.20E-06	5.26E-06
Toluene	4.63E-05	2.03E-04
Arsenic	2.72E-06	1.19E-05
Beryllium	1.63E-07	7.15E-07
Cadmium	1.50E-05	6.56E-05
Chromium	1.91E-05	8.34E-05
Cobalt	1.14E-06	5.01E-06
Manganese	5.17E-06	2.26E-05
Mercury	3.54E-06	1.55E-05
Nickel	2.86E-05	1.25E-04
Selenium	3.27E-07	1.43E-06
CO_2 (Natural Gas Combustion)	1,623.645	7,111.563
CO_2 (Converting Additional VOC to CO_2)(8)	613.773	2,688.324
CH_4	0.031	0.134
N_2O	0.003	0.013
CO_2e(6)	2,239.094	9,807.233

Notes:

(1) Emissions from the Curing Oven directly route to the Regenerative Thermal Oxidizer (RTO). There will be 1 stack for the Curing Oven + RTO Emissions

(2) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998) unless otherwise noted. As per footnote "c" to AP-42 Table 1.4-2, all PM is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM (Filterable) emission factor was used to represent filterable $PM_{2.5}$.

(2) Emission factors based on AP-42, Section 1.4, Natural Gas Combustion (July 1998). As per footote "a" to AP-42 Table 1.4-2, divide by 1020 to convert from lb/10^6 scf to lb/MMBtu.

(3) Emission factor and firing rates obtained from vendor data provided
(4) VOC destruction efficiency provided by vendor
(5) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.

(6) CH_4, N_2O, and CO_2 emissions are included as Carbon Dioxide Equivalent (CO_2e) emissions and weighted based on the following Global Warming Potentials (GWP): 1 - CO_2, 25 - CH_4, 298 - N_2O which can be found in 40 CFR 98, Table A-1.

(7) Hexane emission factor from South Coast AQMD, “Reporting Procedures for AB2588 Facilities Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-1: Default EF for Natural Gas Combustion (lb/mmscf), SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)”, December 2016.
(8) Conservatively assumes VOC as propane and full conversion to CO2 for VOC contributions excluding natural gas combustion.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Curing Oven 2 + Regenerative Thermal Oxidizer 2

Inputs:

Description	Value	Units
Natural Gas Firing Rate - Oven (3)	11.88	MMBtu/hr
Natural Gas Firing Rate - RTO (3)	2	MMBtu/hr
Natural Gas Heating Value	1,020	Btu/ft^3
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.03	0.11
Filterable $PM_{2.5}$	0.03	0.11
Condensable PM	0.08	0.34
SO_2	0.01	0.04
CO	0.54	2.38
NO_X	1.15	5.06
VOC	2.06	9.03
Pb	6.804E-06	2.98E-05
Total HAPs	0.001	0.01

Oven Emission Factors:

Pollutant(2)	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
SO_2 (2)	0.0006	lb/MMBtu
CO(3)	0.039	lb/MMBtu
NO_X (3)	0.077	lb/MMBtu
VOC	0.0054	lb/MMBtu
VOC(3)	205	lb/hr

RTO Emission Factors:

Pollutant(2)	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
SO_2 (2)	0.0006	lb/MMBtu
CO(3)	0.04	lb/MMBtu
NO_X (3)	0.12	lb/MMBtu
VOC Reduction for Curing Oven Emissions (4)	99%	
VOC	0.0054	lb/MMBtu

HAP and GHG Emission Factors(2):

Pb	0.0005	lb/10^6 ft^3
Benzene	0.0021	lb/10^6 ft^3
Dichlorobenzene	0.0012	lb/10^6 ft^3
Formaldehyde	0.075	lb/10^6 ft^3
Hexane(7)	0.0046	lb/10^6 ft^3
Naphthalene	0.00061	lb/10^6 ft^3
Polycyclic Organic Matter	0.0000882	lb/10^6 ft^3
Toluene	0.0034	lb/10^6 ft^3
Arsenic	0.0002	lb/10^6 ft^3
Beryllium	0.000012	lb/10^6 ft^3
Cadmium	0.0011	lb/10^6 ft^3
Chromium	0.0014	lb/10^6 ft^3
Cobalt	0.000084	lb/10^6 ft^3
Manganese	0.00038	lb/10^6 ft^3
Mercury	0.00026	lb/10^6 ft^3
Nickel	0.0021	lb/10^6 ft^3
Selenium	0.000024	lb/10^6 ft^3
CO_2 (5)	117	lb/MMBtu
CH_4 (5)	0.0022	lb/MMBtu
N_2O (5)	0.00022	lb/MMBtu

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.03	0.11
Filterable $PM_{2.5}$	0.03	0.11
Condensable PM	0.08	0.34
SO_2	0.01	0.04
CO	0.54	2.38
NO_X	1.15	5.06
VOC - Oven+RTO	2.06	9.03
Pb	6.80E-06	2.98E-05
Benzene	2.86E-05	1.25E-04
Dichlorobenzene	1.63E-05	7.15E-05
Formaldehyde	1.02E-03	4.47E-03
Hexane	6.26E-05	2.74E-04
Naphthalene	8.30E-06	3.64E-05
Polycyclic Organic Matter	1.20E-06	5.26E-06
Toluene	4.63E-05	2.03E-04
Arsenic	2.72E-06	1.19E-05
Beryllium	1.63E-07	7.15E-07
Cadmium	1.50E-05	6.56E-05
Chromium	1.91E-05	8.34E-05
Cobalt	1.14E-06	5.01E-06
Manganese	5.17E-06	2.26E-05
Mercury	3.54E-06	1.55E-05
Nickel	2.86E-05	1.25E-04
Selenium	3.27E-07	1.43E-06
CO_2 (Natural Gas Combustion)	1,623.645	7,111.563
CO_2 (Converting Additional VOC to CO_2)(8)	613.773	2,688.324
CH_4	0.031	0.134
N_2O	0.003	0.013
CO_2e (6)	2,239.094	9,807.233

Notes:

(1) Emissions from the Curing Oven directly route to the Regenerative Thermal Oxidizer (RTO). There will be 1 stack for the Curing Oven + RTO Emissions

(2) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998) unless otherwise noted. As per footnote "c" to AP-42 Table 1.4-2, all PM is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM (Filterable) emission factor was used to represent filterable $PM_{2.5}$.

(2) Emission factors based on AP-42, Section 1.4, Natural Gas Combustion (July 1998). As per footote "a" to AP-42 Table 1.4-2, divide by 1020 to convert from lb/10^6 scf to lb/MMBtu.

(3) Emission factor and firing rates obtained from vendor data provided
(4) VOC destruction efficiency provided by vendor
(5) GHG emission factors are from 40 CFR 98 Subpart C Tables C-1 and C-2. Values are converted from kg/MMBtu to lb/MMBtu.

(6) CH_4, N_2O, and CO_2 emissions are included as Carbon Dioxide Equivalent (CO_2e) emissions and weighted based on the following Global Warming Potentials (GWP): 1 - CO_2, 25 - CH_4, 298 - N_2O which can be found in 40 CFR 98, Table A-1.

(7) Hexane emission factor from South Coast AQMD, "Reporting Procedures for AB2588 Facilities Reporting their Quadrennial Air Toxics Emissions Inventory, Table B-1: Default EF for Natural Gas Combustion (lb/mmscf), SOURCE: External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)", December 2016.

(8) Conservatively assumes VOC as propane and full conversion to CO2 for VOC contributions excluding natural gas combustion.

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Cold Rolling Mill 1

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate(1)	105,944	ACFM
Stack Exhaust Flow Rate(1)	102,823	dscfm
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	2.291	10.04
Filterable $PM_{2.5}$	1.489	6.52

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}(2)	0.0026	gr/dscf
$PM_{2.5}$ Speciation(2)	65%	%

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	2.29	10.04
Filterable $PM_{2.5}$	1.49	6.52

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor
(2) Emission factors obtained from vendor

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Cold Rolling Mill 2

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate(1)	105,944	ACFM
Stack Exhaust Flow Rate(1)	102,823	dscfm
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	2.291	10.04
Filterable $PM_{2.5}$	1.489	6.52

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}(2)	0.0026	gr/dscf
$PM_{2.5}$ Speciation(2)	65%	%

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	2.29	10.04
Filterable $PM_{2.5}$	1.49	6.52

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor
(2) Emission factors obtained from vendor

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Iron Oxide Bins w/ Bagfilters

Inputs:		
Description	**Value**	**Units**
Maximum Normal Stack Exhaust Gas Wet Flow Rate (at 0 Deg C)(1)	5,400	Nm^3/hr wet at 0 Deg C
Moisture Content in Exhaust Gas (Minimum)(1)	3%	volume percent
Corrected (Dry Standard) Maximum Stack Gas Exhaust Flow Rate(1)	3,309	dscfm at 68 Deg F
Annual Operating Time	8,760	hr/yr

Emission Factors:

Pollutant	**Value**	**Units**
Filterable PM/PM_{10} (1)	15.0	mg/Nm^3 dry at 0 Deg C
Filterable PM/PM_{10}(1)	0.0061	gr/dscf
Filterable $PM_{2.5}$(2)	0.94	$PM_{2.5}/PM_{10}$ ratio
Condensable PM(3)	0.78	$PM_{condensable}/PM_{10\ filterable}$ ratio

Emission Calculations:(1)

Pollutant	**Hourly Emissions**	**Annual Emissions**
	lbs/hr	**tpy**
Filterable PM/PM_{10}	0.17	0.76
Filterable $PM_{2.5}$	0.16	0.72
Condensable PM	0.14	0.59
Total PM_{10}	**0.31**	**1.35**
Total $PM_{2.5}$	**0.30**	**1.31**

Notes:
(1) Design parameters similar to existing oxide filter system at AM/NS Calvert
(2) $PM_{2.5}$ emission factor derived from EPA's PM calculator tool for SCC Code 30300999 (Steel Manufacturing/Other Not Classified), with a primary control device code of 127 (Fabric Filter)
(3) Condensable PM emission factor derived from EPA's PM calculator tool for SCC Code 30300999 (Steel Manufacturing/Other Not Classified).

ArcelorMittal
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PSD Permit Application for NOES Project
Emissions Estimates for Tank Farm Scrubber

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate [(5)]	13,514	dscfm
HCl Concentration[(1)]	12	ppm
Cl_2 Concentration[(1)]	6	ppm
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.12	0.51
Filterable $PM_{2.5}$	0.11	0.49
Condensable PM	0.09	0.40
Hydrochloric Acid	0.921	4.04
Cl_2	0.896	3.92
Total HAPs	1.817	7.96

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}[(2)]	0.001	gr/dscf
Filterable $PM_{2.5}$[(3)]	0.96	$PM_{2.5}/PM_{10}$ ratio
Condensable PM[(4)]	0.78	$PM_{condensable}/PM_{10\ filterable}$ ratio

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.12	0.51
Filterable $PM_{2.5}$	0.11	0.49
Condensable PM	0.09	0.40
Hydrochloric Acid	0.92	4.04
Chlorine	0.90	3.92

Notes:
(1) Concentrations correspond to the applicable limitations of 40 CFR 63 Subpart CCC.
(2) Filterable PM/PM_{10} emission factor based on vendor information.
(3) Filterable $PM_{2.5}$ emission factor derived from EPA's PM calculator tool for SCC Code 30300999 (Steel Manufacturing/Other Not Classified), with a primary control device code of 141 (Wet Scrubber).
(4) Condensable PM emission factor derived from EPA's PM calculator tool for SCC Code 30300999 (Steel Manufacturing/Other Not Classified).
(5) Based on vendor information

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PSD Permit Application for NOES Project
Emissions Estimates ACL Cooling Section 1

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate[(1)]	165,575	Nm3/hr
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.37	1.60
Filterable $PM_{2.5}$	0.37	1.60
VOC	2.41	10.55

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}[(2)]	1.0	mg/Nm^3
Filterable $PM_{2.5}$[(2)]	1.0	mg/Nm^3
VOC[(2)]	6.6	mg/Nm^3

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.37	1.60
Filterable $PM_{2.5}$	0.37	1.60
VOC	2.4	10.55

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor
(2) Emission factors obtained from vendor

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates ACL Cooling Section 2

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate(1)	165,575	Nm3/hr
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.37	1.60
Filterable $PM_{2.5}$	0.37	1.60
VOC	2.41	10.55

Emission Factors:

Pollutant	Value	Units
Filterable PM/PM_{10}(2)	1.0	mg/Nm^3
Filterable $PM_{2.5}$(2)	1.0	mg/Nm^3
VOC(2)	6.6	mg/Nm^3

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.37	1.60
Filterable $PM_{2.5}$	0.37	1.60
VOC	2.4	10.55

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor
(2) Emission factors obtained from vendor

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Quenching - ACL 1

Inputs:

Description	Value	Units
Makeup Water Flow Rate[1]	13.2	gpm
TDS[2]	900	ppm
Hours of Operation	8,760	hr/yr

Diameter of Droplets (micron)[3] Dd	% of Particulate Emissions[3]	Linear Interpolation Factors[3]
10	0.0%	0.0002
20	0.196%	0.00003
30	0.226%	0.0003
40	0.514%	0.0013
50	1.816%	0.0039
60	5.702%	0.0156
70	21.348%	0.0142
90	49.812%	0.0103
110	70.509%	0.0058
130	82.023%	0.0030
150	88.012%	0.0010
180	91.032%	0.0005
210	92.468%	0.0005
240	94.091%	0.0002
270	94.689%	0.0005
300	96.288%	0.0001
350	97.011%	0.0003
400	98.340%	0.0001
450	99.071%	0.000
500	99.071%	0.0001
600	100.000%	

PM Distribution Analysis		Units
PM_{10} Droplet Size[4]	134.71	micron
$PM_{2.5}$ Droplet Size[4]	33.68	micron
PM_{10} % of Particulate Emissions[5]	88.5%	%
$PM_{2.5}$ % of Particulate Emissions[5]	0.33%	%

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Uncontrolled PM	5.95	26.05
Control Efficiency	98%	
PM_{10}	0.12	0.52
PM	0.11	0.46
$PM_{2.5}$	0.0004	0.002

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
PM [2]	0.11	0.46
$PM_{2.5}$[2]	0.0004	0.002

Notes:
(1) Makeup Water Flow Rate obtained from AM based on vendor data provided October 9, 2024.
(2) Total dissolved solids value provided by AM on October 7, 2024
(3) Calculating Realistic PM10 Emissions from Cooling Towers (Joel Reisman and Gordon Frisbie) https://www.energy.ca.gov/sitingcases//palomar/documents/applicants_files/Data_Request_Response/Air%20Quality/Attachment%204-1.pdf
(4) Droplet Size Equation = diameter / (((TDS/10^6) X 1 kg / 2.2 lb)^1/3)
(5) PM_{10} % of Particulate Emissions Example utilizes linear interpolation between 130 micron and 150 micron Diameter Droplets. Equation = 150 micron % of Particulate Emissions X (PM_{10} Droplet Size - 130 micron) X 150 micron Linear Interpolation Factor = 88.012% X (134.71 - 130) X 0.0010

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Quenching - ACL 2

Inputs:

Description	Value	Units
Makeup Water Flow Rate(1)	13.2	gpm
TDS(2)	900	ppm
Hours of Operation	8,760	hr/yr

Diameter of Droplets (micron)(3) Dd	% of Particulate Emissions(3)	Linear Interpolation Factors(3)
10	0.0%	0.0002
20	0.196%	0.00003
30	0.226%	0.0003
40	0.514%	0.0013
50	1.816%	0.0039
60	5.702%	0.0156
70	21.348%	0.0142
90	49.812%	0.0103
110	70.509%	0.0058
130	82.023%	0.0030
150	88.012%	0.0010
180	91.032%	0.0005
210	92.468%	0.0005
240	94.091%	0.0002
270	94.689%	0.0005
300	96.288%	0.0001
350	97.011%	0.0003
400	98.340%	0.0001
450	99.071%	0.000
500	99.071%	0.0001
600	100.000%	

PM Distribution Analysis		Units
PM_{10} Droplet Size(4)	134.71	micron
$PM_{2.5}$ Droplet Size(4)	33.68	micron
PM_{10} % of Particulate Emissions(5)	88.5%	%
$PM_{2.5}$ % of Particulate Emissions(5)	0.33%	%

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Uncontrolled PM	5.95	26.05
Control Efficiency	98%	
PM_{10}	0.12	0.52
PM	0.11	0.46
$PM_{2.5}$	0.0004	0.002

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
PM (2)	0.11	0.46
$PM_{2.5}$(2)	0.0004	0.002

Notes:
(1) Makeup Water Flow Rate obtained from AM based on vendor data provided October 9, 2024.
(2) Total dissolved solids value provided by AM on October 7, 2024
(3) Calculating Realistic PM10 Emissions from Cooling Towers (Joel Reisman and Gordon Frisbie) https://www.energy.ca.gov/sitingcases//palomar/documents/applicants_files/Data_Request_Response/Air%20Quality/Attachment%204-1.pdf
(4) Droplet Size Equation = diameter / (((TDS/10^6) X 1 kg / 2.2 lb)^1/3)
(5) PM_{10} % of Particulate Emissions Example utilizes linear interpolation between 130 micron and 150 micron Diameter Droplets. Equation = 150 micron % of Particulate Emissions X (PM_{10} Droplet Size - 130 micron) X 150 micron Linear Interpolation Factor = 88.012% X (134.71 - 130) X 0.0010

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Hydrogen Flare/Purge ACL 1

Inputs:

Description	Value	Units
Hydrogen Net Heating Value [1]	269	Btu/scf
Purge Flow Rates		
IH1/IH2 Flow Rate [2]	360	m^3/hr
IH2/EHS Flow Rate [2]	600	m^3/hr
RTC/RJC Flow Rate [2]	600	m^3/hr
Entry Seal Flow Rate [2]	600	m^3/hr
Exit Seal Flow Rate [2]	600	m^3/hr
Number of purges [3]	100	purges/yr
Duration of purge [2]	3	hr
Operating Hours	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
NOx IH1/IH2	0.22	0.96
NOx IH2/EHS	0.37	1.60
NOx RTC/RJC	0.37	1.60
NOx Entry Seal	0.37	1.60
NOx Exit Seal	0.37	1.60

Emission Factors:

Pollutant	Value	Units
NOx[1]	0.0641	lb/MMBtu

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
NOx IH1/IH2	0.22	0.96
NOx IH2/EHS	0.37	1.60
NOx RTC/RJC	0.37	1.60
NOx Entry Seal	0.37	1.60
NOx Exit Seal	0.37	1.60

Notes:

(1) Heating value and emission factors from TCEQ NSR guidance on flare emission calculations.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss_calc_flares.pdf
(2) Flow rates and duration of purge provided by vendor
(3) Number of purges determined by AM operations

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Hydrogen Flare/Purge ACL 2

Inputs:

Description	Value	Units
Hydrogen Net Heating Value (1)	269	Btu/scf
Purge Flow Rates		
IH1/IH2 Flow Rate (2)	360	m^3/hr
IH2/EHS Flow Rate (2)	600	m^3/hr
RTC/RJC Flow Rate (2)	600	m^3/hr
Entry Seal Flow Rate (2)	600	m^3/hr
Exit Seal Flow Rate (2)	600	m^3/hr
Number of purges (3)	100	purges/yr
Duration of purge (2)	3	hr
Operating Hours	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
NOx IH1/IH2	0.22	0.96
NOx IH2/EHS	0.37	1.60
NOx RTC/RJC	0.37	1.60
NOx Entry Seal	0.37	1.60
NOx Exit Seal	0.37	1.60

Emission Factors:

Pollutant	Value	Units
NOx(1)	0.0641	lb/MMBtu

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
NOx IH1/IH2	0.22	0.96
NOx IH2/EHS	0.37	1.60
NOx RTC/RJC	0.37	1.60
NOx Entry Seal	0.37	1.60
NOx Exit Seal	0.37	1.60

Notes:

(1) Heating value and emission factors from TCEQ NSR guidance on flare emission calculations.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss_calc_flares.pdf
(2) Flow rates and duration of purge provided by vendor
(3) Number of purges determined by AM operations

ERM

SUPPORTING DOCUMENTATION FOR FORM 103 INSIGNIFICANT ACTIVITY

ArcelorMittal
Calvert, Alabama
PSD Permit Application for NOES Project
Emissions Estimates Annealing and Pickling Line Cooling Section

Inputs:

Description	Value	Units
Stack Exhaust Flow Rate[1]	25,485	dscfm
Hours of Operation	8,760	hr/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM	0.48	2.09
Filterable PM_{10}	0.30	1.33
Filterable $PM_{2.5}$	0.001	0.004

Emission Factors:

Pollutant	Value	Units
Filterable PM[2]	0.0022	gr/dscf
PM_{10} % of Particulate Emissions[3]	63.5%	%
$PM_{2.5}$ % of Particulate Emissions[3]	0.21%	%

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM	0.48	2.09
Filterable PM/PM10	0.30	1.33
Filterable $PM_{2.5}$	0.001	0.004

Notes:
(1) Stack Exhaust Flow Rate obtained from vendor
(2) Emission factors obtained from vendor
(3) PM_{10} and $PM_{2.5}$ speciation based on using cooling tower calculation methodology due to the nature of the operation and how similar PM emissions are generated from water evaporating.

ERM

APPENDIX C ADEM AIR PERMIT APPLICATION FORMS

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION ADEM FORM 103

Do not Write in This Space

Facility Number [ ][ ][ ] - [ ][ ][ ][ ]

CONSTRUCTION/OPERATING PERMIT APPLICATION FACILITY IDENTIFICATION FORM		
1. Name of Facility or Organization: AM Calvert, L.L.C.		
Plant Name		
Facility Physical Location Address		
Street & Number: 1 AMNS Way		
City: Calvert	County: Mobile	Zip: 36513
Facility Mailing Address (If different from above)		
Mailing Contact: Jacqueline Gorski		
Address or PO Box: 1 AMNS WAY, P.O. Box 456		
City: Calvert	State: Alabama	Zip: 36513
Facility Billing Address		
2. Billing Contact: Jacqueline Gorski		
Street & Number: 1 AMNS WAY		
City: Calvert	State: Alabama	Zip: 36513
Telephone Number: (251) 289-3395	E-mail Address: jacqueline.gorski@arcelormittal.com	
Responsible Official's Business Mailing Address		
3. Responsible Official: Keith Howell		Title: Chief Operations Officer
Street & Number: 833 W. Lincoln Hwy, Suite 200E		
City: Shererville	State: Indiana	Zip: 46735
Telephone Number: (219) 256-7264	E-mail Address: keith.howell@arcelormittal.com	
RO under delegated authority? ☐ Yes ☐ No (if "yes", provide appropriate documentation)		
Plant Contact Information		
4. Plant Contact: Jacqueline Gorski		Title: Senior Engineer, Project Management
Telephone Number: (251) 289-3395	E-mail Address: jacqueline.gorski@arcelormittal.com	

5. Location Coordinates:				
UTM:	405.462	E-W	3,446.821	N-S
Latitude/Longitude:	31.151550	LAT	-87.991827	LONG

6. Permit application is being made to obtain the following type permit:

- ☐ Air permit
- ☒ Major source operating permit
- ☐ Synthetic minor source operating permit

7. Permit application is made for:

- ☐ Existing source (initial application)
- ☐ Existing source (permit renewal)
- ☒ Modification
- ☐ New source (to be constructed)
- ☐ Change of ownership
- ☐ Other (specify) ______________________________

Date construction/modification to begin: ______________________ to be completed: ______________________

8. Indicate the number of each of the following forms attached and made a part of this application (if a form does not apply to your operation, indicate "N/A" in the space provided). Multiple forms may be used as required.

2	ADEM 104 INDIRECT HEATING EQUIPMENT
9	ADEM 105 MANUFACTURING OR PROCESSING OPERATION
N/A	ADEM 106 REFUSE HANDLING, DISPOSAL, AND INCINERATION
2	ADEM 107 STATIONARY INTERNAL COMBUSTION ENGINES
N/A	ADEM 108 LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS
2	ADEM 109 VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES
16	ADEM 110 AIR POLLUTION CONTROL DEVICE
N/A	ADEM 112 SOLVENT METAL CLEANING
N/A	ADEM 437 COMPLIANCE SCHEDULE
N/A	ADEM 438 CONTINUOUS EMISSION MONITORS

9. General nature of business: (describe and list appropriate standard industrial classification (SIC) and North American Industry Classification System (NAICS) (www.naics.com) code(s)):

SIC = 3312 Steel Works, Blast Furnace and Rolling Mills

NAIC = 331111 Iron and Steel Mills

10. Summarize each pollutant emitted and the potential facility-wide annual emission rate for the pollutant. Indicate those pollutants for which the facility is major.

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
Total PM10	767.86	● Yes ○ No
Total PM2.5	749.84	● Yes ○ No
Nitrogen Oxides (NOx)	1,927.00	● Yes ○ No
Sulfur Oxides	858.17	● Yes ○ No
Carbon Monoxide	4,988.39	● Yes ○ No
Volatile Organic Compounds (VOCs)	653.08	● Yes ○ No
Lead	3.87	○ Yes ● No
Chlorine	11.27	● Yes ○ No
Hydrochloric Acid	19.53	● Yes ○ No
Hazardous Air Pollutants (HAPs)	63.83	● Yes ○ No
Carbon Dioxide Equivalent (CO2e)	3,446,002.93	● Yes ○ No
		○ Yes ● No
		○ Yes ○ No
		○ Yes ○ No
		○ Yes ○ No
		○ Yes ○ No
		○ Yes ○ No
		○ Yes ○ No
		○ Yes ○ No
		○ Yes ○ No
		○ Yes ○ No

*Potential emissions are either the maximum allowed by the regulations or by permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity. Total includes co-located emissions from AM/NS Calvert for PSD.

11. Provide a scaled map which contains clearly marked emission points, building locations, property boundaries, and directions (North, etc.). Labeling of emission points should be consistent across all forms.

12. Indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: N/A

(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status IN[2]	Compliance Status OUT[3]
COOL_1	Filterable PM/PM10	0.0005% Drift	PSD	Routine Preventative Maintenance	☑	☐
EGEN 1	Filterable PM/PM10	0.20 g/KW-hr	PSD	EPA Method 5	☑	☐
EGEN 1	NOx	6.4 g/KW-hr	NSPS	EPA Method 7E	☑	☐
EGEN 1	VOC	6.4 g/KW-hr	NSPS	EPA Method 18 or 25A	☑	☐
EGEN 2	Filterable PM/PM10	0.20 g/KW-hr	PSD	EPA Method 5	☑	☐
EGEN 2	NOx	6.4 g/KW-hr	NSPS	EPA Method 7E	☑	☐
EGEN 2	VOC	6.4 g/KW-hr	NSPS	EPA Method 18 or 25A	☑	☐
PICKL	Filterable PM/PM10	0.001 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	☑	☐
BOIL_1	Filterable PM/PM10	0.0019 lb/MMBtu	PSD	EPA Method 5	☑	☐
BOIL_1	NOx	0.036 lb/MMBtu	PSD	EPA Method 7E	☑	☐
BOIL_1	VOC	0.0054 lb/MMBtu	PSD	EPA Method 18 or 25A	☑	☐

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

12. Indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: N/A

(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
BOIL_2	Filterable PM/PM10	0.0019 lb/MMBtu	PSD	EPA Method 5	☑	☐
BOIL_2	NOx	0.036 lb/MMBtu	PSD	EPA Method 7E	☑	☐
BOIL_2	VOC	0.0054 lb/MMBtu	PSD	EPA Method 18 or 25A	☑	☐
RTO_1	Filterable PM/PM10	0.0019 lb/MMBtu	PSD	EPA Method 5	☑	☐
RTO_1	NOx	0.077 lb/MMBtu	PSD	EPA Method 7E	☑	☐
RTO_1	VOC	0.0054 lb/MMBtu	PSD	EPA Method 18 or 25A	☑	☐
RTO_2	Filterable PM/PM10	0.0019 lb/MMBtu	PSD	EPA Method 5	☑	☐
RTO_2	NOx	0.077 lb/MMBtu	PSD	EPA Method 7E	☑	☐
RTO_2	VOC	0.0054 lb/MMBtu	PSD	EPA Method 18 or 25A	☑	☐
AEAL1	Filterable PM/PM10	0.0019 lb/MMBtu	PSD	EPA Method 5	☑	☐
AEAL1	NOx	0.050 lb/MMBtu	PSD	EPA Method 7E	☑	☐

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

12. Indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: N/A

(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status IN[2]	Compliance Status OUT[3]
AEAL1	VOC	0.0054 lb/MMBtu	PSD	EPA Method 18 or 25A	✓	
SPRY_R	Filterable PM/PM10	0.07 lb/hr	PSD	EPA Method 5	✓	
SPRY_R	NOx	0.71 lb/hr	PSD	EPA Method 7E	✓	
SPRY_R	VOC	0.0054 lb/MMBtu	PSD	EPA Method 18 or 25A	✓	
CLEAN_1	Filterable PM/PM10	0.003 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	✓	
CLEAN_2	Filterable PM/PM10	0.003 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	✓	
CRM_1	Filterable PM/PM10	0.0026 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	✓	
CRM_2	Filterable PM/PM10	0.0026 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	✓	
OXIDE	Filterable PM/PM10	0.0061 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	✓	
TNK_FM	Filterable PM/PM10	0.001 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	✓	
SHOT_B	Filterable PM10	0.0004 gr/dscf	PSD	EPA Method 5 (Front-Half Only)	✓	

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

12. Indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: ______________________________
(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status IN[2]	OUT[3]
ACL_C1	Filterable PM/PM10	1 mg/m3	PSD	EPA Method 5	☐	☐
ACL_C1	VOC	6.6 mg/m3	PSD	EPA Method 18 or 25A	☐	☐
ACL_C2	Filterable PM/PM10	1 mg/m3	PSD	EPA Method 5	☐	☐
ACL_C2	VOC	6.6 mg/m3	PSD	EPA Method 18 or 25A	☐	☐
QUEN_1	Filterable PM/PM10	0.11 lb/hr	PSD	EPA Method 5	☐	☐
QUEN_2	Filterable PM/PM10	0.11 lb/hr	PSD	EPA Method 5	☐	☐
HYPU_A1-A5	NOx	0.0641 lb/MMBtu	PSD	EPA Method 7E	☐	☐
HYPU_B1-B5	NOx	0.0641 lb/MMBtu	PSD	EPA Method 7E	☐	☐
					☐	☐
					☐	☐
					☐	☐

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

13. For those applying for a major source operating permit, list all insignificant activities and the basis for listing them as such (i.e., less than the insignificant activity thresholds or on the list of insignificant activities). Attach any documentation needed, such as calculations. No unit subject to an NSPS, NESHAP or MACT standard can be listed as insignificant.

Insignificant Activity	Basis
APL Cooling Section	**Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]**

14. List and explain any facility-wide exemptions from applicable requirements the facility is claiming:

a. 40 CFR 60 Subpart Kb is not applicable as AM/NS as no gasoline and diesel storage tanks have a capacity

b. 40 CFR 63 Subpart EEEEE is not applicable as AM/NS does not perform these activities.

c. 40 CFR 63 Subpart FFFFF is not applicable as AM/NS is not an integrated iron and steel manufacturing fac

d. AAC 335-3-7 is not applicable as no sources from this project are defined as grey iron cupolas, blast furnace

e. AAC 335-3-8 is not applicable as the boilers do not have a capacity of greater than 250 MMBtu/hr

f.

g.

h.

i.

15. List below other attachments that are a part of this application(all supporting engineering calculations must be appended):

a. Appendix A - Process Layout and Flow Diagrams

b. Appendix B – Emission Calculations

c. Appendix C – Forms

d. Appendix D – BACT

e. Appendix E – RBLC Tables

f. Appendix F - CAM

g. Appendix G - Air Dispersion Modeling Report

h.

i.

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Phone 616-656-4636 Email: Jeff.Twaddle@erm.com

Signature: [signature] Date: 2/7/2025

I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE.

I ALSO CERTIFY THAT THE SOURCE WILL CONTINUE TO COMPLY WITH APPLICABLE REQUIREMENTS FOR WHICH IT IS IN COMPLIANCE, AND THAT THE SOURCE WILL, IN A TIMELY MANNER, MEET ALL APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM AND SUBMIT A DETAILED SCHEDULE, IF NEEDED FOR MEETING THE REQUIREMENTS.

[signature] . 02/06/2025

SIGNATURE OF RESPONSIBLE OFFICIAL TITLE DATE

PERMIT APPLICATION FOR INDIRECT HEATING EQUIPMENT
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

Do not write in this space

1. Name of facility or organization: AM Calvert, LLC
2. Unit Description (i.e. No. 1 Power Boiler): Boiler 1

   Source Classification Code(s): 10300602

   Equipment manufacturer's information

   Name of manufacturer: TBD

   Model number: TBD

   Rated capacity-input: 45.50 (MMBtu/hr.)

   Boiler type: ☐ Fire Tube ☒ Water Tube ☐ Other (specify):

   Manufactured date: TBD

   Proposed installation date: 05/2025

   Original installation date (if existing):

   Reconstruction/Modification date (if applicable):

3. Type of fuel used:

   Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

4. Purpose (if multipurpose, note percent in each use category):

- ☐ Space heat ______ %
- ☐ Power generation ______ %
- ☒ Process heat 100 %
- ☐ Other (specify) ______ % ______

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

7. Are you requesting a limitation for permitting? ☐ Yes ☒ No if "yes", specify the limit and affected unit(s):

8. Is there any emission control equipment on this emission source?

☐ Yes ☒ No (If "yes", ADEM Form 110 must be completed and attached)

9. Stack data (if a control device is installed, the information should be for the control device's stack exit; if multiple stacks associated, provide additional sheet):

Stack No. & Description: BOIL_1, Boiler 1 Stack Type: Point

Stack UTM Coordinate (E-W)	405.16	(km)	Stack UTM Coordinate (N-S)	3,444.85	(km)
Latitude	31.1337	(LAT)	Longitude	-87.9948	(LONG)
Height above grade	98.43	(ft)	Gas temperature at exit	302	(ºF)
Inside diameter at exit (round)	2.68	(ft)	Gas Velocity	54.13	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	18,150	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

10. Is this item subject to the Transport Rule 335-3-8-.07 or NOX Budget Program under 335-3-8-.71?

☐ Yes ☒ No If "Yes", provide ORIS Plant and Unit ID:______

11. Is this item in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No if "No", a compliance schedule, ADEM Form 437, must be attached.)

12. Fugitive Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate						
PM-10 Filterable						
PM-2.5 Filterable						
PM-Condensible						
Sulfur dioxide						
Nitrogen oxides						
Carbon monoxide						
VOC's						

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

13. Point Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	0.34	1.48			AP-42	0.0075 lb/ MMBtu
PM-10 Filterable	0.08	0.37			AP-42	0.0019 lb/MMBtu
PM-2.5 Filterable	0.08	0.37			AP-42	0.0019 lb/MMBtu
PM-Condensible	0.25	1.11			AP-42	0.0056 lb/MMBtu
Sulfur dioxide	0.03	0.12			BACT	0.0006 lb/MMBtu
Nitrogen oxides	1.64	7.17			BACT	0.036 lb/MMBtu
Carbon monoxide	3.37	14.75			BACT	0.074 lb/MMBtu
VOC's	0.25	1.07			BACT	0.0055 lb/MMBtu

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR INDIRECT HEATING EQUIPMENT
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
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1. Name of facility or organization: AM Calvert, LLC

2. Unit Description (i.e. No. 1 Power Boiler): Boiler 2

   Source Classification Code(s): 10300602

   Equipment manufacturer's information

   Name of manufacturer: TBD

   Model number: TBD

   Rated capacity-input: 45.50 (MMBtu/hr.)

   Boiler type: ☐ Fire Tube ☒ Water Tube ☐ Other (specify):

   Manufactured date: TBD

   Proposed installation date: 05/2025

   Original installation date (if existing):

   Reconstruction/Modification date (if applicable):

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

4. Purpose (if multipurpose, note percent in each use category):

- ☐ Space heat ______ %
- ☐ Power generation ______ %
- ☒ Process heat 100 %
- ☐ Other (specify) ______ % ______

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

7. Are you requesting a limitation for permitting? ☐ Yes ☒ No if "yes", specify the limit and affected unit(s):

8. Is there any emission control equipment on this emission source?

☐ Yes ☒ No (If "yes", ADEM Form 110 must be completed and attached)

9. Stack data (if a control device is installed, the information should be for the control device's stack exit; if multiple stacks associated, provide additional sheet):

Stack No. & Description: BOIL_2 , Boiler 2 Stack Type: Point

Stack UTM Coordinate (E-W)	405.1521	(km)	Stack UTM Coordinate (N-S)	3,444.837	(km)
Latitude	31.1336	(LAT)	Longitude	-87.9948	(LONG)
Height above grade	98.43	(ft)	Gas temperature at exit	302	(ºF)
Inside diameter at exit (round)	2.68	(ft)	Gas Velocity	54.13	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	18,150	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

10. Is this item subject to the Transport Rule 335-3-8-.07 or NOX Budget Program under 335-3-8-.71?

☐ Yes ☒ No If "Yes", provide ORIS Plant and Unit ID:______

11. Is this item in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No if "No", a compliance schedule, ADEM Form 437, must be attached.)

12. Fugitive Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate						
PM-10 Filterable						
PM-2.5 Filterable						
PM-Condensible						
Sulfur dioxide						
Nitrogen oxides						
Carbon monoxide						
VOC's						

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

13. Point Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	0.34	1.48			AP-42	0.0075 lb/ MMBtu
PM-10 Filterable	0.08	0.37			AP-42	0.0019 lb/MMBtu
PM-2.5 Filterable	0.08	0.37			AP-42	0.0019 lb/MMBtu
PM-Condensible	0.25	1.11			AP-42	0.0056 lb/MMBtu
Sulfur dioxide	0.03	0.12			BACT	0.0006 lb/MMBtu
Nitrogen oxides	1.64	7.17			BACT	0.036 lb/MMBtu
Carbon monoxide	3.37	14.75			BACT	0.074 lb/MMBtu
VOC's	0.25	1.07			BACT	0.0054 lb/MMBtu

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: Jeff A Twaddle Date: 3/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

| | | | - | | | | | - | | | | |

Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

Cold rolled coils are processed through the continuous annealing and coating line (ACL) to produce the end product with correct metallurgical properties. The continuous strip passes first through a cleaning section to remove the iron fines and oils that remain on the strip after cold rolling. The strip is cleaned with an alkaline degreasing solution (NaOH and demineralized water) in a series of sprays, brushes, and electrolytic cleaning tanks. After electrolytic cleaning, the strip passes through brush rinse section, followed by a cascade spray rinse with demineralized water, and finally a blow-off and hot air dryer. After cleaning, the strip is annealed in a fully electric furnace with hydrogen atmosphere. The strip is progressively heated to and held at the required temperature using only electrical heating elements, and then cooled at a controlled rate. There are no emissions from the annealing furnace during normal operations because of the fully electric technology. Only emissions generated by gas purging, when required, are vented.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Annealing and Coating Line 1

Source Classification Code(s): 30400305

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Rolled Steel Coil	24.5 ton/hr	N/A	165,000 tpy

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Coils	165,000	Metric Tons

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

9. Are you requesting a limitation for permitting? ☐Yes ■No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

■Yes ☐No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
CLEAN_1	Point	☐	405.07	3,444.60	31.1306	-87.9963	97.83	N/A	48	2.53	N/A	49.21	14,800.25	167
ACL_C1	Point	☐	405.21	3,444.80	31.1333	-87.9943	91.57	N/A	48	2.26	N/A	48.59	11,734.09	176
QUEN_1	Point	☐	405.23	3,444.83	31.1336	-87.9941	91.57	N/A	48	6.89	N/A	46.03	102,965.68	132.8
HYPU_A1	Point	☐	405.12	3,444.63	31.1318	-87.9952	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_A2	Point	☐	405.12	3,444.63	31.1318	-87.9952	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_A3	Point	☐	405.13	3,444.64	31.1319	-87.9952	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_A4	Point	☐	405.21	3,444.81	31.1334	-87.9942	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_A5	Point	☐	405.22	3,444.82	31.1335	-87.9942	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
		☐												
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
CLEAN_1	☐	Filterable PM/P	0.38	1.66			BACT	0.0030 gr/dscf
CLEAN_1	☐	Filterable PM2.	0.38	1.66			BACT	0.0030 gr/dscf
ACL_C1	☐	Filterable PM/P	0.37	1.60			BACT	1 mg/m3
ACL_C1	☐	Filterable PM2.	0.37	1.60			BACT	1 mg/m3
ACL_C1	☐	VOC	2.41	10.55			BACT	6.6 mg/m3
QUEN_1	☐	PM10	0.11	0.46			BACT	0.11 lb/hr
QUEN_1	☐	PM2.5	0.0004	0.002			BACT	0.0004 lb/hr
HYPU_A1	☐	NOx	0.22	0.96			BACT	0.0641 lb/MMBtu
HYPU_A2	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
HYPU_A3	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
HYPU_A4	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
HYPU_A5	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
	☐							
	☐							
	☐							
	☐							

13. On a separage sheet, provide a flow diagram to:
(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

Cold rolled coils are processed through the continuous annealing and coating line (ACL) to produce the end product with correct metallurgical properties. The continuous strip passes first through a cleaning section to remove the iron fines and oils that remain on the strip after cold rolling. The strip is cleaned with an alkaline degreasing solution (NaOH and demineralized water) in a series of sprays, brushes, and electrolytic cleaning tanks. After electrolytic cleaning, the strip passes through brush rinse section, followed by a cascade spray rinse with demineralized water, and finally a blow-off and hot air dryer. After cleaning, the strip is annealed in a fully electric furnace with hydrogen atmosphere. The strip is progressively heated to and held at the required temperature using only electrical heating elements, and then cooled at a controlled rate. There are no emissions from the annealing furnace during normal operations because of the fully electric technology. Only emissions generated by gas purging, when required, are vented.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Annealing and Coating Line 2

Source Classification Code(s): 30400305

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Rolled Steel Coil	24.5 ton/hr	N/A	165,000 tpy

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Coils	165,000	Metric Tons

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

9. Are you requesting a limitation for permitting? ☐Yes ■No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

■Yes ☐No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
CLEAN_2	Point	☐	405.09	3,444.58	31.1313	-87.9954	94.85	N/A	48	2.53	N/A	49.21	11,734.09	167
ACL_C2	Point	☐	405.23	3,444.79	31.1332	-87.9941	91.57	N/A	48	2.26	N/A	48.59	11,734.09	176
QUEN_2	Point	☐	405.25	3,444.82	31.1335	-87.9939	91.57	N/A	48	6.89	N/A	46.03	102,965.68	132.8
HYPU_B1	Point	☐	405.14	3,444.62	31.1317	-87.9950	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_B2	Point	☐	405.14	3,444.62	31.1317	-87.9950	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_B3	Point	☐	405.15	3,444.63	31.1318	-87.9949	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_B4	Point	☐	405.24	3,444.80	31.1333	-87.9940	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
HYPU_B5	Point	☐	405.24	3,444.81	31.1334	-87.9939	91.57	N/A	48	1.25	N/A	63.94	4,683.55	662
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
CLEAN_2	☐	Filterable PM/P	0.378	1.657			BACT	0.0030 gr/dscf
CLEAN_2	☐	Filterable PM2.	0.378	1.657			BACT	0.0030 gr/dscf
ACL_C2	☐	Filterable PM/P	0.37	1.60			BACT	1 mg/m3
ACL_C2	☐	Filterable PM2.	0.37	1.60			BACT	1 mg/m3
ACL_C2	☐	VOC	2.41	10.55			BACT	6.6 mg/m3
QUEN_2	☐	PM10	0.11	0.46			BACT	0.11 lb/hr
QUEN_2	☐	PM2.5	0.0004	0.002			BACT	0.0004 lb/hr
HYPU_B1	☐	NOx	0.22	0.96			BACT	0.0641 lb/MMBtu
HYPU_B2	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
HYPU_B3	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
HYPU_B4	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
HYPU_B5	☐	NOx	0.37	1.60			BACT	0.0641 lb/MMBtu
	☐							
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	☐							
	☐							

13. On a separage sheet, provide a flow diagram to:
(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

emission point curing section coolers

Issued by／Bearbeitet von: MERf/DS

Reference／Referenz: AMCA-ACL

Date／Datum: 2024-10-09

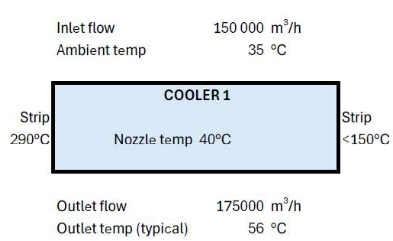
VOC OVERVIEW

		EB549	EB549 RAPID	EB5308	HAPS free	EB5350S	EB 5340	EB 500 FF	EB 5018 A	Dynophen gris	C5 (Voltatex 1250 V Fast)	C6 (Voltatex 1151 E1)	Contract value for exhaust and RTO
g	mm	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	
tv	mm m /min	36	36	36	36	36	36	36	36	36	36	36	
v	m/min	180	180	180	180	180	180	180	180	180	180	180	
w	mm	1 650	1 650	1 650	1 650	1 650	1 650	1 650	1 650	1 650	1 650	1 650	
min lamination factor		95,0%	95,0%	95,0%	95,0%	95,0%	95,0%	95,0%	95,0%	95,0%	95,0%	95,0%	
d	µm	5	5	5	5	5	5	5	5	5	5	5	
A	m²/h	35 640	35 640	35 640	35 640	35 640	35 640	35 640	35 640	35 640	35 640	35 640	
consumption	m²/kg µm										350	310	
consumption	g/m² µm	2,3	2,4	4,5	4,5	4,4	4,0	4,0	2,7	3,4			
consumption	kg/h	431	450	844	844	825	750	750	506	638	536	605	
VOC		14,6%	11,4%	8,6%	8,3%	8,5%	0,0%	7,0%	16,3%	8,5%	10,9%	8,1%	
VOC	**kg/h**	**63**	**51**	**73**	**70**	**70**	**0**	**52**	**82**	**54**	**58**	**49**	**93**
ratio		1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%
VOC	**kg/h**	**0,6**	**0,5**	**0,7**	**0,7**	**0,7**	**0,0**	**0,5**	**0,8**	**0,5**	**0,6**	**0,5**	**0,9**
VOC	**lb/h**	**1,4**	**1,1**	**1,6**	**1,5**	**1,6**	**0,0**	**1,1**	**1,8**	**1,2**	**1,3**	**1,1**	**2,1**
VOC	mg/h	628 596	513 666	725 086	699 763	704 021	0	521 469	824 522	544 016	584 174	490 126	930 000
V	m³/h	175 000	175 000	175 000	175 000	175 000	175 000	175 000	175 000	175 000	175 000	175 000	175 000
T	°C	56	56	56	56	56	56	56	56	56	56	56	56
concentration	**mg/Nm³**	**4,3**	**3,5**	**5,0**	**4,8**	**4,8**	**0,0**	**3,6**	**5,7**	**3,7**	**4,0**	**3,4**	**6,4**

VOC ALLOCATION

It can be assumed that close to 100 % of the VOC are evaporated before reaching the PMT 240°C - 290°C. However, since there is the phenomenom of post-evaporation in the coolers it was assumed that up to 1 % of the VOC is post-evaporated in the cooling zone.

Since the strip is cooled below 150°C in the first cooling section the post-evaporation is completed in cooling section 1. Therefor cooling sections 2 & 3 are not considered to emit any VOC, but only air at a temperature bellow 60°C.



PM EMISSION

Due to the rather low air temperatures in the cooling section, it is highly unlikely to have condesables escaping the coolers with the air stream. Therefor the PM values are expected to be:

PM: < 1 mg/Nm³
PM 2.5: < 1 mg/Nm³

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

The steel strips are annealed inside a continuous furnace with a controlled atmosphere containing nitrogen, hydrogen, and oxygen and at a given temperature. The primary purpose of the batch annealing furnace is to heat treat the steel strip coils to produce a more homogenous coil metallurgical structure. This is accomplished with a series of heating and cooling sections.
To control emissions, standard NOx burners, a Denox system and waste heat recovery are utilized on the furnace.
The exhaust from the annealing furnace is used for the strip preheating as an energy efficiency measure. Emissions from the furnace are emitted to the atmosphere via one stack. The annealed strip then passes through a cooling section and are cooled with a water rinse and emissions from this cooling section are vented horizontally out of the building.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Annealing Furnace

Source Classification Code(s): 30300934

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum): 93.65 MMBtu/hr

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Throughput of the APL	25.6 ton/hr	N/A	180,000 tpy

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Coils	180,000	tpy

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

9. Are you requesting a limitation for permitting? ☐ Yes ☒ No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

☒ Yes ☐ No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
AEAL1	Point	☐	405.16	3,444.84	31.1336	-87.9948	124.38	N/A	48	7.22	N/A	32.81	80,545.56	572
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.
** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
AEAL1	☐	Total PM	0.70	3.08			AP-42	0.0075 lb/MMBtu
AEAL1	☐	Filt PM/PM10	0.18	0.78			AP-42	0.0019 lb/MMBtu
AEAL1	☐	Filt PM2.5	0.18	0.78			AP-42	0.0019 lb/MMBtu
AEAL1	☐	Cond PM	0.52	2.30			AP-42	0.0056 lb/MMBtu
AEAL1	☐	SO2	0.054	0.24			AP-42	0.0006 lb/MMBtu
AEAL1	☐	NOx			4.68	20.51	BACT	0.050 lb/MMBtu
AEAL1	☐	CO	7.71	33.78			AP-42	0.082 lb/MMBtu
AEAL1	☐	VOC	0.50	2.21			AP-42	0.0054 lb/MMBtu
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13. On a separage sheet, provide a flow diagram to:
(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

A contact cooling tower will be used to provide cooling water for casting operations. During casting, the molten steel will be continuously cast to form a steel strand that will be cooled and longitudinally cut into individual slabs. The molten steel will be poured into a ladle that will go into a mold. The steel strand leaving the mold will be continuously cooled.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Cooling Tower

Source Classification Code(s): 30106417

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Cooling Water	15,170 gpm	N/A	N/A

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
N/A	N/A	N/A

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

9. Are you requesting a limitation for permitting? ☐ Yes ■ No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

☐ Yes ■ No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
COOL_1	Point	☐	405.08	3,444.82	31.1334	-87.9956	29.99	N/A	48	30.00	N/A	40.00	1,696,460.03	90
COOL_2	Point	☐	405.08	3,444.80	31.1333	-87.9956	29.99	N/A	48	30.00	N/A	40.00	1,696,460.03	90
COOL_3	Point	☐	405.07	3,444.79	31.1331	-87.9957	29.99	N/A	48	30.00	N/A	40.00	1,696,460.03	90
COOL_4	Point	☐	405.06	3,444.77	31.1330	-87.9958	29.99	N/A	48	30.00	N/A	40.00	1,696,460.03	90
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
COOL_1	☐	Filterable PM	0.15	0.66				
COOL_1	☐	Filterable PM10	0.10	0.42				
COOL_1	☐	Filterable PM2.5	0.0003	0.0014				
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13. On a separage sheet, provide a flow diagram to:
(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025v

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

			-					-				

Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

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Operating scenario number: TBD

The annealed and pickled coils are then rolled at the Reversing Cold Rolling Mill (RCM) to reduce the strip to the final substrate thickness for the end product. The RCM is a single-stand mill in which force is applied to the strip by rolls with hydraulic control to reduce thickness. The strip is in tension between two reels and is rolled in successive passes, alternating in the forward and reverse direction, until the final thickness is achieved. Oil-water emulsion spray equipment is used to lubricate the roll gap and cool the work roll barrel while maintaining control of the strip temperature profile. The emulsion system is a closed loop to collect, filter, and recirculate used emulsion. A strip blow-off drying system removes emulsion drops from the finished strip. The mill is enclosed with fume exhaust hoods over the mill and tension reels. The exhaust oil mists and fumes are conveyed from the hoods to the mist elimination system with condenser unit before venting through a stack.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Cold Rolling Mill 1

Source Classification Code(s): 30300935

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
PIckled Steel Coil	28 ton/hr	N/A	175,000 tpy

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Coils	175,000	Metric Tons

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

9. Are you requesting a limitation for permitting? ☐ Yes ■ No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

■ Yes ☐ No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
CRM_1	Point	☐	404.95	3,444.54	31.1309	-87.9969	173.89	N/A	48	8.20	N/A	34.45	109,210.79	68
		☐												
		☐												
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
CRM_1	☐	Filterable PM/P10	2.29	10.04			BACT	0.0026 gr/dscf
CRM_1	☐	Filterable PM2.5	1.49	6.52			BACT	65% PM10
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(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025v

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

The annealed and pickled coils are then rolled at the Reversing Cold Rolling Mill (RCM) to reduce the strip to the final substrate thickness for the end product. The RCM is a single-stand mill in which force is applied to the strip by rolls with hydraulic control to reduce thickness. The strip is in tension between two reels and is rolled in successive passes, alternating in the forward and reverse direction, until the final thickness is achieved. Oil-water emulsion spray equipment is used to lubricate the roll gap and cool the work roll barrel while maintaining control of the strip temperature profile. The emulsion system is a closed loop to collect, filter, and recirculate used emulsion. A strip blow-off drying system removes emulsion drops from the finished strip. The mill is enclosed with fume exhaust hoods over the mill and tension reels. The exhaust oil mists and fumes are conveyed from the hoods to the mist elimination system with condenser unit before venting through a stack.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Cold Rolling Mill 2

Source Classification Code(s): 30300935

Equipment manufacturer's information

Make: Manufacturer name – TBD   Model: Model Number – TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24   Days per week: 7   Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Pickled Steel Coil	28 ton/hr	N/A	175,000 tpy

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Coils	175,000	Metric Tons

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

9. Are you requesting a limitation for permitting? ☐ Yes ☒ No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

☒ Yes ☐ No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
CRM_2	Point	☐	405.01	3,444.51	31.1306	-87.9963	173.89	N/A	48	8.20	N/A	34.45	109,210.79	68.00
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
CRM_2	☐	Filterable PM/P10	2.29	10.04			BACT	0.0026 gr/dscf
CRM_2	☐	Filterable PM2.5	1.49	6.52			BACT	65% PM10
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13. On a separage sheet, provide a flow diagram to:
(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

Hydrochloric acid (HCl) chemically removes the ferric oxide layer from the surface of the strip.
The pickling tank is divided into separate pickling chambers. Each pickling chamber has a dedicated acid supply tank.
The pickling and acid supply tanks are fitted with covers to reduce evaporative losses and air emissions. Spent acid is pumped to the HCl regeneration plant. Acid fumes generated during pickling are captured and treated in scrubbers. Acid fumes from tank farm processes are captured and treated in the tank farm scrubber.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Continuous Pickling Line with Tank Farm

Source Classification Code(s): 30300910

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Throughput of the APL	25.6 ton/hr	N/A	180,000 tpy
Waste Pickle Liquor	2.87 ton/hr	N/A	20,635 tpy

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
Coils	180,000	tpy

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

The continuous pickling line and associated scrubber as well as the tank farm scrubber are subject to 40 CFR 63 Subpart CCC. Applicable requirements are described in Section 4.4.3 of the application report.

9. Are you requesting a limitation for permitting? ☐ Yes ■ No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

■ Yes ☐ No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
PICKL	Point	☐	405.06	3,444.67	31.132	-87.995	88.00	N/A	48	3.94	N/A	32.81	23,963.97	212
TNK_FM	Point	☐	404.98	3,444.65	31.131	-87.996	81.99	N/A	48	1.84	N/A	84.28	13,407.15	176
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
PICKL	☐	Filterable PM/P			0.20	0.87	BACT	0.001 gr/dscf
PICKL	☐	Filterable PM2.			0.20	0.87	BACT	96% PM10
PICKL	☐	Condensable P			0.15	0.68	BACT	78% PM10
PICKL	☐	HCl			0.60	2.64	40 CFR 63 CCC	6 ppm
TNK_FM	☐	Filterable PM/P			0.12	0.51	BACT	0.001 gr/dscf
TNK_FM	☐	Filterable PM2.			0.11	0.49	EPA PM Calculato	96% PM10
TNK_FM	☐	Condensable P			0.09	0.40	EPA PM Calculato	78% PM10
TNK_FM	☐	HCl			0.92	4.04	40 CFR 63 CCC	12 ppm
TNK_FM	☐	CL2			0.90	3.92	40 CFR 63 CCC	6 ppm
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13. On a separage sheet, provide a flow diagram to:
(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

Once annealed, cooled down and dried out, the scale at the surface of the strip is mechanically broken off with a shot blaster. A scale collection system that removes solids and dust generated during the process vents the air through a baghouse to the atmosphere.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Shot Blaster

Source Classification Code(s): 30900207

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
N/A	N/A	N/A	N/A

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other	N/A					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)	N/A					

7. Products of process or unit:

Products	Quantity/year	Units of production
N/A	N/A	N/A

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

None

9. Are you requesting a limitation for permitting? ☐Yes ■No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

■Yes ☐No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
SHOT_B	Point	☐	405.10	3,444.74	31.13273	-87.9954	94.85	N/A	48	4.27	N/A	32.81	28,124.38	212
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
SHOT_B	☐	Filterable PM			0.67	2.95	BACT	0.003 gr/dscf
SHOT_B	☐	Filterable PM1(			0.10	0.42	BACT	0.0004 gr/dscf
SHOT_B	☐	Filterable PM2.:			0.01	0.04	BACT	0.00004 gr/dscf
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13. On a separage sheet, provide a flow diagram to:
(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

■ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

■ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ■ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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1. Name of facility or organization: AM Calvert, LLC

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number: TBD

The spray roaster ARP processes ferrous chloride solution (FCS) produced by the pickling lines to regenerate hydrochloric acid (HCl) and procudes solid iron oxide (Fe2O3). FCS from the pickling lines is transferred via closed pipeline and stored in a tank farm. The FCS is first concentrated by a heat transfer in a venturi scrubber using hot off gasses from a spray roaster. The concentrated FCS, referred to a concentrated pickle liquor, is then fed to the spray roaster as a fine spray. The spray roaster utilizes natural gas burners to generate heat for dehydration and chemical processing of the CPL. Solid iron oxide generated at the bottom of the spray roaster is stored in iron oxide bins and shipped offsite. Emissions from the iron oxide bins are controlled by bag

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Spray Roaster Acid Regeneration Plant, Iron Oxide Bins

Source Classification Code(s): 3031579

Equipment manufacturer's information

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum):

Manufactured date: TBD

Proposed installation date: 05/2025

Original installation date (if existing):

Reconstruction/Modification date (if applicable):

4. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Ferrous Chloride Solution	41,019	41,019	179,665

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): N/A MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other						

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Iron Oxide	22,530	MT/year
18% HCl Solution	131,400	Cubic meters per year

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

40 CFR 63 Subpart CCC

9. Are you requesting a limitation for permitting? ☐ Yes ■ No if "yes", specify the limit and affected unit(s):

10. Is there any emission control equipment on this emission source?

■ Yes ☐ No (if "yes", ADEM Form 110 must be completed and attached).

11. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
SPRY_R	Point	☐	405.01	3,444.67	31.1321	-87.9963	150.00	N/A	48	1.64	N/A	16.40	2,080.21	149
OXIDE	Point	☐	405.00	3,444.65	31.1319	-87.9965	100.00	N/A	48	1.18	N/A	64.60	4,246.65	185
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* Std temperature is 68ºF - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any diffierent operating scenarios.

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if Fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
SPRY_R	☐	Filterable PM/PM10			0.07	0.31	BACT	0.07 lb/hr
SPRY_R	☐	Filterable PM2.5			0.07	0.31	BACT	0.07 lb/hr
SPRY_R	☐	NOx			0.71	3.09	BACT	0.71 lb/hr
SPRY_R	☐	SO2			0.01	0.03	AP-42	0.0006 lb/MMBtu
SPRY_R	☐	VOC			0.07	0.31	AP-42	0.0054 lb/MMBtu
SPRY_R	☐	CO			1.07	4.68	AP-42	0.082 lb/MMBtu
SPRY_R	☐	CL2			0.12	0.55	40 CFR 63 Subpart	6 ppm
SPRY_R	☐	HCL			0.13	0.56	40 CFR 63 Subpart	12 ppm
OXIDE	☐	Filterable PM/PM10			0.17	0.76	BACT	0.0061 gr/dscf
OXIDE	☐	Filterable PM2.5			0.16	0.72	EPA PM Calculator	94% PM10
OXIDE	☐	Condensable PM			0.14	0.59	EPA PM Calculator	78% PM10
OXIDE	☐	Total PM10			0.31	1.35	N/A	N/A
OXIDE	☐	Total PM2.5			0.30	1.31	N/A	N/A
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13. On a separage sheet, provide a flow diagram to:
   (1) Illustrate input of raw materials,
   (2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
   (3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

14. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No

(if "no", a compliance schedule, ADEM Form 437 must be completed and attached.)

15. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ Yes ☐ No

16. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☒ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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1. Name of facility or organization: AM Calvert, LLC

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ☐ Update information for an engine currently installed at the facility
- ☑ Title V Application
- ☐ Other, specify:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _______________

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _______________

3. Engine Identification:

A. Manufacturer Name: Manufacturer name – TBD B. Model No.: Model Number – TBD C. Model Year: TBD

D. Facility's Identification or Description: EGEN1 E. Serial No.: TBD

4. Engine Applicability Dates:

A. Date Ordered (New): 05/2025 B. Date Manufactured: TBD C. Date Modified/Reconstructed

D. For a used engine, approximate date engine was first put in service at any location:

5. Engine Function:

- ☐ Compression
- ☐ NFPA Certified
- ☐ Test Cell/Stand
- ☐ Research & Development
- ☑ Electrical Generation (Max Output): 2,000
- ☐ Fire/Other Pump Driver
- ☐ Other, please describe:

6. Engine Operation:

- ☐ Non-Emergency (provide typical operating schedule in A-D):
- ☑ Emergency Only
- ☐ Limited Use (<100 hr/yr)

A. Hours/day:

B. Days/week:

C. Weeks/year:

D. Peak Season (if any): N/A

7. Engine Specifications:

A. Max Brake Horsepower (bhp): B. Max Engine Power (kWm): 2,667 C. Max Heat Input (MMBtu/hr):

D. Type:
- ☐ Simple Cycle Turbine
- ☐ Combined Cycle Turbine
- ☐ Regenerative Cycle Turbine
- ☑ Reciprocating Engine

E. Piston Movement:
- ☐ 2-Stroke RICE
- ☑ 4-Stroke RICE
- ☐ N/A
- ☐ Other:

F. Air/Fuel Mix:
- ☐ Rich Burn Rice
- ☐ Lean Burn RICE
- ☐ Diffusion Flame Turbine
- ☐ Lean Premix Turbine
- ☐ Other:

G. Ignition Type
- ☐ Spark
- ☑ Compression
- ☐ N/A

H. Cylinder Displacement: ____________ (Liters/cylinder)

8. Compressor Specifications:

A. Compressor Type ____________ B. Compressor Mfg. Date ____________ C. Location on well? ☐ Yes ■ No

D. Compressor Instal. Date: ____________ E. Compressor Serial No.: ____________ F. Compressor Brake Horsepower (bhp):

9. Fuel Information:

	Fuel Type/ Desc.	Heat Content	Sulfur Content (% by weight or ppm)	Fuel-Bound Nitrogen Content (% by weight or ppm)	% of Gross Heat Input	Max Ash %	Used Oil Supplier
Primary	Diesel		15				
Secondary/ Backup							

10. Point Source Emissions:

POLLUTANT	UNCONTROLLED[1] POTENTIAL EMISSIONS		CONTROLLED[2] POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	1.21	0.30			40 CFR 60 Subpart IIII	1.21 lb/hr
PM-10 Filterable	1.18	0.29			40 CFR 60 Subpart IIII	0.20 g/kW-hr
PM-2.5 Filterable	1.18	0.29			Assumed equal to PM10	0.20 g/kW-hr
PM-Condensable	0.03	0.007			EPA PM Calculator	2.3% PM10
Sulfur dioxide	0.04	0.009			15ppm sulfur fuel content	0.00001 lb/kW-hr
Nitrogen oxides	37.63	9.41			40 CFR 60 Subpart IIII	6.4 g/kW-hr
Carbon monoxide	20.58	5.14			40 CFR 60 Subpart IIII	3.5 g/kW-hr
VOC's	37.63	9.41			40 CFR 60 Subpart IIII	6.4 g/kW-hr

Attach calculation worksheets. Manufacturer specification sheets should be provided if used as the basis for emission estimates. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

11. Applicable Regulations:

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stat. Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stat. Combustion. Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stat. RICE
- ☑ 40 CFR 60, Subpart IIII, NSPS for Stat. Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stat. Spark Ignition ICE
- ☐ Other: ....

Does this unit have an EPA Certificate of Conformity? ■ Yes ☐ No if yes, please provide: ....

12. Regulatory Standards, Limitations, and Requirements:

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
Filterable PM/PM10	0.20	g/KW-hr	PSD	
NOx	6.4	g/KW-hr	NSPS, Subpart IIII	
VOC	6.4	g/KW-hr	NSPS, Subpart IIII	

3. for federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit, specify either SMS-PSD or SMS- Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? ☐ N/A ■ Yes ☐ No
(if yes, provide a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? ■ Yes ☐ No

13. Pollution Control Information:

A. Device/Technology Type(s)

- ☑ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NOX Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction(SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Diesel Particulate Filter
- ☐ Other ____________
- ☐ Other ____________

B. Control Efficiencies

Pollutant	% Reduction
NO_X	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this item in compliance with all applicable air pollution rules and regulations?

■ Yes ☐ No (if "no", a compliance schedule, ADEM Form 437, must be attached.

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit)

Emission Point & Description: EGEN_1

Stack Type: ____________

Stack UTM Coordinate (E-W)	405.144	(km)	Stack UTM Coordinate (N-S)	3,444.82	(km)
Latitude	31.133	(LAT)	Longitude	-87.995	(LONG)
Height above grade	7.9	(ft)	Gas temperature at exit	752	(ºF)
Inside diameter at exit (round)	0.67	(ft)	Gas Velocity	723	(ft/Sec)
Inside area at exit (not round)		(ft^2)	Volume of gas discharged	15,295	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height		(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☐ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☐ No

If yes, provide units:

16. Clarifying/Supplemental Information (Optional):

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ☐ Update information for an engine currently installed at the facility
- ☑ Title V Application
- ☐ Other, specify:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: _______________

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: _______________

3. Engine Identification:

A. Manufacturer Name: Manufacturer name – TBD B. Model No.: Model Number – TBD C. Model Year: TBD

D. Facility's Identification or Description: EGEN2 E. Serial No.: TBD

4. Engine Applicability Dates:

A. Date Ordered (New): 05/2025 B. Date Manufactured: TBD C. Date Modified/Reconstructed

D. For a used engine, approximate date engine was first put in service at any location:

5. Engine Function:

- ☐ Compression
- ☐ NFPA Certified
- ☐ Test Cell/Stand
- ☐ Research & Development
- ☑ Electrical Generation (Max Output): 250
- ☐ Fire/Other Pump Driver
- ☐ Other, please describe:

6. Engine Operation:

- ☐ Non-Emergency (provide typical operating schedule in A-D):
- ☑ Emergency Only
- ☐ Limited Use (<100 hr/yr)

A. Hours/day:
B. Days/week:
C. Weeks/year:
D. Peak Season (if any): N/A

7. Engine Specifications:

A. Max Brake Horsepower (bhp): B. Max Engine Power (kWm): 333 C. Max Heat Input (MMBtu/hr):

D. Type:
- ☐ Simple Cycle Turbine
- ☐ Combined Cycle Turbine
- ☐ Regenerative Cycle Turbine
- ☑ Reciprocating Engine

E. Piston Movement:
- ☐ 2-Stroke RICE
- ☑ 4-Stroke RICE
- ☐ N/A
- ☐ Other:

F. Air/Fuel Mix:
- ☐ Rich Burn Rice
- ☐ Lean Burn RICE
- ☐ Diffusion Flame Turbine
- ☐ Lean Premix Turbine
- ☐ Other:

G. Ignition Type
- ☐ Spark
- ☑ Compression
- ☐ N/A

H. Cylinder Displacement: ____________ (Liters/cylinder)

8. Compressor Specifications:

A. Compressor Type ______________ B. Compressor Mfg. Date __________ C. Location on well? ☐ Yes ■ No

D. Compressor Instal. Date: ________ E. Compressor Serial No.: ____________ F. Compressor Brake Horsepower (bhp):

9. Fuel Information:

	Fuel Type/ Desc.	Heat Content	Sulfur Content (% by weight or ppm)	Fuel-Bound Nitrogen Content (% by weight or ppm)	% of Gross Heat Input	Max Ash %	Used Oil Supplier
Primary	Diesel		15				
Secondary/ Backup							

10. Point Source Emissions:

POLLUTANT	UNCONTROLLED[1] POTENTIAL EMISSIONS		CONTROLLED[2] POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	0.153	0.04			40 CFR 60 Subpart IIII	0.153 lb/hr
PM-10 Filterable	0.15	0.04			40 CFR 60 Subpart IIII	0.2 g/kW-hr
PM-2.5 Filterable	0.15	0.04			Assumed equal to PM10	0.2 g/kW-hr
PM-Condensable	0.003	0.0008			EPA PM Calculator	2.3% PM10
Sulfur dioxide	0.005	0.0012			15ppm sulfur fuel content	0.00001 lb/kW-hr
Nitrogen oxides	2.94	0.73			40 CFR 60 Subpart IIII	4 g/kW-hr
Carbon monoxide	2.57	0.64			40 CFR 60 Subpart IIII	3.5 g/kW-hr
VOC's	2.94	0.73			40 CFR 60 Subpart IIII	4 g/kW-hr

Attach calculation worksheets. Manufacturer specification sheets should be provided if used as the basis for emission estimates. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

11. Applicable Regulations:

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stat. Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stat. Combustion. Turbines
- ☐ 40 CFR 60, Subpart OOOO/OOOOa
- ☑ 40 CFR 63, Subpart ZZZZ, NESHAP for Stat. RICE
- ☑ 40 CFR 60, Subpart IIII, NSPS for Stat. Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stat. Spark Ignition ICE
- ☐ Other: ....

Does this unit have an EPA Certificate of Conformity? ■ Yes ☐ No if yes, please provide: ....

12. Regulatory Standards, Limitations, and Requirements:

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
Filterable PM/PM10	0.20	g/KW-hr	PSD	
NOx	6.4	g/KW-hr	NSPS, Subpart IIII	
VOC	6.4	g/KW-hr	NSPS, Subpart IIII	

3. for federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit, specify either SMS-PSD or SMS- Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? ☐ N/A ■ Yes ☐ No
(if yes, provide a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? ■ Yes ☐ No

13. Pollution Control Information:

A. Device/Technology Type(s)

- ☑ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NOX Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction(SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Diesel Particulate Filter
- ☐ Other ____________
- ☐ Other ____________

B. Control Efficiencies

Pollutant	% Reduction
NO_X	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this item in compliance with all applicable air pollution rules and regulations?

■ Yes ☐ No (if "no", a compliance schedule, ADEM Form 437, must be attached.

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit)

Emission Point & Description: EGEN_2 Stack Type: ____________

Stack UTM Coordinate (E-W)	405.18	(km)	Stack UTM Coordinate (N-S)	3,444.88	(km)
Latitude	31.134	(LAT)	Longitude	-87.995	(LONG)
Height above grade	7.9	(ft)	Gas temperature at exit	852	(ºF)
Inside diameter at exit (round)	0.42	(ft)	Gas Velocity	270.2	(ft/Sec)
Inside area at exit (not round)		(ft^2)	Volume of gas discharged	2,246	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height		(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☐ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☐ No

If yes, provide units: ____________

16. Clarifying/Supplemental Information (Optional):

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: ____________ Date: 3/25/2025

ADEM

SURFACE COATING EMISSION SOURCES ADEM FORM 109

			-					-				

Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Identification Name or Number given to this process: ACL_C1/RTO_1

3. Type of surface coating process:

Coils are coated using rollers that pick up the coating as they rotate and transfer it to the coils. The metal coils are then transferred to an oven where the coatings are baked and cured.

4. Source Classification Code(s): 40201806

5. Briefly describe the operation of this surface coating process in your facility:

A thin coating of a liquid varnish is then applied to the annealed strip and cured. The water-borne coating material are pumped from containers into circulation tanks that feed the roll coater units. The coater units are contained within a closed and climate-controlled coater room with exhaust hoods. The strip passes through the roll coaters, where the liquid varnish is applied to the surface of the strip, and then into the one of the curing ovens. The coating is dried and cured at the required temperature, and the solvents are evaporated. The coated strip is cooled with air, and then passes into the exit section with inspection and measurement of strip quality before being rewound into coils. After passing through the air cooling sections, the strips are sprayed with a cooling quench to complete the cooling prior to further slitting and rewinding.

The curing ovens are heated with direct-fired natural gas burners. The contaminated exhaust air from the curing section and the coater sections is processed through the corresponding Regenerative Thermal Oxidizer (RTO). The RTOs destroy the Volatile Organic Carbon (VOC) and Hazardous Air Pollutants (HAP) by reaction with oxygen at a controlled temperature. The RTOs are equipped with natural gas burners to maintain the required temperature.

6. Typical operating schedule:

Hours/ day: 24 Days/ week: 7 Weeks/ year: 52

Peak production season (if any): N/A

7. Coating material used in unit or process (as applied). Do not include diluents added to coatings (see item 7).

Coating Material	Coating Method	Total gal/hr	Density lbs/gal	% wt Solid	% wt Water	% wt VOC	% wt HAP	VOC's applied lbs/year	HAP's applied lbs/year
C3	Rolled	TBD	8.68	47	36.9	15.7	0	TBD	0
C5	Rolled	TBD	10.68	49.9	39.4	10.7	0	TBD	0
C6	Rolled	TBD	14.94	76	14.5	8.2	0	TBD	0
							Total (lbs/year)	1,795,800	
							Total (tons/year)	897.9	

8. Description of organic liquid diluents (coating thinners & additives) added to the surface coatings:

Diluents	Amt. added per gallon	Coating material	Total gal/yr.	Density lbs/gal	% wt Water	% wt HAP	% wt VOC	HAP's lbs/year	VOC's lbs/year
TBD									
						Total (pounds/year)			
						Total (tons/year)			

9. Description of all organic liquid solvents used for wash or clean up:

Solvents	Total gal/yr.	Density lbs/gal	% wt Water	% wt HAP	% wt VOC	HAP's lbs/year	VOC's lbs/year
TBD							
				Total (pounds/year)			
				Total (tons/year)			

10. After coating, materials are: ■ Oven dried ☐ Air dried ☐ Warm air tunnel dried

If oven or warm air tunnel dried, the total fuel heat input is (exclude fuels used by indirect heating equipment previously described on ADEM Form 104.): 13.88 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

11. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram; attach additional sheets as necessary):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
ACL_C1	Point	☐	405.21	3,444.80	31.133	-87.994	91.57	N/A	48	2.26	N/A	48.59	11,695.13	176
RTO_1	Point	☐	405.21	3,444.81	31.133	-87.994	97.83	N/A	48	2.49	N/A	31.50	9,227.73	536
		☐												
		☐												
		☐												
		☐												
		☐												
		☐												
		☐												

* std temperature is 68ºF - std pressure is 29.92" in hg or 1 atm.
** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any different operating scenarios.

12. Attach a flow diagram to illustrate locations of air contaminant release so that emission points under item 11 can be identified.

13. Is there any emission control equipment on this unit or process?

☒ Yes ☐ No (if "Yes", complete ADEM Form 110)

14. Does this process have particulate filters?

☐ Yes ☒ No

15. Do you operate a coating line located within a permanently installed enclosure that directs all exhaust gases from the enclosure to a control device that meets the criteria of Method 2014 of Appendix M, 40 CFR Part 51?

☒ Yes ☐ No ☐ Not Applicable

16. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE ONLY	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (Provide in lb/hr or other Unit of Measure)
			lb/hr	ton/yr	lb/hr	ton/yr		
ACL_C1	☐	Filterable PM/PM10/PM2.5	0.37	1.60			BACT	1 mg/m3
ACL_C1	☐	VOC	2.4	10.55			BACT	6.6 mg/m3
RTO_1	☐	Filterable PM/PM10			0.03	0.11	AP-42	0.0019 lb/MMBtu
RTO_1	☐	Filterable PM2.5			0.03	0.11	AP-42	0.0019 lb/MMBtu
RTO_1	☐	Condensable PM			0.08	0.34	AP-42	0.0056 lb/MMBtu
RTO_1	☐	SO2			0.01	0.04	AP-42	0.0006 lb/MMBtu
RTO_1	☐	CO			0.54	2.38	Vendor	0.04 lb/MMBtu
RTO_1	☐	NOx			1.15	5.06	BACT	0.083 lb/MMBtu
RTO_1	☐	VOC			2.06	9.03	BACT	0.30 lb/MMBtu
RTO_1	☐	Total HAPs			0.001	0.01	AP-42	N/A

17. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

N/A

18. Are you requesting a limitation for permitting? ☐ Yes ■ No if "yes", specify the limit and affected unit(s):

19. Is this surface coating process in compliance with all applicable air pollution rules and regulations?

■ yes ☐ no (if "no", complete ADEM Form 437)

20. For existing sources only, attach a chronological history of the process, including original installation date, modification date(s), and detailed description of the modification(s).

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

SURFACE COATING EMISSION SOURCES ADEM FORM 109

			-					-				

Do not write in this space

1. Name of facility or organization: AM Calvert, LLC
2. Identification Name or Number given to this process: ACL_C2/RTO_2
3. Type of surface coating process:

   Coils are coated using rollers that pick up the coating as they rotate and transfer it to the coils. The metal coils are then transferred to an oven where the coatings are baked and cured.

4. Source Classification Code(s): 40201806
5. Briefly describe the operation of this surface coating process in your facility:

   A thin coating of a liquid varnish is then applied to the annealed strip and cured. The water-borne coating material are pumped from containers into circulation tanks that feed the roll coater units. The coater units are contained within a closed and climate-controlled coater room with exhaust hoods. The strip passes through the roll coaters, where the liquid varnish is applied to the surface of the strip, and then into the one of the curing ovens. The coating is dried and cured at the required temperature, and the solvents are evaporated. The coated strip is cooled with air, and then passes into the exit section with inspection and measurement of strip quality before being rewound into coils. After passing through the air cooling sections, the strips are sprayed with a cooling quench to complete the cooling prior to further slitting and rewinding.

   The curing ovens are heated with direct-fired natural gas burners. The contaminated exhaust air from the curing section and the coater sections is processed through the corresponding Regenerative Thermal Oxidizer (RTO). The RTOs destroy the Volatile Organic Carbon (VOC) and Hazardous Air Pollutants (HAP) by reaction with oxygen at a controlled temperature. The RTOs are equipped with natural gas burners to maintain the required temperature.

6. Typical operating schedule:

   Hours/ day: 24 Days/ week: 7 Weeks/ year: 52

   Peak production season (if any): N/A

7. Coating material used in unit or process (as applied). Do not include diluents added to coatings (see item 7).

Coating Material	Coating Method	Total gal/hr	Density lbs/gal	% wt Solid	% wt Water	% wt VOC	% wt HAP	VOC's applied lbs/year	HAP's applied lbs/year
C3	Rolled	TBD	8.68	47	36.9	15.7	0	TBD	0
C5	Rolled	TBD	10.68	49.9	39.4	10.7	0	TBD	0
C6	Rolled	TBD	14.94	76	14.5	8.2	0	TBD	0
							Total (lbs/year)	1,795,800	
							Total (tons/year)	897.9	

8. Description of organic liquid diluents (coating thinners & additives) added to the surface coatings:

Diluents	Amt. added per gallon	Coating material	Total gal/yr.	Density lbs/gal	% wt Water	% wt HAP	% wt VOC	HAP's lbs/year	VOC's lbs/year
							Total (pounds/year)		
							Total (tons/year)		

9. Description of all organic liquid solvents used for wash or clean up:

Solvents	Total gal/yr.	Density lbs/gal	% wt Water	% wt HAP	% wt VOC	HAP's lbs/year	VOC's lbs/year
					Total (pounds/year)		
					Total (tons/year)		

10. After coating, materials are: ■ Oven dried ☐ Air dried ☐ Warm air tunnel dried

If oven or warm air tunnel dried, the total fuel heat input is (exclude fuels used by indirect heating equipment previously described on ADEM Form 104.): 13.88 MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

11. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram; attach additional sheets as necessary):

Emission Point	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/ Sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp. (ºF)
			E-W (km)	N-S (km)	LAT	LONG								
ACL_C2	Point	☐	405.23	3,444.79	31.133	-87.994	91.57	N/A	48	2.26	N/A	48.59	11,695.13	176
RTO_2	Point	☐	405.24	3444.80	31.133	-87.994	94.85	N/A	48	2.49	N/A	31.50	9,227.73	536
		☐												
		☐												
		☐												
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* std temperature is 68ºF - std pressure is 29.92" in hg or 1 atm.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any different operating scenarios.

12. Attach a flow diagram to illustrate locations of air contaminant release so that emission points under item 11 can be identified.

13. Is there any emission control equipment on this unit or process?

■ Yes ☐ No (if "Yes", complete ADEM Form 110)

14. Does this process have particulate filters?

☐ Yes ■ No

15. Do you operate a coating line located within a permanently installed enclosure that directs all exhaust gases from the enclosure to a control device that meets the criteria of Method 2014 of Appendix M, 40 CFR Part 51?

■ Yes ☐ No ☐ Not Applicable

16. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE ONLY	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (Provide in lb/hr or other Unit of Measure)
			lb/hr	ton/yr	lb/hr	ton/yr		
ACL_C2	☐	Filterable PM/PM10/PM2.5	0.37	1.60			BACT	1 mg/m3
ACL_C2	☐	VOC	2.4	10.55			BACT	6.6 mg/m3
RTO_2	☐	Filterable PM/PM10			0.03	0.11	AP-42	0.0019 lb/MMBtu
RTO_2	☐	Filterable PM2.5			0.03	0.11	AP-42	0.0019 lb/MMBtu
RTO_2	☐	Condensable PM			0.08	0.34	AP-42	0.0056 lb/MMBtu
RTO_2	☐	SO2			0.01	0.04	AP-42	0.0006 lb/MMBtu
RTO_2	☐	CO			0.54	2.38	Vendor	0.04 lb/MMBtu
RTO_2	☐	NOx			1.15	5.06	BACT	0.083 lb/MMBtu
RTO_2	☐	VOC			2.06	9.03	BACT	0.30 lb/MMBtu
RTO_2	☐	Total HAPs			0.001	0.01	AP-42	N/A

17. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

N/A

18. Are you requesting a limitation for permitting? ☐ Yes ☒ No if "yes", specify the limit and affected unit(s):

19. Is this surface coating process in compliance with all applicable air pollution rules and regulations?

☒ yes ☐ no (if "no", complete ADEM Form 437)

20. For existing sources only, attach a chronological history of the process, including original installation date, modification date(s), and detailed description of the modification(s).

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☒ Wet scrubber (kind): Water
- ☐ Other (describe):

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Pickling Line

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	HCL
Mass emission rate (#/hr)			
Uncontrolled	10	10	30
Designed..	0.20	0.19	0.60
Manufacturer's guaranteed	0.001 gr/dscf	0.001 gr/dscf	6 ppm
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.001 gr/dscf	0.001 gr/dscf	6 ppm
Manufacturer's guaranteed	0.001 gr/dscf	0.001 gr/dscf	6 ppm
Removal efficiency (%)			
Designed...	98	98	98
Manufacturer's guaranteed	98	98	98

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	23,963.97		23,963.97
Temperature (ºF)	212		212
Velocity (ft/sec)	32.81		32.81
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: PICKL, Pickling Line Scrubber   Stack Type: Point

Stack UTM Coordinate (E-W)	405.06	(km)	Stack UTM Coordinate (N-S)	3,444.67	(km)
Latitude	31.132	(LAT)	Longitude	-87.995	(LONG)
Height above grade	88.00	(ft)	Gas temperature at exit	212	(ºF)
Inside diameter at exit (round)	3.94	(ft)	Gas Velocity	32.81	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	23,963.97	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ■ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ■ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints   ☐ Particle size distribution report

☐ Manufacturer's literature   ☐ Size efficiency- curves

☐ Emissions test of existing installation   ☐ Fan curves

☐ Other ________________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Scrubber makeup water flow rate; pressure drop

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume			TBD	
Composition			TBD	
Is waste hazardous?			No	
Method of disposal			TBD	
Final destination			TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____
- ☐ Other (describe): ____
- ☐ Electrostatic precipitator
- ☒ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Oxide Storage Bins

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	17	16	
Designed	0.17	0.16	
Manufacturer's guaranteed	0.17	0.16	
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.0061 gr/dscf	0.0058 gr/dscf	
Manufacturer's guaranteed	0.0061 gr/dscf	0.0058 gr/dscf	
Removal efficiency (%)			
Designed	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	4,238.75		4,238.75
Temperature (ºF)	185		185
Velocity (ft/sec)	64.6		64.6
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: OXIDE; Oxide Storage Bins Baghouse

Stack Type: Point

Stack UTM Coordinate (E-W)	405.0	(km)	Stack UTM Coordinate (N-S)	3444.65	(km)
Latitude	31.13	(LAT)	Longitude	-88.0	(LONG)
Height above grade	100	(ft)	Gas temperature at exit	185	(ºF)
Inside diameter at exit (round)	1.18	(ft)	Gas Velocity	64.6	(ft/Sec)
Inside area at exit (not round)		(ft^2)	Volume of gas discharged	4,238.75	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height		(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ■ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ■ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report

☐ Manufacturer's literature ☐ Size efficiency- curves

☐ Emissions test of existing installation ☐ Fan curves

☐ Other ____________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

air/cloth ratio and fabric type, weight, and weave

12. By-pass (if any) is to be used and when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD			
Composition	TBD			
Is waste hazardous?	No			
Method of disposal	TBD			
Final destination	TBD			

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☒ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ________
- ☐ Other (describe): ________

3. Control device manufacturer's information:

Name of manufacturer: TBD Model No.: TBD

1. Emission source(s) to which device is installed or is to be installed:

Shot Blaster

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Total PM	Filterable PM10	Filterable PM2.5
Mass emission rate (#/hr)			
Uncontrolled	67	10	1
Designed...	0.67	0.10	0.01
Manufacturer's guaranteed	0.67	0.10	0.01
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.003 gr/dscf	0.0004 gr/dscf	0.00004 gr/dscf
Manufacturer's guaranteed	0.003 gr/dscf	0.0004 gr/dscf	0.00004 gr/dscf
Removal efficiency (%)			
Designed..	99	99	99
Manufacturer's guaranteed	99	99	99

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	28,124.38		28,124.38
Temperature (ºF)	212		212
Velocity (ft/sec)	32.81		32.81
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: SHOT_B, Shot Blaster Baghouse　　Stack Type: Point

Stack UTM Coordinate (E-W)	405.1002 (km)	Stack UTM Coordinate (N-S)	3444.739 (km)
Latitude	31.13 (LAT)	Longitude	-87.99 (LONG)
Height above grade	94.85 (ft)	Gas temperature at exit	212 (ºF)
Inside diameter at exit (round)	4.27 (ft)	Gas Velocity	32.81 (ft/Sec)
Inside area at exit (not round)	____ (ft^2)	Volume of gas discharged	28,124.38 (ACFM)
Base Elevation	48 (ft)	GEP Stack Height	____ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints　☐ Particle size distribution report

☐ Manufacturer's literature　☐ Size efficiency- curves

☐ Emissions test of existing installation　☐ Fan curves

☐ Other ______________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

air/cloth ratio and fabric type, weight, and weave

12. By-pass (if any) is to be used and when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD			
Composition	TBD			
Is waste hazardous?	No			
Method of disposal	TBD			
Final destination	TBD			

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: Jeff H Twaddle Date: 3/25/2025

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☒ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____________________
- ☐ Other (describe): ____________________

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Cold Rolling Mill 1

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	229	149	
Designed..	2.29	1.49	
Manufacturer's guaranteed	0.0026 gr/dscf	65% PM10	
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.0026 gr/dscf	65% PM10	
Manufacturer's guaranteed	0.0026 gr/dscf	65% PM10	
Removal efficiency (%)			
Designed...	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	105,944		105,944
Temperature (ºF)	68		68
Velocity (ft/sec)	34.45		34.45
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: CRM_1, Cold Rolling Mill 1 Stack Type: ____________

Stack UTM Coordinate (E-W) 404.952 (km) Stack UTM Coordinate (N-S) 3444.544 (km)

Latitude 31.1309 (LAT) Longitude -87.9969 (LONG)

Height above grade 173.89 (ft) Gas temperature at exit 68 (ºF)

Inside diameter at exit (round) 8.20 Inside (ft) Gas Velocity 34.45 (ft/Sec)

area at exit (not round) ________ (ft^2) Volume of gas discharged 105,944 (ACFM)

Base Elevation 48 (ft) GEP Stack Height ________ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report

☐ Manufacturer's literature ☐ Size efficiency- curves

☐ Emissions test of existing installation ☐ Fan curves

☐ Other ______________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Temperature differential

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume			TBD	
Composition			TBD	
Is waste hazardous?			No	
Method of disposal			TBD	
Final destination			TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☒ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____________________
- ☐ Other (describe): ____________________

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Cold Rolling Mill 2

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	229	149	
Designed...	2.29	1.49	
Manufacturer's guaranteed	0.0026 gr/dscf	65% PM10	
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.0026 gr/dscf	65% PM10	
Manufacturer's guaranteed	0.0026 gr/dscf	65% PM10	
Removal efficiency (%)			
Designed...	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	105,944		105,944
Temperature (ºF)	68		68
Velocity (ft/sec)	34.45		34.45
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: CRM_2, Cold Rolling Mill 2 Stack Type: ____________

Stack UTM Coordinate (E-W) 405.014 (km) Stack UTM Coordinate (N-S) 3444.511 (km)

Latitude 31.1306 (LAT) Longitude -87.9963 (LONG)

Height above grade 173.89 (ft) Gas temperature at exit 68 (ºF)

Inside diameter at exit (round) 8.20 Inside (ft) Gas Velocity 34.45 (ft/Sec)

area at exit (not round) ________ (ft^2) Volume of gas discharged 105,944 (ACFM)

Base Elevation 48 (ft) GEP Stack Height ________ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report

☐ Manufacturer's literature ☐ Size efficiency- curves

☐ Emissions test of existing installation ☐ Fan curves

☐ Other ____________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Temperature differential

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume			TBD	
Composition			TBD	
Is waste hazardous?			No	
Method of disposal			TBD	
Final destination			TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____
- ☒ Other (describe): Mist Eliminator

3. Control device manufacturer's information:

Name of manufacturer: TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Cold Rolling Mill 1

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	4	4	
Designed.....................	0.04	0.04	
Manufacturer's guaranteed	0.0026 gr/dscf	0.0026 gr/dscf	
Mass emission rate (Expressed as units of standard)			
Required by regulation.....................	0.0026 gr/dscf	0.0026 gr/dscf	
Manufacturer's guaranteed	0.0026 gr/dscf	0.0026 gr/dscf	
Removal efficiency (%)			
Designed.....................	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	109,210.79		109,210.79
Temperature (ºF)	68		68
Velocity (ft/sec)	34.45		34.45
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: CRM_1, Cold Rolling Mill 1   Stack Type: ____________

Stack UTM Coordinate (E-W)	404.952	(km)	Stack UTM Coordinate (N-S)	3444.544	(km)
Latitude	31.1309	(LAT)	Longitude	-87.9969	(LONG)
Height above grade	104.99	(ft)	Gas temperature at exit	68	(ºF)
Inside diameter at exit (round)	8.20	(ft)	Gas Velocity	34.45	(ft/Sec)
Inside area at exit (not round)		(ft^2)	Volume of gas discharged	109,210.7	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height		(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☒ Other ____________
- ☐ Particle size distribution report
- ☐ Size efficiency- curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Gas velocity

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		TBD	
Composition	TBD		TBD	
Is waste hazardous?	No		No	
Method of disposal	TBD		TBD	
Final destination	TBD		TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind):
- ☒ Other (describe): Mist Eliminator

3. Control device manufacturer's information:

Name of manufacturer: TBD   Model No.: TBD

1. Emission source(s) to which device is installed or is to be installed:

Cold Rolling Mill 2

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	4	4	
Designed...	0.04	0.04	
Manufacturer's guaranteed	0.0026 gr/dscf	0.0026 gr/dscf	
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.0026 gr/dscf	0.0026 gr/dscf	
Manufacturer's guaranteed	0.0026 gr/dscf	0.0026 gr/dscf	
Removal efficiency (%)			
Designed...	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	109,210.79		109,210.79
Temperature (ºF)	68		68
Velocity (ft/sec)	34.45		34.45
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: CRM_2, Cold Rolling Mill 2 Stack Type: ____________

Stack UTM Coordinate (E-W)	405.014	(km)	Stack UTM Coordinate (N-S)	3444.511	(km)
Latitude	31.1306	(LAT)	Longitude	-87.9963	(LONG)
Height above grade	104.99	(ft)	Gas temperature at exit	68	(ºF)
Inside diameter at exit (round)	8.20	(ft)	Gas Velocity	34.45	(ft/Sec)
Inside area at exit (not round)		(ft^2)	Volume of gas discharged	109,210.7	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height		(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report
☐ Manufacturer's literature ☐ Size efficiency- curves
☐ Emissions test of existing installation ☐ Fan curves
☒ Other ____

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Gas velocity

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		TBD	
Composition	TBD		TBD	
Is waste hazardous?	No		No	
Method of disposal	TBD		TBD	
Final destination	TBD		TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☒ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____
- ☐ Other (describe): ____
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Oven 1 + Roll Coat Station

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	VOC		
Mass emission rate (#/hr)			
Uncontrolled	205		
Designed...	2.05		
Manufacturer's guaranteed	2.05		
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................			
Manufacturer's guaranteed			
Removal efficiency (%)			
Designed..	99		
Manufacturer's guaranteed			

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	9,227.73		9,227.73
Temperature (ºF)	536		536
Velocity (ft/sec)	31.496		31.496
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: RTO_1, Curing Oven 1 + RTO 1 Stack Type: Point

Stack UTM Coordinate (E-W)	405.19	(km)	Stack UTM Coordinate (N-S)	3,444.83	(km)
Latitude	31.134	(LAT)	Longitude	-87.995	(LONG)
Height above grade	97.83	(ft)	Gas temperature at exit	536	(ºF)
Inside diameter at exit (round)	2.49	(ft)	Gas Velocity	31.496	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	9,227.73	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☐Yes ☐No :

Is this a merged stack (do multiple units use this release point)? ☐Yes ☐No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐Blueprints ☐Particle size distribution report

☐Manufacturer's literature ☐Size efficiency- curves

☐Emissions test of existing installation ☐Fan curves

☐Other ______________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Air flow, temperature, pollutant loading

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

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PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☒ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____
- ☐ Other (describe): ____
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Oven 2 + Roll Coat Station

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	VOC		
Mass emission rate (#/hr)			
Uncontrolled	205		
Designed..	2.05		
Manufacturer's guaranteed	2.05		
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................			
Manufacturer's guaranteed			
Removal efficiency (%)			
Designed...	99		
Manufacturer's guaranteed			

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	9,227.73		9,227.73
Temperature (ºF)	536		536
Velocity (ft/sec)	31.496		31.496
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: RTO_2, Curing Oven 2 + RTO 2 Stack Type: Point

Stack UTM Coordinate (E-W)	405.22 (km)	Stack UTM Coordinate (N-S)	3,444.81 (km)
Latitude	31.133 (LAT)	Longitude	-87.994 (LONG)
Height above grade	97.83 (ft)	Gas temperature at exit	536 (ºF)
Inside diameter at exit (round)	2.49 (ft)	Gas Velocity	31.496 (ft/Sec)
Inside area at exit (not round)	N/A (ft^2)	Volume of gas discharged	9,227.73 (ACFM)
Base Elevation	48 (ft)	GEP Stack Height	N/A (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

- ☐ Blueprints
- ☐ Particle size distribution report
- ☐ Manufacturer's literature
- ☐ Size efficiency- curves
- ☐ Emissions test of existing installation
- ☐ Fan curves
- ☐ Other ______________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Air flow, temperature, pollutant loading

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization: AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____
- ☒ Other (describe): Selective Catalyic Reduction

3. Control device manufacturer's information:

Name of manufacturer: TBD Model No.: TBD

1. Emission source(s) to which device is installed or is to be installed:

Annealing Furnace

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled	15.6		
Designed...	4.68		
Manufacturer's guaranteed	4.68		
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.05 lb/MMBtu		
Manufacturer's guaranteed	0.05 lb/MMBtu		
Removal efficiency (%)			
Designed..	70		
Manufacturer's guaranteed			

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	80,545.56		80,545.56
Temperature (ºF)	572		572
Velocity (ft/sec)	32.81		32.81
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: ANNEAL1, Annealing Furnace   Stack Type: ____________

Stack UTM Coordinate (E-W)	405.16	(km)	Stack UTM Coordinate (N-S)	3,444.84	(km)
Latitude	31.1336	(LAT)	Longitude	-87.9948	(LONG)
Height above grade	124.38	(ft)	Gas temperature at exit	572	(ºF)
Inside diameter at exit (round)	7.22	(ft)	Gas Velocity	32.81	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	80,545.56	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints
☐ Manufacturer's literature
☐ Emissions test of existing installation
☒ Other ____________
☐ Particle size distribution report
☐ Size efficiency- curves
☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Catalyst inlet temperature, reductant injection rate

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer: Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☒ Wet scrubber (kind): TBD
- ☐ Other (describe):

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Spray Roaster

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	2.33	2.33	
Designed...	0.07	0.07	
Manufacturer's guaranteed	0.07	0.07	
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.07 lb/hr	0.07 lb/hr	
Manufacturer's guaranteed	0.07 lb/hr	0.07 lb/hr	
Removal efficiency (%)			
Designed..	97	97	
Manufacturer's guaranteed	97	97	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	2,080.21		2,080.21
Temperature (ºF)	149		149
Velocity (ft/sec)	16.40		16.40
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: SPRY_R, Spray Roaster   Stack Type: Point

Stack UTM Coordinate (E-W)	405.01	(km)	Stack UTM Coordinate (N-S)	3,444.671	(km)
Latitude	31.1321	(LAT)	Longitude	-87.9963	(LONG)
Height above grade	150	(ft)	Gas temperature at exit	149	(ºF)
Inside diameter at exit (round)	1.64	(ft)	Gas Velocity	16.40	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	2,080.21	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other ______________________________
- ☐ Particle size distribution report
- ☐ Size efficiency- curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Scrubber makeup water flow rate; pressure drop

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume			TBD	
Composition			TBD	
Is waste hazardous?			TBD	
Method of disposal			TBD	
Final destination			TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Thermal Oxidizer
- ☒ Wet scrubber (kind): Water
- ☐ Other (describe):
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TYBD

1. Emission source(s) to which device is installed or is to be installed:

Tank Farm

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM/PM10/PM2.5	HCI	CL2
Mass emission rate (#/hr)			
Uncontrolled	12	92	90
Designed..	0.12	0.92	0.90
Manufacturer's guaranteed	0.12	0.92	0.90
Mass emission rate (Expressed as units of standard)			
Required by regulation................................	0.001 gr/dscf	12 ppm	6 ppm
Manufacturer's guaranteed	0.001 gr/dscf	12 ppm	6 ppm
Removal efficiency (%)			
Designed..	99	99	99
Manufacturer's guaranteed	99	99	99

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	13,407.15		13,407.15
Temperature (ºF)	185		185
Velocity (ft/sec)	64.60		64.60
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: TNK_FM , Tank Farm Scrubber Stack Type: Point

Stack UTM Coordinate (E-W) 405.00 (km) Stack UTM Coordinate (N-S) 3,444.65 (km)

Latitude 31.1319 (LAT) Longitude -87.9966 (LONG)

Height above grade 81.99 (ft) Gas temperature at exit 176 (ºF)

Inside diameter at exit (round) 1.84 (ft) Gas Velocity 84.28 (ft/Sec)

Inside area at exit (not round) N/A (ft^2) Volume of gas discharged 13,407.15 (ACFM)

Base Elevation 48 (ft) GEP Stack Height N/A (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report

☐ Manufacturer's literature ☐ Size efficiency- curves

☐ Emissions test of existing installation ☐ Fan curves

☐ Other ____________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Scrubber makeup water flow rate; pressure drop

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume			TBD	
Composition			TBD	
Is waste hazardous?			No	
Method of disposal			TBD	
Final destination			TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

☐ Settling chamber
☐ Afterburner
☐ Cyclone
☐ Absorber
☐ Condenser
☐ Thermal Oxidizer
☐ Wet scrubber (kind): ______
☒ Other (describe): Mist Eliminator
☐ Electrostatic precipitator
☐ Baghouse
☐ Multiclone
☐ Adsorber
☐ Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Annealing and Coating Line Cleaning Section 1

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	38	38	
Designed..	0.38	0.38	
Manufacturer's guaranteed	0.003 gr/dscf	0.003 gr/dscf	
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.003 gr/dscf	0.003 gr/dscf	
Manufacturer's guaranteed	0.003 gr/dscf	0.003 gr/dscf	
Removal efficiency (%)			
Designed..	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	14,800.25		14,800.25
Temperature (ºF)	167		167
Velocity (ft/sec)	49.21		49.21
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: CLEAN_1, ACL Cleaning Section 1 Stack Type: Point

Stack UTM Coordinate (E-W) 405.07 (km) Stack UTM Coordinate (N-S) 3,444.60 (km)

Latitude 31.1306 (LAT) Longitude -87.9963 (LONG)

Height above grade 97.83 (ft) Gas temperature at exit 167 (ºF)

Inside diameter at exit (round) 2.53 (ft) Gas Velocity 49.21 (ft/Sec)

Inside area at exit (not round) N/A (ft^2) Volume of gas discharged 14,800.25 (ACFM)

Base Elevation 48 (ft) GEP Stack Height N/A (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report

☐ Manufacturer's literature ☐ Size efficiency- curves

☐ Emissions test of existing installation ☐ Fan curves

☒ Other ______________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Gas velocity

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		TBD	
Composition	TBD		TBD	
Is waste hazardous?	No		No	
Method of disposal	TBD		TBD	
Final destination	TBD		TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ______
- ■ Other (describe): Mist Eliminator
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Annealing and Coating Line Cleaning Section 2

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	38	38	
Designed...	0.38	0.38	
Manufacturer's guaranteed	0.38	0.38	
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.003 gr/dscf	0.003 gr/dscf	
Manufacturer's guaranteed	0.003 gr/dscf	0.003 gr/dscf	
Removal efficiency (%)			
Designed...	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	14,800.25		14,800.25
Temperature (ºF)	167		167
Velocity (ft/sec)	49.21		49.21
Percent moisture			

Pressure drop across device: ____________ (inches $H_2$0)

7. Stack dimensions:

Stack No. & Description: CLEAN_2, ACL Cleaning Section 2 Stack Type: Point

Stack UTM Coordinate (E-W)	405.06	(km)	Stack UTM Coordinate (N-S)	3,444.58	(km)
Latitude	31.1313	(LAT)	Longitude	-87.9954	(LONG)
Height above grade	97.83	(ft)	Gas temperature at exit	167	(ºF)
Inside diameter at exit (round)	2.53	(ft)	Gas Velocity	49.21	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	14,800.25	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report
☐ Manufacturer's literature ☐ Size efficiency- curves
☐ Emissions test of existing installation ☐ Fan curves
☒ Other ______________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Gas velocity

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		TBD	
Composition	TBD		TBD	
Is waste hazardous?	No		No	
Method of disposal	TBD		TBD	
Final destination	TBD		TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

Do not write in this space

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2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____________
- ☒ Other (describe): Mist Eliminator

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Annealing and Coating Line 1 Quenching Section

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	11	0.04	
Designed..	0.11	0.0004	
Manufacturer's guaranteed	0.11 lb/hr	0.0004 lb/hr	
Mass emission rate (Expressed as units of standard)			
Required by regulation.......................................	0.11 lb/hr	0.0004 lb/hr	
Manufacturer's guaranteed	0.11 lb/hr	0.0004 lb/hr	
Removal efficiency (%)			
Designed...	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	102,965.68		102,965.68
Temperature (ºF)	132.8		132.8
Velocity (ft/sec)	46.03		46.03
Percent moisture			

Pressure drop across device: ____________ (inches $H_2$0)

7. Stack dimensions:

Stack No. & Description: QUEN_1, ACL 1 Quench Section   Stack Type: Point

Stack UTM Coordinate (E-W)	405.23	(km)	Stack UTM Coordinate (N-S)	3,444.83	(km)
Latitude	31.134	(LAT)	Longitude	-87.994	(LONG)
Height above grade	91.57	(ft)	Gas temperature at exit	132.8	(ºF)
Inside diameter at exit (round)	6.89	(ft)	Gas Velocity	46.03	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	102,965.6	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report

☐ Manufacturer's literature ☐ Size efficiency- curves

☐ Emissions test of existing installation ☐ Fan curves

☒ Other ________________________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Gas velocity

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		TBD	
Composition	TBD		TBD	
Is waste hazardous?	No		No	
Method of disposal	TBD		TBD	
Final destination	TBD		TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: Date: 3/25/2025

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization AM Calvert, LLC

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____
- ■ Other (describe): Mist Eliminator

3. Control device manufacturer's information:

Name of manufacturer TBD Model No. TBD

1. Emission source(s) to which device is installed or is to be installed:

Annealing and Coating Line 2 Quenching Section

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Filterable PM/PM10	Filterable PM2.5	
Mass emission rate (#/hr)			
Uncontrolled	11	0.04	
Designed........	0.11	0.0004	
Manufacturer's guaranteed	0.11 lb/hr	0.0004 lb/hr	
Mass emission rate (Expressed as units of standard)			
Required by regulation........	0.11 lb/hr	0.0004 lb/hr	
Manufacturer's guaranteed	0.11 lb/hr	0.0004 lb/hr	
Removal efficiency (%)			
Designed........	99	99	
Manufacturer's guaranteed	99	99	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	102,965.68		102,965.68
Temperature (ºF)	132.8		132.8
Velocity (ft/sec)	46.03		46.03
Percent moisture			

Pressure drop across device: ____________ (inches H_2O)

7. Stack dimensions:

Stack No. & Description: QUEN_2, ACL 2 Quench Section   Stack Type: Point

Stack UTM Coordinate (E-W)	405.25	(km)	Stack UTM Coordinate (N-S)	3,444.79	(km)
Latitude	31.134	(LAT)	Longitude	-87.994	(LONG)
Height above grade	91.57	(ft)	Gas temperature at exit	132.8	(ºF)
Inside diameter at exit (round)	6.89	(ft)	Gas Velocity	46.03	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	102,965.6	(ACFM)
Base Elevation	48	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☐ Yes ☒ No

If yes, provide units:

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints
☐ Manufacturer's literature
☐ Emissions test of existing installation
☒ Other ________________________________
☐ Particle size distribution report
☐ Size efficiency- curves
☐ Fan curves

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11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Gas velocity

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		TBD	
Composition	TBD		TBD	
Is waste hazardous?	No		No	
Method of disposal	TBD		TBD	
Final destination	TBD		TBD	

If collected air pollutants are recycled, describe:

Name of person preparing application: Jeff Twaddle

Company of preparer Environmental Resources Management, Inc.

Signature: [signature] Date: 3/25/2025

APPENDIX D BACT ANALYSIS

Appendix D Best Achievable Control Technology (BACT) Analysis

PREPARED FOR
Arcelor Mittal Calvert, LLC

DATE
4 February 2025

REFERENCE
0721801

SIGNATURE PAGE

Appendix D Best Achievable Control Technology (BACT) Analysis

0721801

Jeff Twaddle
Partner

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LIST OF TABLES

1. BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

A case-by-case Best Available Control Technology (BACT) analysis was performed as required by Alabama Administrative Code (AAC) 335-3-14-.04(9)(b). As discussed in the permit application report, the net emissions increase will exceed significant emission rate thresholds for PSD permitting. PSD review is required for the following pollutants: PM, PM_{10}, $PM_{2.5}$, NO_x, VOC, and GHG.

The project related sources subject to BACT evaluation includes the new equipment proposed as a result of the proposed project. The state has adopted the BACT requirement contained in 40 CFR 52.21(j)(3):

> *A major modification shall apply best available control technology for each regulated NSR pollutant for which it would result in a significant net emissions increase at the source. This requirement applies to each proposed emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit.*

The new sources for which BACT is being addressed are as follows:

- Two (2) Cold Rolling Mill – Fume Exhaust;
- One (1) Annealing Furnace;
- One (1) Shot Blaster;
- One (1) Pickling Line;
- One (1) Tank Farm;
- One (1) Iron Oxide Bin with Bagfilters;
- One (1) Spray Roaster;
- Two (2) Anneal and Coating Line – Cleaning Sections;
- Two (2) Ovens;
- One (1) Cooling Tower;
- Two (2) Emergency Generators;
- Two (2) Boilers;
- One (1) ACL Cooling Section;
- One (1) Quenching Section; and
- One (1) Hydrogen Purging.

1.1 BACT ANALYSIS GUIDELINES

BACT is defined in AAC 335-3-14-.04(2)(1), adopted from 40 CFR Part 52.21(b)(12), as the following:

> *Best Available Control Technology (BACT) shall mean an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the Director, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61.[primary BACT definition]*
>
> *If the Director determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice, or operation and shall provide for compliance by means which achieve equivalent results.[allowance for secondary BACT standard under certain conditions]*

Federal guidance on BACT requires an evaluation that follows a “top down” process. In this approach, the applicant identifies the best-controlled similar source on the basis of controls required by regulation or permit, or controls achieved in practice. The highest level of control is then evaluated for technical feasibility.

The five basic steps of a top-down BACT analysis are listed below:

Step 1: Identify potential control technologies;

Step 2: Eliminate technically infeasible options;

Step 3: Rank remaining control technologies by control effectiveness;

Step 4: Evaluate the most effective controls and document results; and

Step 5: Select BACT.

1.1.1 KEY STEPS IN A TOP-DOWN BACT ANALYSIS

The key steps in a top-down BACT analysis are outlined in the New Source Review Workshop Manual[1] issued by the United States Environmental Protection Agency (USEPA) in 1990. The process follows these steps.

Step One - Available Control Options

The first step is to identify potentially "available" control options for each emission unit and for each pollutant under review. Available options should consist of a comprehensive list of those technologies with a potentially practical application to the emissions unit in question. The list should include Reasonably Available Control Technology (RACT), Best Available Control Technology, Lowest Achievable Emission Rate (LAER) technologies, innovative technologies, and controls applied to similar source categories.

For this analysis, the following information sources were researched:

- USEPA's New Source Review (NSR) website;
- USEPA's RACT/BACT/LAER Clearinghouse (RBLC) database;
- Federal and State Air Quality Permits;
- Technical books and articles;
- In-house experts;
- Vendor quotes and communications with control device equipment manufacturers;
- Guidance documents (referenced herein); and
- Proposed and existing NSPS and NESHAP, including Maximum Achievable Control Technology (MACT).

Step Two - Technical Feasibility

The second step is to eliminate technically infeasible options from further consideration. To be considered feasible, a technology must be both available and applicable. It is important in this step that any presentation of a technical argument for eliminating a technology from further consideration be clearly documented based on physical, chemical, engineering, and source-specific factors related to safe and successful use of the controls.

Step Three - Rank Options by Control Effectiveness

The third step is to rank the technologies not eliminated in Step Two in order of descending control effectiveness for each pollutant of concern. If the highest ranked technology is proposed as BACT, it is not necessary to perform any further technical or economic evaluation, except for the environmental analyses.

Step Four - Evaluate Effectiveness of Controls and Achievability of Emission Limits

The fourth step entails an evaluation of energy, environmental, and economic impacts for determining a final level of control. The evaluation begins with the most stringent control option

1 *New Source Review Workshop Manual Prevention of Significant Deterioration and Nonattainment Area Permitting*, EPA, Draft October 1990.

and continues until a technology under consideration cannot be eliminated based on adverse energy, environmental, or economic impacts. The economic or "cost-effectiveness" analysis is conducted in a manner consistent with USEPA's Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual, Sixth Edition[2] and subsequent revisions.

Step Five - Select BACT

The fifth and final step is to select as BACT the most effective of the remaining technologies under consideration for each pollutant of concern. BACT must, at a minimum, be no less stringent than the level of control required by any applicable NSPS and NESHAP or State regulatory standards applicable to the emission units included in the PSD permit application.

This BACT analysis provides background information on potential control technologies, a summary of technology determinations contained in the RBLC database for similar emission units, a discussion of other potential control options that may be applicable to the emission units, and proposed BACT emission limits.

1.1.2 RBLC SUMMARY

Summaries of applicable BACT determinations from the RBLC for steel recycling mills are included throughout this analysis. The RBLC query included the following processes:

- Process Type No. 81.290 – Other Steel Manufacturing Processes;
- Process Type No. 17.110 – Large Internal Combustion Engines (>500 HP) – Fuel Oil; and
- Process Type No. 99.001 – Abrasive Blasting.

To fully evaluate applicable BACT limits for processes with limited RBLC results, based on process type queries, additional RBLC queries were conducted based on process names or key words (e.g., "vacuum tank degasser").

1.2 BACT DETERMINATION

1.2.1 BACT DETERMINATION FOR COLD ROLLING MILL – FUME EXHAUST

This section evaluates BACT for the new cold rolling mill – fume exhaust being proposed by this project.

Cold Rolling Mill – Fume Exhaust

The annealed and pickled coils are rolled at the Reversing Cold Rolling Mill (RCM) to reduce the strip to the final substrate thickness for the end product. The RCM is a single stand mill in which force is applied to the strip by rolls with hydraulic control to reduce thickness. The strip is in tension between two reels and is rolled in successive passes, alternating in the forward and reverse direction, until the final thickness is achieved. Oil-water emulsion spray equipment is used to lubricate the roll gap and cool the work roll barrel while maintaining control of the strip temperature profile. The emulsion system is a closed loop to collect, filter, and recirculate used emulsion. A strip blow-off drying system removes emulsion drops from the finished strip. The mill

[2] *EPA Air Pollution Control Cost Manual, Sixth Edition*, EPA/452/B-02-001, Research Triangle Park, NC: Office of Air Quality Planning and Standards, January 2002.

is enclosed with fume exhaust hoods over the mill and tension reels. The exhaust oil mists and fumes are conveyed from the hoods to the mist elimination system with condenser unit before venting.

1.2.1.1 COLD ROLLING MILL – FUME EXHAUST PM/PM10/$PM_{2.5}$ BACT

The cold rolling mill – fume exhaust has the potential to emit PM/PM_{10}/$PM_{2.5}$ emissions.

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the cold rolling mill – fume exhaust was developed.

TABLE 1-1 POTENTIAL CONTROL DEVICES

Control Type	Estimated PM/PM10/$PM_{2.5}$ Control Efficiency
High efficiency cyclone	80-99% for PM, 30-90% for PM10, 0-40% for PM2.5 (>0.01 gr/dscf)
Wet scrubber or high efficiency Venturi scrubber	70-99% (~0.01 gr/dscf)
Mist eliminator	70-99%
Condenser	50-99%

Each of the potentially applicable controls is described below.

- ***High Efficiency Cyclones***[3] – This type of particulate control technology (such as a cyclone) is typically utilized to remove large particles (greater than 8 to 10 microns [μm] in aerodynamic diameter) through centrifugal and inertial forces induced by mechanically accelerating the particle-laden gas stream. This type of control is not effective in removing small particles – achieving approximately 30% control efficiency for PM_{10}.
- ***Wet Scrubbers***[4, 5] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing PM_{10}/$PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers

3 Air Pollution Control Technology Fact Sheet: Cyclones, EPA- 452/F-03-005, Washington, D.C.: Clean Air Technology Center, July 2003.

4 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003.

5 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.

- ***Mist Eliminators*[6] -** Fiber-bed scrubbers or mist eliminators are capable of control efficiencies ranging from 70% to 99%, depending on exhaust stream characteristics and size of aerosols. Insoluble PM will clog the fiber-bed filter over time; therefore, fiber-bed filters have a limited commercial acceptance for dust collection. Fiber-bed scrubbers can treat exhaust streams with flow rates ranging from 1,000 scfm to 100,000 scfm and temperatures up to 140°F. For mist eliminators to be considered effective at reducing PM/PM_{10}/$PM_{2.5}$ emissions, the inlet loading must be at least 0.1 gr/dscf.
- ***Condensers*[7] -** Condensers are capable of control efficiencies ranging from 50% to 99%, depending on temperature and system design. The destruction removal efficiency (DRE) is limited by the amount of organic vapor that escapes with the exhaust from the condenser. That amount is determined by the vapor pressure of the condensed liquid and the amount of air present in the emission stream.

Step 2 – Eliminate Technically Infeasible Control Technologies

High Efficiency Cyclone

In addition to the fact that high efficiency cyclones are typically used to remove larger particles, no BACT determinations for cold rolling mill were found that include the use of high efficiency cyclones or mechanical collectors, so this type of control is considered technically infeasible for removing fine PM emissions. Mechanical collectors are used primarily for pretreatment control devices and are not considered a “best” available control technology; for these reasons, this control technology is eliminated from further consideration.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Mist eliminators
2. Wet Scrubber, 70% – 99% (~ 0.01 gr/dscf)
3. Condensers, 50-99%

Step 4 – Evaluate the Most Effective Controls and Document Results

Mist eliminators remove between 70% and 99% of the liquid droplets from the waste gas stream. There are two basic designs, chevron, and mesh pad mist eliminators. The droplets collect and coalesce on the chevron blades or mesh. When the droplets become large enough, they fall by gravity or capillary action. All mist eliminators require periodic washing to remove buildup of PM. Mist eliminators are used to remove large condensed droplet from a gas stream and will be considered for mist control in this BACT evaluation.

The exhaust stream is already wet; therefore, a wet scrubber would introduce additional water usage. For this reason, wet scrubbers are less preferrable BACT than mist eliminators.

---

6 Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

7 EPA Technical Bulletin: Refrigerated Condensers for Control of Organic Air Emissions, EPA-456/R-01-004, Research Triangle Park, NC: Clean Air Technology Center, December 2001.

Condensers have a potential control efficiency between 50% and 99%. Condensers can be used in conjunction with other control devices.

Step 5 – Select BACT

AMC proposes BACT as a combination of mist eliminators and a condensing unit with a limit of 0.0026 gr/dscf to reduce $PM/PM_{10}/PM_{2.5}$ emissions for this source. These particulate emissions are measured as droplets. Testing will not differentiate between PM,PM_{10}, and $PM_{2.5}$, therefore $PM/PM_{10}/PM_{2.5}$ emissions are proposed with the conservative limit of 0.0026 gr/dscf. This limit is equivalent to filterable $PM/PM_{10}/PM_{2.5}$ emissions of 0.04 lb/hr.

1.2.2 BACT DETERMINATION FOR ANNEALING FURNACE

This section evaluates BACT for the new annealing furnace being proposed by this project. Natural gas combustion in the units will result in emissions of PM/ PM_{10}/ $PM_{2.5}$, NO_x, VOC, and GHGs.

Annealing Furnace

The strip comes through the entry accumulator before entering the annealing furnace to ensure stable-speed processing.

At the beginning of the process, the strip is annealing inside a continuous furnace with a controlled atmosphere containing Nitrogen, Hydrogen, and Oxygen and at a given temperature. The primary purpose of the annealing furnace is to heat treat the steel strip coils to produce a more homogenous coil metallurgical structure. This is accomplished with a series of heating and cooling sections.

1.2.2.1 ANNEALING FURNACE $PM/PM_{10}/PM_{2.5}$ BACT

The annealing furnace has the potential to emit $PM/PM_{10}/PM_{2.5}$ emissions.

Step 1 – Identify Potential Control Technologies

PM emissions from combustion are primarily the result of incomplete combustion, though PM emissions are also produced from the carryover of noncombustible trace constituents in the fuel (such as ash and metallic additives). Natural gas contains a very small amount of noncombustible trace constituents that result in PM/ PM_{10}/ $PM_{2.5}$ emissions. The following technologies are potentially available control technologies for $PM/PM_{10}/PM_{2.5}$ emission controls for the annealing furnace.

TABLE 1-2 POTENTIAL CONTROL DEVICES FOR $PM/PM_{10}/PM_{2.5}$ FROM ANNEALING FURNACE

Control Type	Estimated PM/PM10/$PM_{2.5}$ Control Efficiency
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
Wet scrubber or high efficiency venturi scrubber	70% to 99% (<0.01 gr/dscf)
ESP	>98%(0.004 – 0.01 gr/dscf)
Clean fuel and good combustion practices	Base Case

The potentially applicable types of particulate control systems are described in detail below.

- ***Fabric Filters***[8] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level. The design efficiency of dry filtration typically ranges between 0.001 to 0.01 gr/dscf.
- ***Wet Scrubbers***[9, 10] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing PM_{10}/$PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.
- ***ESPs***[11, 12] - ESPs use an electrostatic field to charge particles contained in the gas stream. The charged particles migrate to a grounded collection surface where they are periodically dislodged by vibrating or rapping. The dust is collected in a hopper at the bottom of the ESP. With respect to $PM_{2.5}$ emissions, dry ESPs have a lower overall efficiency than baghouses. Dry ESPs are not designed to collect wet or sticky PM, such as condensable particles. Condensable matter will clog the ESP, stay attached to the plates, and possibly short out the unit. However, wet electrostatic precipitators (WESPs) can collect sticky particles and mists, as well as highly resistive or explosive dusts. The humid atmosphere that results from the continuous or intermittent washing in a wet ESP enables these units to collect high resistivity particles, absorb gases or cause pollutants to condense, and cool and condition the gas stream. Liquid particles or aerosols present in the gas stream are collected along with particles and provide another means of rinsing the collection electrodes.
- ***Clean Fuel and Good Combustion Practices*** - Fuels containing ash have the potential to produce particulate emissions. Additionally, fuels containing sulfur have the potential to produce sulfur compounds that may form condensable particulate emissions. Natural gas contains negligible amounts of particulate and is considered a low sulfur fuel. The use of good

8 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

9 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

10 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

11 Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-027, Washington, D.C.: Clean Air Technology Center, July 2003.

12 Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-029, Washington, D.C.: Clean Air Technology Center, July 2003.

combustion practices can minimize the potential particulate emissions associated with incomplete combustion.

Step 2 – Eliminate Technically Infeasible Options

Baghouses

A baghouse is a post-combustion control technology that utilizes a fine mesh filter to remove particulate emissions primarily from large volume gas streams containing high particulate concentrations. No examples have been found where a baghouse has been applied to an annealing furnace due to the reduced volume and minimal particulate concentration of the associated exhaust gas stream. The PM emissions from the annealing furnace are below the outlet concentration typically guaranteed for this control device. Therefore, baghouse technology is not technically feasible for the natural gas-fired annealing furnace.

Wet Scrubbing

No examples have been found where a scrubber has been applied to a similar natural gas-fired annealing furnace due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. Wet scrubbers remove PM from a gas stream by capturing it in liquid droplets. Wet scrubbers are not well suited for use on extremely fine particles and are generally ineffective collection devices for submicron particles. The particulate emissions from the annealing furnace will be a result of natural gas combustion and are less than 1 micrometer. The PM emissions from the annealing furnace are below the outlet concentration typically guaranteed for this control device. Therefore, wet scrubber technology is not technically feasible for the annealing furnace.

ESPs

Electrostatic precipitation is a post-combustion particulate emissions control most readily applied to large volume gas streams containing high particulate concentrations. No examples have been found where an ESP or WESP has been applied to a small natural gas fired annealing furnace due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. The PM emissions from the annealing furnace are below the outlet concentration typically guaranteed for this control device. Therefore, ESP is not technically feasible for the annealing furnace.

Post-combustion controls, such as baghouses, scrubbers, and ESPs are technically infeasible due to the high pressure drops associated with these units and the low concentrations of $PM/PM_{10}/PM_{2.5}$ present in the exhaust gas.

Step 3 – Rank Remaining Technically Feasible Control Options

Clean Fuel (Natural Gas) and Good Combustion Practices are the only remaining technically feasible control options.

Step 4 – Evaluate Remaining Control Technologies

Clean Fuel and Good Combustion Practices

During the review of available control technologies for combustion sources at similar plants, no determinations were found for the use of add-on controls to reduce $PM/PM_{10}/PM_{2.5}$ emissions from small natural gas-fired annealing furnaces. Therefore, AMC considers BACT for this source to be the use of natural gas, a clean-burning fuel with low $PM/PM_{10}/PM_{2.5}$ emissions, and good combustion practices. Use of natural gas and good combustion practices are applicable, economical, and will be employed for the annealing furnaces. Good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for annealing furnaces reveal that the most stringent limits for $PM/PM_{10}/PM_{2.5}$ are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for $PM/PM_{10}/PM_{2.5}$ from AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources, Section 1.4 - Natural Gas Combustion, are typically used to establish numerical limits. Generally, compliance with numerical $PM/PM_{10}/PM_{2.5}$ limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel.

AMC proposes to use clean fuel (natural gas) and good combustion practices, and a numerical limit of 1.9 pounds per million standard cubic feet (lb/MMscf) for PM (filterable) and 7.6 lb/MMscf $PM_{10}/PM_{2.5}$ as BACT for the annealing furnace. These limits are equivalent to average hourly emissions for filterable $PM/PM_{10}/PM_{2.5}$ of 0.18 lb/hr and for condensable PM of 0.52 lb/hr.

Compliance will be demonstrated through natural gas usage records and certification of good combustion practices. Examples of good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

1.2.2.2 ANNEALING FURNACE NO_X BACT

The annealing furnace has the potential to emit NOx emissions.

Step 1 – Identify Potential Control Technologies

The principal pollutant generated by combustion of natural gas is nitric oxide (NO) and nitrogen dioxide (NO_2), collectively referred to as NO_x. NO_x emissions produced during combustion are primarily from the thermal NO_x formation mechanism. Thermal NO_x results from the high temperature oxidation of nitrogen (N_2) and oxygen (O_2). Thermal NO_x formation is influenced by the flue gas residence time, excess oxygen, and primarily by temperature, becoming significant at temperatures above 2,800 ºF. The concentration of "thermal NO_x" is controlled by the nitrogen and oxygen molar concentrations and the temperature of combustion. Combustion at temperatures well below 1,300 ºC (2,370 ºF) forms much smaller concentrations of thermal NO_x.

The following technologies are potentially available controls for NO_x emission from the annealing furnace.

TABLE 1-3 POTENTIAL CONTROL DEVICES FOR NO_x FROM ANNEALING FURNACE

Control Type	Estimated NO_x Control Efficiency
SCR	70% -90%
NSCR	80% -90%
SNCR	40% -75%
Low-NO_x burners	40% -85%
Flue Gas Recirculation	30%-50%

The potential control devices to control NO_x emissions include the following:

- ***SCR***[13] - SCR units use a nitrogen-based reagent, such as ammonia (NH_3) or urea, to chemically reduce NO_x to molecular nitrogen and water vapor. The reagent is injected through a grid system into the flue gas stream, upstream of a catalyst bed. The waste gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst, where the reagent reacts selectively with NO_x within a specific temperature range.

  Operating temperatures between 480°F and 800°F are required of the gas stream at the catalyst bed, in order to carry out the catalytic reduction process. The greatest NO_x reduction occurs within a reaction window at catalyst bed temperatures between 600°F and 750°F for conventional catalysts and 470°F to 510°F for platinum based catalysts. The reaction of NH_3 and NO_x is favored by the presence of excess oxygen (greater than 1%). Depending on system design, NO_x removal rates of 70 to 90% are achievable under optimum conditions[14]. Technical factors related to this technology include the catalyst reactor design, optimum operating temperature, sulfur content of the charge, catalyst deactivation due to aging, ammonia slip emissions, and design of the ammonia injection system.

  Below the optimum temperature range, the catalyst activity is greatly reduced, potentially allowing unreacted ammonia (referred to as “ammonia slip”) to be emitted directly to the atmosphere. SCR systems may also be subject to catalyst deactivation over time, due to physical deactivation and/or chemical poisoning. Catalyst suppliers typically guarantee a 3-year catalyst lifetime to achieve a specified emission limit.

  For an SCR system to effectively reduce NO_x emissions, the exhaust stream must have a relatively stable gas flow rate, NO_x concentration, and temperature profile.

- ***NSCR***[15] – NSCR is a post-combustion add-on exhaust gas treatment system for exhaust streams with a low O_2 content (between 1 to 2%). It is often referred to as a “three-way conversion” catalyst since it reduces NO_x, unburned hydrocarbons (UBH), and CO simultaneously. In order to operate properly, the combustion process must be stoichiometric or near-stoichiometric. Under stoichiometric conditions, in the presence of the catalyst, NO_x is

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13 Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR), EPA-452/F-03-032, Washington, D.C.: Clean Air Technology Center, July 2003.

14 USEPA ACT Document - NO_x Emissions from Iron and Steel Mills, Sept. 1994.

15 Draft CAM Technical Guidance Document: Nonselective Catalytic Reduction, EPA, April 2002. Available online at: https://www3.epa.gov/ttnchie1/mkb/documents/B_16a.pdf

reduced by CO, resulting in nitrogen and carbon dioxide. Operating temperatures between approximately 700°F and 1500°F are required of the gas stream in order to carry out the catalytic reduction process. Depending on the temperature and oxygen concentration of the exhaust, NO_x removal rates of 80 to 90% are achievable.

- ***SNCR***[16]- SNCR is a post-combustion technique that involves injecting ammonia or urea into specific temperature zones in the upper furnace or, in other cases, connective pass of a boiler or process heater to reduce both NO_x and CO emissions. A temperature of between 1,600°F and 2,100°F is required at the injection site for the process reaction to take place. The ammonia or urea reacts with NO_x in the gas to produce molecular nitrogen and water vapor. The NO_x reduction reaction is favored over other chemical reaction processes for a specific temperature range and in the presence of oxygen; therefore, it is considered a selective chemical process. SNCR is effective only in a stoichiometric or fuel-rich environment where combustion gas is nearly depleted of oxygen.
- ***Low NOx Burners –*** Low NOx burners are modified combustion burners, designed to minimize NOx formation through low excess air firing, controlled mixing of primary combustion air and fuel, or reducing peak furnace temperature.
- ***Flue Gas Recirculation (FGR) -*** During flue gas recirculation, a portion of the flue gas is returned to the combustion zone in order to decrease the peak flame temperature. When the flue gas mixes with the combustion air, the oxygen concentration is reduced, leaving less oxygen available for combustion and thus reducing the peak flame temperature. In addition, the recirculated flue gas absorbs some of the heat during combustion, further reducing the peak flame temperature. Flue gas recirculation can be done alone or in combination with low-NOx burners. NOx can be reduced from 30 to 50% with the use of flue gas recirculation.[17]

Step 2 – Eliminate Technically Infeasible Options

NSCR

NSCR requires precise adjustments of process conditions such as oxygen content and temperature, and works best with certain windows of inlet concentration for NO_x, CO, and VOC. These operating windows are necessary because the catalyst was developed to react the NO_x, CO, and VOC with one another, reducing the emissions of each of these pollutants. NSCR has typically been used to control emissions from internal combustion engines and nitric acid plants. It is effective only in stoichiometric or fuel-rich environments where combustion gas is nearly depleted of oxygen (approximately 0.5% excess oxygen or less). The typical oxygen content of the exhausts from the annealing furnace makes NSCR ineffective for these types of sources. Due to the oxygen content of the fuel, the lack of demonstrated applications for NSCR to industrial heaters and dryers, and operation outside of the optimal temperature range, this technology does not have the practical potential for application that would make it an available or technically feasible control technology.

16 Air Pollution Control Technology Fact Sheet: Selective Non-Catalytic Reduction (SNCR), EPA-452/F-03-031, Washington, D.C.: Clean Air Technology Center, July 2003.

17 Guide to Low-Emission Boiler and Combustion Equipment Selection. Oak Ridge National Laboratory. April 2002. https://www.energy.gov/sites/prod/files/2014/05/f15/guide_low_emission.pdf

SNCR

SNCR is a post-combustion NO_x control technology which requires uniform mixing of the reagent and exhaust gas within a narrow temperature range. Operations outside of these operating conditions will significantly reduce removal efficiencies and may result in ammonia emissions, increased NO_x emissions. No examples were found where SNCR has been applied to a small natural gas burner. There is no appropriate temperature zone for SNCR application to the annealing furnace. Therefore, SNCR is not technically feasible for the annealing furnace.

Low NOx Burners and FGR

Low NOx burner technology for this application does not exist to produce the quality of product required. For the desired quality of product, the strip needs to be heated evenly. The heat rate needed to achieve this quality is not available in low NOx burners due to elevated temperatures. Additionally, low NOx burners have diminished efficiency at higher temperatures. Similarly, FGR can reduce flame temperatures which is not ideal for this process. A review of the RBLC showed that the annealing furnaces for Outokumpu Stainless USA, LLC utilized a combination of low NOx burners and exhaust gas re-circulation; however, this combination would still not achieve the product quality required. Therefore, low NOx burners are not technically feasible for the annealing furnace.

Step 3 – Rank Remaining Technically Feasible Control Options

1. SCR, 70% - 90%

Step 4 – Evaluate Remaining Control Technologies

The top remaining BACT is an SCR. SCR is a post-combustion technology that reduces NO_x emissions between 70% and 90% by reacting NO_x with ammonia in the presence of a catalyst. SCR technology has been most commonly applied to larger boilers and to natural gas-fired combustion turbines and requires ductwork. In order for an SCR system to effectively reduce NO_x emissions, the exhaust gas stream should have relatively stable gas flow rates, NO_x concentrations, and temperature.

Step 5 – Selection of BACT

BACT Limit Overview

SCR is the highest ranking control technology and is selected as BACT. No additional technologies will be considered for this source.

AMC will use SCR with a numerical NO_x emission limit of 0.05 lb/MMBtu from the annealing furnace. This limit is equivalent to average hourly NOx emissions of 4.68 lb/hr.

Compliance will be demonstrated through establishing a minimum temperature for the inlet to the catalyst and a minimum flow rate for the reagent injection. Stack testing will be conducted to set this limit.

1.2.2.3 ANNEALING FURNACE VOC BACT

The annealing furnace has the potential to emit VOC emissions.

Step 1 – Identify Potential Control Technologies

VOC emissions from combustion occur when some of the fuel is not completely burned or is only partially burned (incomplete combustion). The following technologies are potentially available control technologies for VOC emission controls for the annealing furnace.

TABLE 1-4 POTENTIAL CONTROL DEVICES FOR VOC FROM ANNEALING FURNACE

Control Type	Estimated VOC Control Efficiency
Thermal oxidizer (afterburner)	98% -99+%
Recuperative thermal oxidizer	98% -99+%
Regenerative thermal oxidizer	95-99%
Catalytic oxidizer	90-99%
Clean fuel and good combustion practices	Base Case

The potentially applicable types of VOC controls are described in detail below:

- ***Thermal Oxidation***[18] - A thermal oxidizer is a large vessel with a burner where fuel, gaseous waste, and air are introduced and combined to achieve the required DRE. The mixture must be exposed to a sufficiently high temperature for an adequate time period in a relatively turbulent environment to enable the chemical reactions to reach the degree of completion needed to achieve the DRE.
- ***Recuperative or Regenerative Thermal Oxidation***[19,20] **-** Recuperative and regenerative thermal oxidizers (RTOs) are two types of oxidizers that are widely applied to control VOCs. Both include some form of internal heat recovery, designed to reduce the operating cost of the system related to the consumption of a fuel source (typically natural gas) to raise the incoming gas temperature up to a combustion temperature within the burner zone as necessary to achieve the desired DRE. Heat recovery may either be recuperative or regenerative. In recuperative heat recovery, heat is recovered by passing the hot exhaust gases through a non-contact air-to-air heat exchanger, to heat the incoming air to the oxidizer. In regenerative heat recovery, hot exhaust gases and cool inlet gases are alternatively passed through a fixed bed, typically employing ceramics. RTOs have the ability to achieve a DRE of up to 99%, depending on the VOC inlet concentration.
- ***Catalytic Oxidation –*** Catalytic oxidizers use a bed of catalyst that facilitates the overall combustion of combustible gases. The catalyst increases the reaction rate and allows the conversion of CO and VOC to CO_2 at lower temperatures than a thermal oxidizer. The catalyst is typically a porous noble metal material that is supported in individual compartments within the unit. An auxiliary fuel-fired burner ahead of the bed heats the entering exhaust gases to 600°F to maintain proper bed temperature. Recuperative heat exchangers are used to recover the exiting exhaust gas heat and reduce the auxiliary fuel consumption. Exhaust gas temperatures that are too high may cause permanent damage to the catalyst, while operating

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18 Air Pollution Control Technology Fact Sheet: Thermal Incinerator, EPA-452/F-03-022, Washington, D.C.: Clean Air Technology Center, July 2003.

19 Air Pollution Control Technology Fact Sheet: Incinerator – Recuperative Type, EPA-452/F-03-020. Washington, D.C.: Clean Air Technology Center, July 2003.

20 Air Pollution Control Technology Fact Sheet: Regenerative Incinerator, EPA-452/F-03-021. Washington, D.C.: Clean Air Technology Center, July 2003.

temperatures that are too low may result in a lower VOC conversion efficiency. The typical VOC removal efficiency of a catalytic oxidation system is 90% or greater. The catalytic oxidation process for VOC control is very temperature sensitive.

- ***Clean Fuel and Good Combustion Practices*** - The use of natural gas as a combustion fuel, in preference over other fossil fuels such as oil or coal, results in fewer VOC emissions per unit of energy output. Natural gas also has benefits over other fossil fuels from the perspective of potentially generating other criteria pollutant emissions, such as SO_X. The use of good combustion practices can minimize the potential VOC emissions associated with incomplete combustion. Good combustion practices typically entail introducing the proper ratio of combustion air to the fuel, maintaining a minimum temperature in the firebox of the combustor, or a minimum residence time of fuel and air in the combustion zone. By employing good combustion practices, VOC emissions may be greatly reduced.

Step 2 – Eliminate Technically Infeasible Options

Thermal Oxidizer (Afterburner), Recuperative Thermal Oxidizer, and Regenerative Thermal Oxidizer

Thermal oxidation, recuperative thermal oxidation, and regenerative thermal oxidation are technically infeasible because it would involve more combustion following already highly efficient combustion. Further, thermal oxidation would increase combustion emissions and require additional fuel use (wasted energy). The VOC emissions from the annealing furnace are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for the natural gas-fired annealing furnace.

Catalytic Oxidizer

Catalytic oxidation is a post-combustion control technology that utilizes a catalyst to oxidize VOC into CO_2 or water (H_2O). The technology has most commonly been applied to natural gas fired combustion turbines. No examples were identified where add-on control technology has been applied to small natural gas-fired burners or annealing furnaces. Because of the low quantities of VOC emissions, the use of catalytic oxidation technology is determined to be not feasible.

For relatively small natural gas-fired sources, post-combustion controls, such as thermal oxidizers, recuperative incinerators, regenerative incinerators, and catalytic oxidizers are technically infeasible and impractical due to the relatively small quantities of VOC present in the exhaust gas. The VOC emissions from the annealing furnace are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for the natural gas-fired annealing furnace.

Step 3 – Rank Remaining Technically Feasible Control Options

1. Clean Fuel (Natural Gas) and Good Combustion Practices

Step 4 – Evaluate Remaining Control Technologies

Clean Fuel and Good Combustion Practices

Add-on controls, even if feasible, are not typically required for small combustion sources fired with natural gas. During the review of available control technologies for combustion sources at similar facilities, no determinations were found for the use of add-on controls to reduce VOC emissions from small natural gas-fired equipment. Therefore, AMC proposes that BACT for VOC emissions from the annealing furnace be limited to the use of natural gas (a clean-burning fuel with low VOC emissions), good combustion practices, and numerical emissions limits of 5.5 lb VOC/MMscf natural gas.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for annealing furnaces reveal that the most stringent limits for VOC are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for VOC from AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources, Section 1.4 - Natural Gas Combustion, are typically used to establish numerical limits. Generally, compliance with numerical VOC limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel and certification of good combustion practices.

AMC will utilize clean fuel (natural gas) and good combustion practices, and numerical emissions limits of 5.5 lb VOC/MMscf natural gas as BACT for VOC emissions from the annealing furnace. This limit is equivalent to average hourly VOC emissions of 0.50 lb/hr.

Compliance will be demonstrated through natural gas combustion records and certification of good combustion practices. Examples of good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

1.2.2.4 ANNEALING FURNACE GHG BACT

CO_2e emissions from the proposed annealing furnace will result from the combustion of natural gas. In a properly tuned heater, a majority of the fuel carbon in natural gas is converted to CO_2 during the combustion process. Even burners operating with poor combustion efficiency produce minimal amounts of CH_4, CO, and VOC compared to CO_2 levels. Thus, the following control analysis focuses on CO_2 emissions.

Step 1 – Identify Potential Control Technologies

Potential control options are identified for CO_2 below. Because the primary GHG emitted by the proposed projects in this permit application is CO_2, the control technologies and measures presented in this section focus on CO_2 control technologies.

- ***Carbon Capture and Sequestration*** - Carbon capture and sequestration (CCS) is the long-term isolation of fossil fuel CO_2 emissions from the atmosphere through capturing and storing the CO_2 deep in the subsurface of the earth. CCS is the only potentially available add-on control option to reduce large-scale direct emissions from industrial processes.[21] CCS is made up of three key stages:

[21] https://archive.epa.gov/epa/climatechange/carbon-dioxide-capture-and-sequestration-overview.html

1. Capture: Carbon capture is the separation of CO_2 from other gases produced when fossil fuels are combusted. Post-combustion CO_2 separation can be performed with chemical absorption systems using aqueous solution of amines as chemical solvents, or physical absorption systems using methanol or other solvents.
2. Transport: After separation, CO_2 is compressed to facilitate transportation and storage if a locally available site for direct injection is unavailable. After compression, CO_2 is transported utilizing a third-party CO_2 pipeline system to transport CO_2 to distant geologic formations that may be more conducive to sequestration than sites in the immediate area. Building such a pipeline for dedicated use by a single facility will certainly make any project economically infeasible, from both an absolute and BACT-review perspective. However, such an option may be effective only if both adequate storage capacity exists downstream and reasonable transportation prices can be arranged with the pipeline operator.
3. Storage: At a storage site, CO_2 is injected into deep underground rock formations, often at depths of one (1) km or more. Appropriate storage sites include depleted oil fields, depleted gas fields, rock formations that contain a high degree of salinity (saline formations). These potential sites must be evaluated to ensure they can store CO_2 safely and securely. At the site, the CO_2 is injected underground into solid, but porous rock such as sandstone, shale, dolomite, or basalt. These formations must be located under at least one layer of cap rock to prevent upward migration of the CO_2. Monitoring, reporting, and verification are important to demonstrate that CO_2 is safely stored.

- ***Energy Efficiency Measures***– Thermal efficiency is an emissions reduction strategy focused on increasing energy efficiency. Energy efficient process reduce the amount of fuel consumed. Reductions in fuel consumption result in reductions of direct emissions of GHGs at the steel mill, and reductions in electricity usage result in reductions of indirect GHG emissions.

Step 2 – Eliminate Technically Infeasible Options

Carbon Capture and Sequestration

Having a technically feasible carbon capture technology that is based on removing CO_2 in the gaseous form but that does not include viable long-term storage or a CO_2 transport system to move captured CO_2 to the storage site will not accomplish the goal of removing CO_2 from the atmosphere. Therefore, for CCS technology to be considered a technically feasible control option for consideration as BACT, carbon capture, carbon transport, and carbon storage must all be examined and deemed both available and technically feasible for the proposed source.

Carbon Capture

According to the Global CCS Institute[22], Abu Dhabi CCS is the world's first commercial CCS facility in the iron and steel industry at the Emirates Steel Industries factory in Mussafah with a capture capacity of 0.8 million metric tons per year of CO_2 from direct reduced iron (DRI). The DRI process produces a pure stream of CO_2 (greater than 98 percent), which was originally vented to

[22] Global CCS Institute, Canberra, Australia, May 2018. Project status available on-line at: http://www.globalccsinstitute.com/projects/abu-dhabi-ccs-project-phase-1-being-emirates-steel-industries-esi-ccs-project

the atmosphere. The project scope includes operation of a greenfield CO_2 Compression Facility (CCF) including dehydration, adjacent to the facility. CO_2 is transferred at low pressure to the CCF. At the CCF, CO_2 is dehydrated, compressed, metered, and exported to a CO_2 pipeline. CO_2 is then transported through an eight inch pipeline for EOR purposes. Although this project is associated with the Iron and Steel Production Industry, none of the proposed project emission sources at AMC have similar exhaust characteristics, nor will any of the exhaust streams consist of pure CO_2. The annealing furnace will contain other products of combustion, making the exhaust stream not suitable for CCS; therefore, there is no specific evidence that there is a commercially available carbon capture system of the scale that would be required to control the CO_2 emissions for the proposed source.

Carbon Storage

The small and large-scale CO_2 storage projects identified by National Energy Technology Laboratory,[23] have not yet reached the licensing and commercial stage of development. Indeed, these projects are being undertaken in public-private partnership arrangements, with significant financial support being provided by the Department of Energy. Moreover, the stated purpose of the large-scale projects is to "validate that CCS can be conducted at a commercial scale." In fact, the relatively small storage capacities of these projects (the largest of which is approximately 5 million metric tons) suggests that they are being conducted at a pilot scale. Technologies in the pilot scale testing stages of development are not considered "available" technologies. Because these pilot scale projects have not yet reached the licensing and commercial stage of development, permanent geological sequestration of CO_2 is not an available technology and has not been demonstrated for annealing furnaces.

Dedicated geological sequestration of CO_2 requires close proximity to a favorable geologic formation. Options for permanent sequestration of CO_2 in proximity of the proposed facility that could accommodate the amount of CO_2 generated from the proposed facility could not be found. Further, extensive characterization studies would be needed to determine the extent and storage potential for CO_2 in geological formations near the proposed facility. These studies would take several years of investigation, including drilling characterization wells, and would likely require small-scale injection testing before determining their full-scale viability.

Nevertheless, AMC has also evaluated cost effectiveness of CCS as a potential BACT under Step 4 of the top-down BACT analysis.

Step 3 – Rank Remaining Technically Feasible Control Options

As CCS is considered to be technically infeasible, energy efficiency measures are the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

A review of literature and the RBLC database listed an evaluation of CCS and terrestrial sequestration performed by the Gerdau Macsteel steel mill. Of the two evaluated, terrestrial sequestration was the lower cost at $162/ton. It is important to note that the overall cost for the

[23] National Energy Technology Laboratory National Carbon Sequestration Database and Interactive Viewer, available online at: https://www.netl.doe.gov/research/coal/carbon-storage/natcarb-atlas

project was listed as $223,923,000 and did not include an annual upkeep cost. Ultimately the BACT proposed was an energy efficiency plan for the melt shop.

The cost of CCS is difficult to determine due to the amount of experience in actual operation. Many assumptions based on system boundaries, fuel price, capital cost estimation, interest rates, economic lifetime, among other factors can have a large impact. Additionally, a drawback for some capture of the CO_2 capture technologies is the high energy consumption in addition for the potential of steam usage.[24] Despite these factors, an economic evaluation is shown in the following table.

TABLE 1-5 POTENTIAL CONTROL DEVICES FOR CO_2 FROM ANNEALING FURNACE

Post-Combustion CO_2 Capture		
Capital [1]	$110/ton	$5,280,562
Pipeline Cost Breakdown [2]		
L, Pipeline Length (miles)		150
D, Pipeline Diameter (inches)		12
Pipeline Costs [3]		
Materials	$64,632 + $1.85 x L x (330.5 x D^2 + 686.7 x D + 26,960)	$34,554,223
Labor	$341,627 + $1.85 x L x (343.2 x D^2 + 2074 x D + 170,013)	$102,196,420
Miscellaneous	$150,166 + $1.58 x L x (8,417 x D + 7,234)	$25,802,572
Right of Way	$48,037 + $1.2 x L x (577 x D + 29,788)	$9,982,833
Other Capital [4]		
CO_2 Surge Tank	Fixed	$1,244,744
Pipeline Control System	Fixed	$111,907
O&M [3]		
Fixed O&M ($/year)	$8,632 x L	$1,941,916

Geologic Storage Costs [2]		
Number of Injection Wells		1
Well Depth (m)		2,134
CO_2 Captured (tons)		43,186
Capital		
Site Screening and Evaluation	Fixed	$4,738,488
Injection Wells	$240,714 x $e^{0.0008 \times \text{Well Depth}}$	$1,327,177
Injection Equipment	$94,029 x $(7,839/(280 \times \text{Number of Injection Wells}))^{0.5}$	$497,523
Liability Bond	Fixed	$5,000,000
Declining Capital Funds		
Pore Space Acquisition	$0.334/short ton CO_2	$14,424
O&M		
Normal Daily Expenses	$11,566/Injection Well	$11,566
Consumables	$2,995/yr/ton CO_2/day	$354,365
Surface Maintenance	$23,478 x $(7,839/(280 \times \text{Number of Injection Wells}))^{0.5}$	$124,226
Subsurface Maintenance	$7.08/ft-depth/Injection Well	$15,109

[24] CO2 abatement in the iron and steel industry, January 2012. https://usea.org/sites/default/files/012012_CO2%20abatement%20in%20the%20iron%20and%20steel%20industry_ccc193.pdf

Annualized Cost Estimate	
Economic Life, years	20
Interest Rate (%)	7
Capital Costs	**$190,750,874**
O&M Costs (Annual)	$2,447,181
Capital Recovery	$18,005,530
Total Annualized Cost	**$20,452,711**

NOTES:

[1] Adapted from CO2 abatement in the iron and steel industry, January 2012. Capital Costs were taken from Table 25 based on Physical absorption for TGR-BF due to characteristics of exhaust stream. Cost adjusted for inflation from 2011 dollars.

[2] Pipeline and Geologic Storage cost estimates based on National Energy Technology Laboratory (US DOE) document, *Estimating Carbon Dioxide Transport and Storage Costs*, DOE/NETL-2010/1447 (March 2010). The distance given is to the nearest CO_2 transportation pipeline, the Denbury Pipeline.

[3] Pipeline costs have been adjusted for inflation from 2007 dollars.

[4] Adapted from FE/NETL CO_2 Transport Cost Model (2018): Model Overview, National Energy Technology Laboratory, May 8, 2018.

Based on the CCS economic evaluation, the estimated capital costs would be $190,750,874. It should be noted that the direct annual operating costs of the carbon capture technology which includes a significant amount of steam and electricity, were not included in this economic evaluation and would add to the very high capital costs. This energy demand would create additional GHG emissions among other pollutants.

Due to the difficulty of capturing CO_2 from the annealing furnace due to the exhaust characteristics, the extreme cost associated with CCS, the fluctuating demand for EOR, and secondary environmental impacts, CCS is determined to be technically and economically infeasible for the proposed source.

Energy Efficient Design

In a burner, gas is fed directly to the burner, while an airstream provides the needed oxygen for combustion. Nearly 100% of the fuel is converted to heat, with an overall thermal efficiency around 92%. Therefore, fuel consumption and operating costs are reduced when compared to an indirect-fired unit. Furthermore, direct-fired heaters can be constructed to essentially any required size, and the facility does not have to opt for an oversized heater. The exhaust from the annealing furnace is used for the strip preheating as an energy efficiency measure.

Step 5 – Selection of BACT

For CO_2e emissions generated from the annealing furnace, BACT is selected to be energy efficient design. No adverse energy, environmental, or economic impacts are associated with this control option. Compliance will be demonstrated through natural gas usage records. CO_2e from the annealing furnace will be limited to 10,967 lb/hr and 48,034 tpy for the annealing furnace, based on the default emission factors from 40 CFR Part 98 Subpart C, Tables C-1 and C-2 for natural gas.

1.2.3 BACT DETERMINATION FOR SHOT BLASTER

This section evaluates BACT for the new shot blaster being proposed by this project.

Shot Blaster

Once annealed, cooled down and dried out, the scale at the surface of the strip is mechanically broken off with a shot blaster. A scale collection system that removes solids and dust generated during the threading of the processor and mechanical cleaning operations vents the air through a baghouse to the atmosphere. The continuous strip is then chemically cleaned in the pickling section.

1.2.3.1 SHOT BLASTER PM/PM_{10}/$PM_{2.5}$ BACT

Shot blasters have the potential to emit a small amount of PM/PM_{10}/$PM_{2.5}$ emissions due to the abrasive blasting of steel. All particulate emissions from the shot blaster will be filterable.

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the shot blaster was developed.

TABLE 1-6 POTENTIAL CONTROL DEVICES FOR PM_{10}/$PM_{2.5}$ FROM SHOT BLASTER

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency[25]
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
Wet scrubber	70-99% (~0.01 gr/dscf)
ESP	95-99+% (0.002 – 0.004 gr/dscf)
Wet suppression	Varies
Good work practices	Varies

Each of the potentially applicable controls is described below.

- ***Fabric Filters***[26] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level. The design efficiency of dry filtration

25 Grain loadings are for filterable PM/PM_{10}/$PM_{2.5}$ only. Limited data is available for the condensable portion, and not all particulate control devices effectively control CPM.

26 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

typically ranges between 0.001 to 0.01 gr/dscf. Baghouse technology has been used extensively to control filterable $PM/PM_{10}/PM_{2.5}$ emissions from shot blasters achieving outlet concentrations as low as 0.003 gr/dscf. Baghouses are expected to be the most effective control device and are the predominant control device used to limit filterable PM emissions from shot blasters.

- ***Wet Scrubbers***[27, 28] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.

- ***ESPs***[29, 30] - ESPs use an electrostatic field to charge particles contained in the gas stream. The charged particles migrate to a grounded collection surface where they are periodically dislodged by vibrating or rapping. The dust is collected in a hopper at the bottom of the ESP. With respect to $PM_{2.5}$ emissions, dry ESPs have a lower overall efficiency than baghouses. Dry ESPs are not designed to collect wet or sticky PM, such as condensable particles. Condensable matter will clog the ESP, stay attached to the plates, and possibly short out the unit. However, wet electrostatic precipitators (WESPs) can collect sticky particles and mists, as well as highly resistive or explosive dusts. The humid atmosphere that results from the continuous or intermittent washing in a wet ESP enables these units to collect high resistivity particles, absorb gases or cause pollutants to condense, and cool and condition the gas stream. Liquid particles or aerosols present in the gas stream are collected along with particles and provide another means of rinsing the collection electrodes.

- ***Wet Suppression*** – Fine mists of water applied to dust generating sources, such as bulk material drop points, reduce dust emissions by impacting small particulates with water. The wetted particulate becomes heavier and quickly settles out of the air, reducing airborne dust. Alternatively, material may be thoroughly wetted prior to handling, which suppresses the generation of dust when the material is disturbed.

- ***Good Work Practices*** – Good work practices are used in areas where it is difficult to feasibly implement other control technologies. Good work practices generally consist of activities such as proper equipment maintenance that can be employed to prevent particulates from becoming airborne.

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27 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

28 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

29 Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-027, Washington, D.C.: Clean Air Technology Center, July 2003.

30 Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-029, Washington, D.C.: Clean Air Technology Center, July 2003.

Step 2 – Eliminate Technically Infeasible Control Technologies

ESPs

Several factors preclude ESP application to shot blaster control. A key parameter for ESP control is the composition of the particles to be collected. Iron compounds adhere very strongly to the collection plate of the ESP (due to their electromagnetic properties); therefore, are very difficult to remove. Because it is difficult to dislodge iron particles from the grounded collection surface of an ESP, the control efficiency is greatly reduced. Metal compounds tend to foul ESP electrodes, also reducing effectiveness. In addition, an ESP is greatly affected by sensitivity to the variations in flow rate, solids loading, and temperature fluctuations inherent in shot blaster operations. ESPs have not been used on shot blasters and for the reasons outlined, are considered technically infeasible[31].

Wet Suppression

Wet suppression is not suitable for control of shot blaster emissions. Wet materials may clog equipment and create additional wear.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Baghouse, 95% – 99+% (As low as 0.001 gr/dscf)
2. Wet Scrubber, 70% – 99% (~ 0.01 gr/dscf)
3. Good work practices

Step 4 – Evaluate the Most Effective Controls and Document Results

Fabric Filter (Baghouse)

A baghouse is well-suited for controlling emissions from a shot blaster because baghouses are largely insensitive to changes in dust loading and changing characteristics in a gas stream. For these reasons, baghouses are the industry standard for shot blaster particulate controls and the top ranked control technology for $PM/PM_{10}/PM_{2.5}$. AMC proposes to control emissions from the shot blaster with a baghouse.

Wet Scrubber

High energy scrubbers have disadvantages compared to baghouses. Scrubber systems have high pressure drops that result in high energy demands and high operating costs. These systems also require water treatment and sludge disposal. A high energy scrubber is eliminated from further consideration due to high energy demands (environmental impacts) and lower PM control efficiency compared to baghouses.

Based on RBLC results and vendor provided data, AMC is proposing BACT to be 0.003 gr/dcsf for $PM/PM_{10}/PM_{2.5}$ (filterable) emissions from the shot blaster in conjunction with good work practices.

31 Note, historically, ESPs have been applied to control $PM/PM_{10}/PM_{2.5}$ emissions from basic oxygen furnaces (BOFs); specifically, to control emissions from oxygen blow.

Step 5 – Select BACT

BACT Limit Overview

AMC proposes BACT to be a combination of a baghouse and the use of good work practices for control of $PM/PM_{10}/PM_{2.5}$ emissions from the shot blaster. The proposed BACT emission limit for the shot blaster is 0.003 gr/dscf for PM emissions, 0.0004 gr/dscf for PM_{10} emissions and 0.00004 gr/dscf for $PM_{2.5}$ emissions. The proposed BACT emission limit for $PM_{10}/PM_{2.5}$ (total) emissions is derived from US EPA's AP-42, Compilation of Air Pollutant Emission Factors. Section 13.2.6 provides emission factors for abrasive blasting, such as shotblasting. This section provides a breakdown of total PM_{10} emissions as 14.3% and $PM_{2.5}$ emissions as 1.43% of filterable emissions. This limit is equivalent to filterable PM emissions of 0.67 lb/hr and 0.10 lb/hr total PM_{10} and 0.01 lb/hr for total $PM_{2.5}$ emissions.

AMC proposes to demonstrate ongoing compliance with the emission limitations through good work practices, including periodic inspections to ensure equipment is in proper working order.

1.2.4 BACT DETERMINATION FOR PICKLING LINE

This section evaluates BACT for the new pickling line being proposed by this project.

Pickling Line

Hydrochloric acid (HCl) chemically removes the ferric oxide layer from the surface of the strip. The pickling tank is divided into separate pickling chambers. Each pickling chamber has a dedicated acid supply tank. The pickling and acid supply tanks are fitted with covers to reduce evaporative losses and air emissions. Spent acid is pumped to the HCl acid regeneration plant (ARP). The strip then enters the rinsing section, where demineralized water is used to rinse the strip. The steel strip then enters a drying section where hot air, which is indirectly heated through steam coils, removes the remaining moisture from the strip. Acid fumes generated during pickling are captured and treated in a scrubber and vented.

1.2.4.1 PICKLING LINE $PM/PM_{10}/PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential $PM/PM_{10}/PM_{2.5}$ controls for the pickling line was developed.

TABLE 1-7 POTENTIAL CONTROL DEVICES FOR $PM_{10}/PM_{2.5}$ FROM PICKLING LINE

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ Control Efficiency[32]
Fabric filter (Baghouse)	95-99+% (As low as 0.0043 gr/dscf)
Wet scrubber	70-99% (~0.04 gr/dscf)

[32] Grain loadings are for filterable $PM/PM_{10}/PM_{2.5}$ only. Limited data is available for the condensable portion, and not all particulate control devices effectively control CPM.

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ Control Efficiency[32]
Mist eliminators	70-99%

Each of the potentially applicable controls is described below.

- ***Fabric Filters***[33] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level.
- ***Wet Scrubbers***[34, 35] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing.
- ***Mist Eliminators***[36] **-** Fiber-bed scrubbers or mist eliminators are capable of control efficiencies ranging from 70% to 99%, depending on exhaust stream characteristics and size of aerosols. Insoluble PM will clog the fiber-bed filter over time; therefore, fiber-bed filters have a limited commercial acceptance for dust collection. Fiber-bed scrubbers can treat exhaust streams with flow rates ranging from 1,000 scfm to 100,000 scfm and temperatures up to 140°F. For mist eliminators to be considered effective at reducing $PM/PM_{10}/PM_{2.5}$ emissions, the inlet loading must be at least 0.1 gr/dscf.

Step 2 – Eliminate Technically Infeasible Control Technologies

Fabric Filter (Baghouse)

Baghouses are technically infeasible for the pickling line process. Baghouses are not designed for wet media and the resulting moisture/particulate combination would cause blinding of the bags. It is also likely that acid attack on the bags would rapidly render them unusable.

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33 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

34 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

35 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

36 Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Wet Scrubber, 70% – 99% (~ 0.04 gr/dscf)
2. Mist eliminators

Step 4 – Evaluate the Most Effective Controls and Document Results

Wet Scrubber

The highest ranking control technology of wet scrubber is selected as BACT.

Based on a review of Title V permits, AMC is proposing BACT to be 0.001 gr/dscf for PM/PM_{10}/$PM_{2.5}$ (filterable) emissions, using a wet scrubber.

Step 5 – Select BACT

BACT Limit Overview

AMC proposes BACT to be a wet scrubber for control of PM/PM_{10}/$PM_{2.5}$ emissions from the pickling line. The proposed BACT emission limit for the pickling line is 0.001 gr/dscf for PM/PM_{10}/$PM_{2.5}$ emissions. This limit is equivalent to PM/PM_{10}/$PM_{2.5}$ emissions of 0.20 lb/hr.

1.2.5 BACT DETERMINATION FOR TANK FARM

This section evaluates BACT for the new tank farm being proposed by this project.

Tank Farm

The waste acid and the rinse water produced by the pickling plant are collected in storage tanks in the ARP tank farm. The size of the storage tanks allows the pickling line and the ARP to be operated independently of each other. The buffer volume is usually sized nominally for a three-day hold-up time, which is sufficient to shut down and restart the ARP, for example over a weekend. The acid recovered in the ARP is collected in storage tanks for transfer to the pickling line. The capacity of the storage tanks for regenerated acid is usually the same as that of the tanks for waste acid. The tank farm is usually piped in such a way to allow the RA / WA tanks to be used interchangeably.

The storage tanks for rinse water and for fresh acid are also adapted to the capacity of the pickling line. The tank farm is equipped with the pumps for waste and regenerated acid, for rinse water and fresh acid. The tanks are all vented and connected to a tank farm scrubber.

A sump serves to collect all liquids in both the tank farm and ARP which leave the process vessels and storage tanks as overflows, drains, leaks, pump seal flushes and wash downs. A collecting pit pump returns these to the storage tanks for rinse water or for waste acid, or to the wastewater treatment plant.

1.2.5.1 TANK FARM PM/PM_{10}/$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the tank farm was developed.

TABLE 1-8 POTENTIAL CONTROL DEVICES FOR $PM_{10}/PM_{2.5}$ FROM TANK FARM

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ Control Efficiency[37]
Fabric filter (Baghouse)	95-99+% (As low as 0.0043 gr/dscf)
Wet scrubber	70-99% (~0.04 gr/dscf)
Mist eliminators	70-99%
Good work practices	Varies

Each of the potentially applicable controls is described below.

- ***Fabric Filters***[38] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level.
- ***Wet Scrubbers***[39, 40] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing.
- ***Mist Eliminators***[41] **-** Fiber-bed scrubbers or mist eliminators are capable of control efficiencies ranging from 70% to 99%, depending on exhaust stream characteristics and size of aerosols. Insoluble PM will clog the fiber-bed filter over time; therefore, fiber-bed filters have a limited commercial acceptance for dust collection. Fiber-bed scrubbers can treat exhaust streams with flow rates ranging from 1,000 scfm to 100,000 scfm and temperatures

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37 Grain loadings are for filterable $PM/PM_{10}/PM_{2.5}$ only. Limited data is available for the condensable portion, and not all particulate control devices effectively control CPM.

38 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

39 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

40 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

41 Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

up to 140°F. For mist eliminators to be considered effective at reducing $PM/PM_{10}/PM_{2.5}$ emissions, the inlet loading must be at least 0.1 gr/dscf.

- ***Good Work Practices*** – Good work practices are used in areas where it is difficult to feasibly implement other control technologies. Good work practices generally consist of activities such as proper equipment maintenance that can be employed to prevent particulates from becoming airborne.

Step 2 – Eliminate Technically Infeasible Control Technologies

Fabric Filter (Baghouse)

Baghouses are technically infeasible for the pickling line process. Baghouses are not designed for wet media and the resulting moisture/particulate combination would cause blinding of the bags. It is also likely that acid attack on the bags would rapidly render them unusable.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Wet Scrubber, 70% – 99% (~ 0.04 gr/dscf)
2. Mist eliminators
3. Good work practices

Step 4 – Evaluate the Most Effective Controls and Document Results

Wet Scrubber

The highest ranking control technology of wet scrubber is selected as BACT.

Based on a review of Title V permits, AMC is proposing BACT to be 0.005 gr/dscf for $PM/PM_{10}/PM_{2.5}$ (filterable) emissions, using a wet scrubber.

Step 5 – Select BACT

BACT Limit Overview

AMC proposes BACT to be a wet scrubber for control of $PM/PM_{10}/PM_{2.5}$ emissions from the tank farm. The proposed BACT emission limit for the tank farm is 0.001 gr/dscf for $PM/PM_{10}/PM_{2.5}$ emissions. These limits are equivalent to hourly emissions for filterable PM/PM_{10} of 0.12 lb/hr, hourly emissions for filterable $PM_{2.5}$ of 0.11 lb/hr, and for condensable PM of 0.09 lb/hr.

1.2.6 BACT DETERMINATION FOR IRON OXIDE BINS WITH BAGFILTERS

This section evaluates BACT for the new iron oxide bins with bagfilters being proposed by this project.

Iron Oxide Bins with Bagfilters

After being formed in the spray roaster, iron oxide exits the roaster through a lump breaker and then through a variable frequency driven rotary air-lock valve. The lump breaker breaks any demineralized agglomerate of iron oxide that may be formed. The rotary valve speed can be varied to control the flow of iron oxide to the pneumatic conveying system. In the pneumatic conveyor, the iron oxide is conveyed to the top of one of two storage bins. The conveying air is filtered by bag filters mounted on the bin-top before being discharged to the atmosphere. The oxide blower which is also mounted on the bin platform creates suction in the conveying line for iron oxide movement. Each of the two iron oxide storage bins is provided with a separate bag filter. Since only one bin is used at a time, there is only one common stack for both the bins.

1.2.6.1 IRON OXIDE BINS WITH BAGFILTERS PM/PM_{10}/$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the iron oxide bins with bagfilters was developed.

TABLE 1-9 POTENTIAL CONTROL DEVICES FOR PM_{10}/$PM_{2.5}$ FROM OXIDE BINS WITH BAGFILTERS

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency[42]
Fabric filter (Baghouse)	95-99+% (As low as 0.0043 gr/dscf)
Wet scrubber	70-99% (~0.04 gr/dscf)
Mist eliminators	70-99%

Each of the potentially applicable controls is described below.

- ***Fabric Filters***[43] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level.
- ***Wet Scrubbers***[44, 45] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing PM_{10}/$PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers

42 Grain loadings are for filterable PM/PM_{10}/$PM_{2.5}$ only. Limited data is available for the condensable portion, and not all particulate control devices effectively control CPM.

43 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

44 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

45 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing.

- ***Mist Eliminators*[46] -** Fiber-bed scrubbers or mist eliminators are capable of control efficiencies ranging from 70% to 99%, depending on exhaust stream characteristics and size of aerosols. Insoluble PM will clog the fiber-bed filter over time; therefore, fiber-bed filters have a limited commercial acceptance for dust collection. Fiber-bed scrubbers can treat exhaust streams with flow rates ranging from 1,000 scfm to 100,000 scfm and temperatures up to 140°F. For mist eliminators to be considered effective at reducing $PM/PM_{10}/PM_{2.5}$ emissions, the inlet loading must be at least 0.1 gr/dscf.

Step 2 – Eliminate Technically Infeasible Control Technologies

All proposed controls in Step 1 are technically feasible.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Baghouse, 95% – 99+% (As low as 0.0043 gr/dscf)
2. Wet Scrubber, 70% – 99% (~ 0.04 gr/dscf)
3. Mist eliminators

Step 4 – Evaluate the Most Effective Controls and Document Results

Fabric Filter (Baghouse)

A baghouse is well-suited for controlling emissions from the iron oxide bins with bagfilters because baghouses are largely insensitive to changes in dust loading and changing characteristics in a gas stream. The USEPA RBLC database did not list information for the iron oxide bins with bagfilters or the acid regeneration process. A review of Title V permits was completed, and an acid regeneration process was identified for ThyssenKrupp Steel and Stainless USA, LCC (TK) in Mount Vernon, Alabama, which has a permitted emission limit of 0.0043 gr/dscf, using both a baghouse and a wet scrubber. However, this source was never built or tested.

AMC proposes to control emissions from the iron oxide bins with bagfilters with a baghouse with a permitted emission limit of 0.0061 gr/dscf.

Wet Scrubber

High energy scrubbers have disadvantages compared to baghouses. Scrubber systems have high pressure drops that result in high energy demands and high operating costs. These systems also require water treatment and sludge disposal. A high energy scrubber is eliminated from further consideration due to high energy demands (environmental impacts) and lower PM control efficiency compared to baghouses.

Based on a review of Title V permits, AMC is proposing BACT to be 0.0061 gr/dscf for $PM/PM_{10}/PM_{2.5}$ (filterable) emissions, using a baghouse. Outokumpu Stainless Steel, LLC proposed a BACT of 0.002 gr/dscf for $PM/PM_{10}/PM_{2.5}$ (filterable) emissions from ARP Oxide Storage, but that limit has not been tested and proven.

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[46] Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

Step 5 – Select BACT

BACT Limit Overview

AMC proposes BACT to be a baghouse for control of PM/PM_{10}/$PM_{2.5}$ emissions from the iron oxide bins with bagfilters. The proposed BACT emission limit for the iron oxide bins with bagfilters is 0.0061 gr/dscf for PM/PM_{10}/$PM_{2.5}$ emissions. These limits are equivalent to hourly emissions for filterable PM/PM_{10} of 0.17 lb/hr, hourly emissions for filterable $PM_{2.5}$ of 0.16 lb/hr, and for condensable PM of 0.14 lb/hr.

1.2.7 BACT DETERMINATION FOR SPRAY ROASTER

This section evaluates BACT for the new spray roaster being proposed by this project.

Spray Roaster

The ARP processes ferrous chloride solution (FCS) produced by the pickling lines to regenerate hydrochloric acid (HCl) and produce solid iron oxide (Fe_2O_3). FCS from the pickling lines is transferred via closed pipe and stored in a tank farm (Tank Farm #1). The FCS is first concentrated by heat transfer in a venturi scrubber using hot HCl gasses from a spray roaster. The concentrated FCS, referred to as concentrated pickle liquor (CPL), is then fed to the spray roaster as a fine spray. The spray roaster utilizes natural gas burners to generate heat for dehydration and chemical processing of the CPL. Solid iron oxide generated at the bottom of the spray roaster is stored in iron oxide bins and shipped offsite. Emissions from the iron oxide bins are controlled by bag filters. The free HCl in the CPL vaporizes in the spray roaster and leaves the spray roaster mixed with off gases. The HCl in the off gases is dissolved into a solution of 18 percent HCl by passing through a packed column absorber by contacting with sprayer water. Emissions from the spray roaster ARP process units are routed to four control devices in series before exiting through a single stack : a packed column wet scrubber, a dust venturi scrubber and vapor separator, a second packed wet scrubber, and a mist eliminator. The second packed wet column scrubber could be designed to utilize a chemical treatment if necessary to meet emissions limits.

The regenerated 18 percent HCl solution is then stored in Tank Farm #1, before being transferred via closed pipe to the pickling lines, the truck loading bay, or the railcar loading bay. From the loading bays, HCl solution is shipped offsite. Emissions from the truck loading bay and the railcar loading bay are routed to a wet scrubber that also controls the emissions from Tank Farm #1. HCl is currently never shipped offsite. FCS may potentially be shipped in or out, and HCl has the potential to be shipped offsite in the future.

1.2.7.1 SPRAY ROASTER PM/PM_{10}/$PM_{2.5}$ BACT

PM/PM_{10}/$PM_{2.5}$ is emitted from the spray roaster.

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the spray roaster was developed.

TABLE 1-10 POTENTIAL CONTROL DEVICES FOR $PM_{10}/PM_{2.5}$ FROM SPRAY ROASTER

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ Control Efficiency[47]
Fabric filter (Baghouse)	95-99+% (As low as 0.0043 gr/dscf)
Wet scrubber	70-99% (~0.04 gr/dscf)
Mist eliminators	70-99%

Each of the potentially applicable controls is described below.

- ***Fabric Filters***[48] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level.
- ***Wet Scrubbers***[49, 50] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing.
- ***Mist Eliminators***[51] **-** Fiber-bed scrubbers or mist eliminators are capable of control efficiencies ranging from 70% to 99%, depending on exhaust stream characteristics and size of aerosols. Insoluble PM will clog the fiber-bed filter over time; therefore, fiber-bed filters have a limited commercial acceptance for dust collection. Fiber-bed scrubbers can treat exhaust streams with flow rates ranging from 1,000 scfm to 100,000 scfm and temperatures up to 140°F. For mist eliminators to be considered effective at reducing $PM/PM_{10}/PM_{2.5}$ emissions, the inlet loading must be at least 0.1 gr/dscf.

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47 Grain loadings are for filterable $PM/PM_{10}/PM_{2.5}$ only. Limited data is available for the condensable portion, and not all particulate control devices effectively control CPM.

48 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

49 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

50 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

51 Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

Step 2 – Eliminate Technically Infeasible Control Technologies

Fabric Filter (Baghouse)

High Fabric filters are applicable to sources that generate dust and can be captured and ducted to a central location. Typical inlet concentrations to baghouse are 1 to 23 grams per cubic meter (0.5 to 10 grains per cubic foot). This type of control is not feasible for controlling emissions from this source and will be excluded in this BACT analysis.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Wet Scrubber, 70% – 99% (~ 0.04 gr/dscf)
2. Mist eliminators

Step 4 – Evaluate the Most Effective Controls and Document Results

Wet Scrubber

The highest ranking control technology of wet scrubber is selected as BACT.

Based on a review of Title V permits, AMC is proposing BACT to be 0.07 lb/hr for total $PM_{10}/PM_{2.5}$ emissions or 0.0043 gr/dscf, using a wet scrubber.

Step 5 – Select BACT

BACT Limit Overview

AMC proposes BACT to be a wet scrubber for control of $PM/PM_{10}/PM_{2.5}$ emissions from the spray roaster. The proposed BACT emission limit for the spray roaster is 0.07 lb/hr for total $PM_{10}/PM_{2.5}$ emissions or 0.0043 gr/dscf.

1.2.7.2 SPRAY ROASTER NO_X BACT

The spray roaster has the potential to emit NOx emissions.

Step 1 – Identify Potential Control Technologies

The principle pollutant generated by combustion of natural gas is nitric oxide (NO) and nitrogen dioxide (NO_2), collectively referred to as NO_x. NO_x emissions produced during combustion are primarily from the thermal NO_x formation mechanism. Thermal NO_x results from the high temperature oxidation of nitrogen (N_2) and oxygen (O_2). Thermal NO_x formation is influenced by the flue gas residence time, excess oxygen, and primarily by temperature, becoming significant at temperatures above 2,800 ºF. The concentration of "thermal NO_x" is controlled by the nitrogen and oxygen molar concentrations and the temperature of combustion. Combustion at temperatures well below 1,300 ºC (2,370 ºF) forms much smaller concentrations of thermal NO_x.

The following technologies are potentially available controls for NO_x emission from the spray roaster.

TABLE 1-11 POTENTIAL CONTROL DEVICES FOR NO_X FROM SPRAY ROASTER

Control Type	Estimated NO_x Control Efficiency
SCR	70% -90%
NSCR	80% -90%
SNCR	40% -75%
Low-NO_x burners	40% -85%

The potential control devices to control NO_x emissions include the following:

- ***SCR***[52] - SCR units use a nitrogen-based reagent, such as ammonia (NH_3) or urea, to chemically reduce NO_x to molecular nitrogen and water vapor. The reagent is injected through a grid system into the flue gas stream, upstream of a catalyst bed. The waste gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst, where the reagent reacts selectively with NO_x within a specific temperature range.

  Operating temperatures between 480°F and 800°F are required of the gas stream at the catalyst bed, in order to carry out the catalytic reduction process. The greatest NO_x reduction occurs within a reaction window at catalyst bed temperatures between 600°F and 750°F for conventional catalysts and 470°F to 510°F for platinum based catalysts. The reaction of NH_3 and NO_x is favored by the presence of excess oxygen (greater than 1%). Depending on system design, NO_x removal rates of 70 to 90% are achievable under optimum conditions[53]. Technical factors related to this technology include the catalyst reactor design, optimum operating temperature, sulfur content of the charge, catalyst deactivation due to aging, ammonia slip emissions, and design of the ammonia injection system.

  Below the optimum temperature range, the catalyst activity is greatly reduced, potentially allowing unreacted ammonia (referred to as "ammonia slip") to be emitted directly to the atmosphere. SCR systems may also be subject to catalyst deactivation over time, due to physical deactivation and/or chemical poisoning. Catalyst suppliers typically guarantee a 3-year catalyst lifetime to achieve a specified emission limit.

  For an SCR system to effectively reduce NO_x emissions, the exhaust stream must have a relatively stable gas flow rate, NO_x concentration, and temperature profile.

- ***NSCR***[54] – NSCR is a post-combustion add-on exhaust gas treatment system for exhaust streams with a low O_2 content (between 1 to 2%). It is often referred to as a "three-way conversion" catalyst since it reduces NO_x, unburned hydrocarbons (UBH), and CO simultaneously. In order to operate properly, the combustion process must be stoichiometric or near-stoichiometric. Under stoichiometric conditions, in the presence of the catalyst, NO_x is reduced by CO, resulting in nitrogen and carbon dioxide. Operating temperatures between approximately 700°F and 1500°F are required of the gas stream in order to carry out the

52 Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR), EPA-452/F-03-032, Washington, D.C.: Clean Air Technology Center, July 2003.

53 USEPA ACT Document - NO_x Emissions from Iron and Steel Mills, Sept. 1994.

54 Draft CAM Technical Guidance Document: Nonselective Catalytic Reduction, EPA, April 2002. Available online at: https://www3.epa.gov/ttnchie1/mkb/documents/B_16a.pdf

catalytic reduction process. Depending on the temperature and oxygen concentration of the exhaust, NO_x removal rates of 80 to 90% are achievable.

- ***SNCR***[55]- SNCR is a post-combustion technique that involves injecting ammonia or urea into specific temperature zones in the upper furnace or, in other cases, connective pass of a boiler or process heater to reduce both NO_x and CO emissions. A temperature of between 1,600°F and 2,100°F is required at the injection site for the process reaction to take place. The ammonia or urea reacts with NO_x in the gas to produce molecular nitrogen and water vapor. The NO_x reduction reaction is favored over other chemical reaction processes for a specific temperature range and in the presence of oxygen; therefore, it is considered a selective chemical process. SNCR is effective only in a stoichiometric or fuel-rich environment where combustion gas is nearly depleted of oxygen.
- ***Low NOx Burners –*** Low NOx burners are modified combustion burners, designed to minimize NOx formation through low excess air firing, controlled mixing of primary combustion air and fuel, or reducing peak furnace temperature.

Step 2 – Eliminate Technically Infeasible Options

SCR

SCR is a post-combustion technology that reduces NO_x emissions by reacting NO_x with ammonia in the presence of a catalyst. SCR technology has been most commonly applied to larger boilers and to natural gas-fired combustion turbines and requires ductwork. Ductwork cannot be built for the spray roaster due to the specific design requirements. Ducting is not feasible, and therefore, SCR is not technically feasible.

NSCR

NSCR requires precise adjustments of process conditions such as oxygen content and temperature, and works best with certain windows of inlet concentration for NO_x, CO, and VOC. These operating windows are necessary because the catalyst was developed to react the NO_x, CO, and VOC with one another, reducing the emissions of each of these pollutants. NSCR has typically been used to control emissions from internal combustion engines and nitric acid plants. It is effective only in stoichiometric or fuel-rich environments where combustion gas is nearly depleted of oxygen (approximately 0.5% excess oxygen or less). The typical oxygen content of the exhausts from the spray roaster makes NSCR ineffective for these types of sources. Due to the oxygen content of the fuel, the lack of demonstrated applications for NSCR to industrial heaters and dryers, and operation outside of the optimal temperature range, this technology does not have the practical potential for application that would make it an available or technically feasible control technology.

SNCR

SNCR is a post-combustion NO_x control technology where ammonia or urea is injected into the exhaust to react with NO_x to form nitrogen and water without the use of a catalyst. Use of these SNCR requires uniform mixing of the reagent and exhaust gas within a narrow temperature range. Operations outside of these operating conditions will significantly reduce removal efficiencies and may result in ammonia emissions, increased NO_x emissions. No examples were found where SNCR

55 Air Pollution Control Technology Fact Sheet: Selective Non-Catalytic Reduction (SNCR), EPA-452/F-03-031, Washington, D.C.: Clean Air Technology Center, July 2003.

has been applied to a small natural gas burner. There is no appropriate temperature zone for SNCR application to the spray roaster. Therefore, SNCR is not technically feasible for the spray roaster.

For relatively small natural gas-fired sources, SCR, SNCR, and NSCR are technically infeasible and impractical due to the relatively small quantities of NO_X present in the exhaust gas.

Step 3 – Rank Remaining Technically Feasible Control Options

Low-NO_x Burners are the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

LNB

Low-NO_X burner (LNB) technology is the predominant control option identified in the RBLC for reducing NO_x emissions from commercial and institutional sized natural gas-fired burners for dryers and preheaters. Low-NO_x burners and good combustion practices were recently selected as BACT for small natural gas-fired preheaters. The spray roaster is different but similar to these small burners.

It is important to note that these burners will operate higher temperatures than those of a typical boiler that uses a convection heat transfer mechanism. Low-NO_x burners are applicable, economical, and will be employed for the spay roaster.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for small heaters and burners reveal that the most stringent limits for NO_x are achieved by use of low NO_x burners and good combustion practices. Indirect fired units are capable of lower NO_x limits, but are not as efficient or applicable. Generally, compliance with numerical NO_x limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel, and vendor guarantees.

AMC will use low-NO_x burners with an emission limit of 0.71 lb/hr (0.05 lb/MMBtu) from the spray roaster.

1.2.7.3 SPRAY ROASTER VOC BACT

The spray roaster has the potential to emit VOC emissions.

Step 1 – Identify Potential Control Technologies

VOC emissions from combustion result from incomplete combustion caused when some of the fuel is not completely burned or is only partially burned. The following technologies are potentially available control technologies for VOC emission controls for natural gas combustion sources.

TABLE 1-12 POTENTIAL CONTROL DEVICES FOR VOC FROM SPRAY ROASTER

Control Type	Estimated VOC Control Efficiency
Thermal oxidizer (afterburner)	98% -99+%
Recuperative thermal oxidizer	98% -99+%
Regenerative thermal oxidizer	95-99%
Catalytic oxidizer	90-99%
Clean fuel and good combustion practices	Base Case

The potentially applicable types of VOC controls are described in detail below:

- ***Thermal Oxidation***[56] - A thermal oxidizer is a large vessel with a burner where fuel, gaseous waste, and air are introduced and combined to achieve the required destruction removal efficiency (DRE). The mixture must be exposed to a sufficiently high temperature for an adequate time period in a relatively turbulent environment to enable the chemical reactions to reach the degree of completion needed to achieve the DRE.
- ***Recuperative or Regenerative Thermal Oxidation***[57,58] **-** Recuperative and regenerative thermal oxidizers (RTOs) are two types of oxidizers that are widely applied to control VOCs. Both include some form of internal heat recovery, designed to reduce the operating cost of the system related to the consumption of a fuel source (typically natural gas) to raise the incoming gas temperature up to a combustion temperature within the burner zone as necessary to achieve the desired DRE. Heat recovery may either be recuperative or regenerative. In recuperative heat recovery, heat is recovered by passing the hot exhaust gases through a non-contact air-to-air heat exchanger, to heat the incoming air to the oxidizer. In regenerative heat recovery, hot exhaust gases and cool inlet gases are alternatively passed through a fixed bed, typically employing ceramics. RTOs have the ability to achieve a DRE of up to 99%, depending on the VOC inlet concentration.
- ***Catalytic Oxidation –*** Catalytic oxidizers use a bed of catalyst that facilitates the overall combustion of combustible gases. The catalyst increases the reaction rate and allows the conversion of CO and VOC to CO_2 at lower temperatures than a thermal oxidizer. The catalyst is typically a porous noble metal material that is supported in individual compartments within the unit. An auxiliary fuel-fired burner ahead of the bed heats the entering exhaust gases to 600°F to maintain proper bed temperature. Recuperative heat exchangers are used to recover the exiting exhaust gas heat and reduce the auxiliary fuel consumption. Exhaust gas temperatures that are too high may cause permanent damage to the catalyst, while operating temperatures that are too low may result in a lower VOC conversion efficiency. The typical VOC removal efficiency of a catalytic oxidation system is 90% or greater. The catalytic oxidation process for VOC control is very temperature sensitive.

56 Air Pollution Control Technology Fact Sheet: Thermal Incinerator, EPA-452/F-03-022, Washington, D.C.: Clean Air Technology Center, July 2003.
57 Air Pollution Control Technology Fact Sheet: Incinerator – Recuperative Type, EPA-452/F-03-020. Washington, D.C.: Clean Air Technology Center, July 2003.
58 Air Pollution Control Technology Fact Sheet: Regenerative Incinerator, EPA-452/F-03-021. Washington, D.C.: Clean Air Technology Center, July 2003.

- ***Clean Fuel and Good Combustion Practices*** - The use of natural gas as a combustion fuel, in preference over other fossil fuels such as oil or coal, results in fewer VOC emissions per unit of energy output. Natural gas also has benefits over other fossil fuels from the perspective of potentially generating other criteria pollutant emissions, such as SO_X. The use of good combustion practices can minimize the potential VOC emissions associated with incomplete combustion. Good combustion practices typically entail introducing the proper ratio of combustion air to the fuel, maintaining a minimum temperature in the firebox of the combustor, or a minimum residence time of fuel and air in the combustion zone. By employing good combustion practices, VOC emissions may be greatly reduced.

Step 2 – Eliminate Technically Infeasible Options

Thermal Oxidizer (Afterburner), Recuperative Thermal Oxidizer, and Regenerative Thermal Oxidizer

Thermal oxidation, recuperative thermal oxidation, and regenerative thermal oxidation is technically infeasible because it would involve more combustion following already highly efficient combustion. Further, thermal oxidation would increase combustion emissions and require additional fuel use (wasted energy). The VOC emissions from the annealing furnace are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for the natural gas-fired annealing furnace.

Catalytic Oxidizer

Catalytic oxidation is a post-combustion control technology that utilizes a catalyst to oxidize VOC into CO_2 or water (H_2O). The technology has most commonly been applied to natural gas fired combustion turbines. No examples were identified where add-on control technology has been applied to small natural gas-fired burners. Because of the low quantities of VOC emissions, the use of catalytic oxidation technology is determined to be not feasible.

For relatively small natural gas-fired sources, post-combustion controls, such as thermal oxidizers, recuperative incinerators, regenerative incinerators, and catalytic oxidizers are technically infeasible and impractical due to the relatively small quantities of VOC present in the exhaust gas. The VOC emissions from the annealing furnace are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for the natural gas-fired annealing furnace.

Step 3 – Rank Remaining Technically Feasible Control Options

1. Clean Fuel (Natural Gas) and Good Combustion Practices

Step 4 – Evaluate Remaining Control Technologies

Clean Fuel and Good Combustion Practices

Add-on controls, even if feasible, are not typically required for small combustion sources fired with natural gas. During the review of available control technologies for combustion sources at similar facilities, no determinations were found for the use of add-on controls to reduce VOC emissions from small natural gas-fired equipment. Therefore, AMC proposes that BACT for VOC emissions from combustion sources be limited to the use of natural gas (a clean-burning fuel with low VOC emissions), good combustion practices, and numerical emissions limits of 0.0054 lb/MMBtu VOC.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for small heaters and burners reveal that the most stringent limits for VOC are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for VOC from AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources, Section 1.4 - Natural Gas Combustion, are typically used to establish numerical limits. Generally, compliance with numerical VOC limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel and certification of good combustion practices.

AMC will utilize clean fuel (natural gas) and good combustion practices, and numerical emissions limits of 0.0054 lb/MMBtu VOC as BACT for VOC emissions from the spray roaster. This limit is equivalent to average hourly VOC emissions of 0.07 lb/hr.

Compliance will be demonstrated through natural gas combustion records and certification of good combustion practices. Examples of good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

1.2.7.4 SPRAY ROASTER GHG BACT

CO_2e emissions from the proposed spray roaster will result from the combustion of natural gas. In a properly tuned heater, a majority of the fuel carbon in natural gas is converted to CO_2 during the combustion process. Even burners operating with poor combustion efficiency produce minimal amounts of CH_4, CO, and VOC compared to CO_2 levels. Thus, the following control analysis focuses on CO_2 emissions.

Step 1 – Identify Potential Control Technologies

Potential control options are identified for CO_2 below. Because the primary GHG emitted by the proposed projects in this permit application is CO_2, the control technologies and measures presented in this section focus on CO_2 control technologies.

- ***Carbon Capture and Sequestration*** - Carbon capture and sequestration (CCS) is the long-term isolation of fossil fuel CO_2 emissions from the atmosphere through capturing and storing the CO_2 deep in the subsurface of the earth. CCS is the only potentially available add-on control option to reduce large-scale direct emissions from industrial processes.[59] CCS is made up of three key stages:
  1. Capture: Carbon capture is the separation of CO_2 from other gases produced when fossil fuels are combusted. Post-combustion CO_2 separation can be performed with chemical absorption systems using aqueous solution of amines as chemical solvents, or physical absorption systems using methanol or other solvents.
  2. Transport: After separation, CO_2 is compressed to facilitate transportation and storage if a locally available site for direct injection is unavailable. After compression, CO_2 is transported utilizing a third-party CO_2 pipeline system to transport CO_2 to distant geologic

[59] https://archive.epa.gov/epa/climatechange/carbon-dioxide-capture-and-sequestration-overview.html

formations that may be more conducive to sequestration than sites in the immediate area. Building such a pipeline for dedicated use by a single facility will certainly make any project economically infeasible, from both an absolute and BACT-review perspective. However, such an option may be effective only if both adequate storage capacity exists downstream and reasonable transportation prices can be arranged with the pipeline operator.

3. Storage: At a storage site, CO_2 is injected into deep underground rock formations, often at depths of one (1) km or more. Appropriate storage sites include depleted oil fields, depleted gas fields, rock formations that contain a high degree of salinity (saline formations). These potential sites must be evaluated to ensure they can store CO_2 safely and securely. At the site, the CO_2 is injected underground into solid, but porous rock such as sandstone, shale, dolomite, or basalt. These formations must be located under at least one layer of cap rock to prevent upward migration of the CO_2. Monitoring, reporting, and verification are important to demonstrate that CO_2 is safely stored.

- ***Energy Efficiency Measures***– Thermal efficiency is an emissions reduction strategy focused on increasing energy efficiency. Energy efficient process reduce the amount of fuel consumed. Reductions in fuel consumption result in reductions of direct emissions of GHGs at the steel mill, and reductions in electricity usage result in reductions of indirect GHG emissions. Many operating practices affect source energy efficiency including stirring method, addition of oxy-fuel burners, foamy slag, and variable speed drives.

Step 2 – Eliminate Technically Infeasible Options

Carbon Capture and Sequestration

Having a technically feasible carbon capture technology that is based on removing CO_2 in the gaseous form but that does not include viable long-term storage or a CO_2 transport system to move captured CO_2 to the storage site will not accomplish the goal of removing CO_2 from the atmosphere. Therefore, for CCS technology to be considered a technically feasible control option for consideration as BACT, carbon capture, carbon transport, and carbon storage must all be examined and deemed both available and technically feasible for the proposed source.

Carbon Capture

According to the Global CCS Institute[60], Abu Dhabi CCS is the world's first commercial CCS facility in the iron and steel industry at the Emirates Steel Industries factory in Mussafah with a capture capacity of 0.8 million metric tons per year of CO_2 from direct reduced iron (DRI). The DRI process produces a pure stream of CO_2 (greater than 98 percent), which was originally vented to the atmosphere. The project scope includes operation of a greenfield CO_2 Compression Facility (CCF) including dehydration, adjacent to the facility. CO_2 is transferred at low pressure to the CCF. At the CCF, CO_2 is dehydrated, compressed, metered, and exported to a CO_2 pipeline. CO_2 is then transported through an eight inch pipeline for EOR purposes. Although this project is associated with the Iron and Steel Production Industry, none of the proposed project emission sources at AMC have similar exhaust characteristics, nor will any of the exhaust streams consist of pure CO_2. The spray roaster will contain other products of combustion, making the exhaust stream not suitable for CCS; therefore, there is no specific evidence that there is a commercially available

60 Global CCS Institute, Canberra, Australia, May 2018. Project status available on-line at: http://www.globalccsinstitute.com/projects/abu-dhabi-ccs-project-phase-1-being-emirates-steel-industries-esi-ccs-project

carbon capture system of the scale that would be required to control the CO_2 emissions for the proposed source.

Carbon Storage

The small and large-scale CO_2 storage projects identified by National Energy Technology Laboratory,[61] have not yet reached the licensing and commercial stage of development. Indeed, these projects are being undertaken in public-private partnership arrangements, with significant financial support being provided by the Department of Energy. Moreover, the stated purpose of the large-scale projects is to "validate that CCS can be conducted at a commercial scale." In fact, the relatively small storage capacities of these projects (the largest of which is approximately 5 million metric tons) suggests that they are being conducted at a pilot scale. Technologies in the pilot scale testing stages of development are not considered "available" technologies. Because these pilot scale projects have not yet reached the licensing and commercial stage of development, permanent geological sequestration of CO_2 is not an available technology and has not been demonstrated for spray roasters.

Dedicated geological sequestration of CO_2 requires close proximity to a favorable geologic formation. Options for permanent sequestration of CO_2 in proximity of the proposed facility that could accommodate the amount of CO_2 generated from the proposed facility could not be found. Further, extensive characterization studies would be needed to determine the extent and storage potential for CO_2 in geological formations near the proposed facility. These studies would take several years of investigation, including drilling characterization wells, and would likely require small-scale injection testing before determining their full-scale viability.

Step 3 – Rank Remaining Technically Feasible Control Options

As CCS is considered to be technically infeasible, energy efficiency measures are the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

Energy Efficient Design

In a direct-fired burner, gas is fed directly to the burner, while an airstream provides the needed oxygen for combustion. Nearly 100% of the fuel is converted to heat, with an overall thermal efficiency around 92%. Therefore, fuel consumption and operating costs are reduced when compared to an indirect-fired unit. Furthermore, direct-fired heaters can be constructed to essentially any required size, and the facility does not have to opt for an oversized heater. Additionally, direct-fired heaters have a much higher turndown ratio than indirect-fired heaters, resulting in a greater ability to vary the heat output.

Step 5 – Selection of BACT

For CO_2e emissions generated from the spray roaster, BACT is selected to be energy efficient design. No adverse energy, environmental, or economic impacts are associated with this control option. Compliance will be demonstrated through natural gas usage records. CO_2e from the spray

[61] National Energy Technology Laboratory National Carbon Sequestration Database and Interactive Viewer, available online at: https://www.netl.doe.gov/research/coal/carbon-storage/natcarb-atlas

roaster will be limited to 1,518.47 lb/hr and 6,650.92 tpy, based on the default emission factors from 40 CFR Part 98 Subpart C, Tables C-1 and C-2 for natural gas.

1.2.8 BACT DETERMINATION FOR ANNEAL AND COATING LINE – CLEANING SECTION

This section evaluates BACT for the new anneal and coating line – cleaning section being proposed by this project.

Anneal and Coating Line – Cleaning Section

The continuous strip passes first through a cleaning section to remove the iron fines and oils that remain on the strip after cold rolling. The strip is cleaned with an alkaline degreasing solution (NaOH and demineralized water) in a series of sprays, brushes, and electrolytic cleaning tanks.

1.2.8.1 ANNEAL AND COATING LINE – CLEANING SECTION PM/PM_{10}/$PM_{2.5}$ BACT

The anneal and coating line – cleaning section has the potential to emit a small amount of PM/PM_{10}/$PM_{2.5}$ emissions.

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the anneal and coating line – cleaning section was developed.

TABLE 1-13 POTENTIAL CONTROL DEVICES FOR PM_{10}/$PM_{2.5}$ FROM ANNEAL AND COATING LINE – CLEANING SECTION

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency
ESP	95-99+% (0.002 – 0.004 gr/dscf)
High efficiency cyclone	80-99% for PM, 30-90% for PM10, 0-40% for PM2.5 (>0.01 gr/dscf)
Wet scrubber or high efficiency Venturi scrubber	70-99% (~0.01 gr/dscf)
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
Mist eliminator	70-99% (~0.01-0.003 gr/dscf)

Each of the potentially applicable controls is described below.

- ***ESPs***[62, 63] - ESPs use an electrostatic field to charge particles contained in the gas stream. The charged particles migrate to a grounded collection surface where they are periodically dislodged by vibrating or rapping. The dust is collected in a hopper at the bottom of the ESP. With respect to $PM_{2.5}$ emissions, dry ESPs have a lower overall efficiency than baghouses. Dry ESPs are not designed to collect wet or sticky PM, such as condensable particles. Condensable

62 Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-027, Washington, D.C.: Clean Air Technology Center, July 2003.

63 Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-029, Washington, D.C.: Clean Air Technology Center, July 2003.

matter will clog the ESP, stay attached to the plates, and possibly short out the unit. However, wet electrostatic precipitators (WESPs) can collect sticky particles and mists, as well as highly resistive or explosive dusts. The humid atmosphere that results from the continuous or intermittent washing in a wet ESP enables these units to collect high resistivity particles, absorb gases or cause pollutants to condense, and cool and condition the gas stream. Liquid particles or aerosols present in the gas stream are collected along with particles and provide another means of rinsing the collection electrodes.

- ***High Efficiency Cyclones***[64] – This type of particulate control technology (such as a cyclone) is typically utilized to remove large particles (greater than 8 to 10 microns [μm] in aerodynamic diameter) through centrifugal and inertial forces induced by mechanically accelerating the particle-laden gas stream. This type of control is not effective in removing small particles – achieving approximately 30% control efficiency for PM_{10}.
- ***Wet Scrubbers***[65, 66] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing PM_{10}/$PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.
- ***Fabric Filters***[67] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level. The design efficiency of dry filtration typically ranges between 0.001 to 0.01 gr/dscf.
- ***Mist Eliminators***[68] **-** Fiber-bed scrubbers or mist eliminators are capable of control efficiencies ranging from 70% to 99%, depending on exhaust stream characteristics and size of aerosols. Insoluble PM will clog the fiber-bed filter over time; therefore, fiber-bed filters have a limited commercial acceptance for dust collection. Fiber-bed scrubbers can treat exhaust streams with flow rates ranging from 1,000 scfm to 100,000 scfm and temperatures

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64 Air Pollution Control Technology Fact Sheet: Cyclones, EPA- 452/F-03-005, Washington, D.C.: Clean Air Technology Center, July 2003.

65 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

66 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

67 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

68 Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

up to 140°F. For mist eliminators to be considered effective at reducing $PM/PM_{10}/PM_{2.5}$ emissions, the inlet loading must be at least 0.1 gr/dscf.

Step 2 – Eliminate Technically Infeasible Control Technologies

ESPs

ESPs are not suitable for use in variable processes because they are sensitive to fluctuations in gas stream conditions (flow rates, temperatures, particulate, gas composition and particulate loadings). ESPs must also be relatively large to obtain the low gas velocities necessary for efficient PM collection. Review of RBLC and electronic versions of permits available at the websites of other permitting agencies did not identify any baghouses used to control PM emissions from similar emission sources. Thus, based on the above limitations and the low emission rates for this source, this control was excluded from further consideration in this BACT analysis.

High Efficiency Cyclone

In addition to the fact that high efficiency cyclones are typically used to remove larger particles, no BACT determinations were found that include the use of high efficiency cyclones or mechanical collectors, so this type of control is considered technically infeasible for removing fine PM emissions. Mechanical collectors are used primarily for pretreatment control devices and are not considered a "best" available control technology; for these reasons, this control technology is eliminated from further consideration.

Fabric Filter (Baghouse)

High Fabric filters are applicable to sources that generate dust and can be captured and ducted to a central location. Typical inlet concentrations to baghouse are 1 to 23 grams per cubic meter (0.5 to 10 grains per cubic foot). Baghouses are not designed for wet media and the resulting moisture/particulate combination would cause blinding of the bags. This type of control is not feasible for controlling PM emissions from this source and will be excluded in this BACT analysis.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Mist eliminators
2. Wet Scrubber, 70% – 99% (~ 0.01 gr/dscf)

Step 4 – Evaluate the Most Effective Controls and Document Results

Mist eliminators are part of the group of air pollution controls referred to as wet scrubbers[69]. They remove between 70% and 99% of the liquid droplets from the waste gas stream. There are two basic designs, chevron, and mesh pad mist eliminators. The droplets collect and coalesce on the chevron blades or mesh. When the droplets become large enough, they fall by gravity or capillary action. All mist eliminators require periodic washing to remove buildup of PM. Mist eliminators are used to remove large condensed droplet from a gas stream and will be considered for mist control in this BACT evaluation.

Step 5 – Select BACT

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69 Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

A review of the RBLC identified a similar source, Degreasing, for Outokumpu Stainless USA, LLC, in Calvert, Alabama, which has a permitted limit of 0.0022 gr/dscf using a wet scrubber. However, this source has not being tested and proven.

AMC proposes BACT for the cleaning section as mist eliminators with a limit of 0.003 gr/dscf to reduce filterable PM/PM_{10}/$PM_{2.5}$ emissions. This is equivalent to 0.38 lb/hr filterable PM/PM_{10}/$PM_{2.5}$ emissions.

1.2.9 BACT DETERMINATION FOR COOLING TOWER

This section evaluates BACT for the new contact-cooling tower being proposed by this project.

Cooling Tower

Cooling towers have the potential to emit a small amount of PM/PM_{10}/$PM_{2.5}$ emissions when water droplets escape. When the droplets evaporate from the cooling tower, dissolved solids in the water are emitted particulate. All particulate emissions from the cooling tower will be filterable.

1.2.9.1 COOLING TOWER PM/PM_{10}/$PM_{2.5}$ BACT

PM/PM_{10}/$PM_{2.5}$ is emitted from the cooling tower.

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the cooling tower was developed. Drift loss rates from wet cooling systems are affected by a variety of factors, including the type and design of the cooling system, capacity, velocity of air flow, density of the air in the cooling tower, and the total dissolved solids (TDS) concentration in the circulating water.

TABLE 1-14 POTENTIAL CONTROL DEVICES FOR PM_{10}/$PM_{2.5}$ FROM COOLING TOWER

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency
High efficiency drift eliminators	Varies
Proper equipment design, operation, and maintenance	Base Case

Each of the potentially applicable controls is described below.

- ***High Efficiency Drift Eliminators*** - High efficiency drift eliminators remove entrained water droplets from the air, thus, reducing PM, PM_{10}, and $PM_{2.5}$ emissions. Types of drift eliminators include herringbone (blade-type), wave form, and cellular (or honeycomb) designs. Drift eliminator system materials of construction may include ceramics, fiber reinforced cement, fiberglass, metal, plastic, or wood. Typically, drift eliminators are constructed of polyvinyl chloride plastic material, which effectively eliminates corrosion. Drift eliminators also incorporate ultraviolet inhibitors to resist cracking and degradation due to sunlight. Drift eliminator system designs may include other features, such as corrugations and water removal channels, to enhance the drift removal further. The drift rate as a percentage of circulating water flow rates varies with the specific project, and typically ranges from 0.01 to

0.0005% of circulating water flow rates. Higher efficiency drift eliminators can achieve drift loss rates of 0.005% to 0.0005% of the circulating water flow rates.

- ***Proper Equipment Design, Operation, and Maintenance*** - Proper equipment design, operation, and maintenance can help ensure the drift eliminators work properly to maximize PM, PM_{10}, and $PM_{2.5}$ reduction.

Step 2 – Eliminate Technically Infeasible Control Technologies

All proposed controls in Step 1 are technically feasible.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Use of high efficiency drift eliminators, as low as 0.0005% of circulating flow.
2. Proper equipment design, proper operation, and good maintenance practices.

Step 4 – Evaluate the Most Effective Controls and Document Results

As previously discussed, there is a loss of water to the environment due to the evaporative cooling process. A drift eliminator is designed to capture the water droplets; thus, controlling the amount of total liquid drift. Drift eliminators cause the droplets to change direction and lose velocity at impact on the blade walls and fall back into the cooling tower. A review of the RBLC database and several other recently permitted cooling towers throughout the U.S. indicates that a high efficiency drift eliminator, achieving a drift rate of 0.0005% is BACT for $PM/PM_{10}/PM_{2.5}$ emissions from a cooling tower.

Use of High Efficiency Drift Eliminators

A drift loss of 0.0005% is appropriate as BACT and is consistent with recent BACT determinations in the RBLC. High efficiency drift eliminators are the top available control and do not have any adverse environmental or economic impacts. Therefore, additional analysis is not required.

Step 5 – Select BACT

BACT Limit Overview

In the RBLC, BACT for cooling towers at certain energy centers, power plants, and refineries is selected as drift eliminators with a drift rate of 0.0005% instead of the typical drift rate of 0.001%. According to RBLC search results, the typical circulating water rate associated with these units at energy-related facilities is over 100,000 gallons per minute (gpm); for example, Okeechobee Clean Energy Center's Mechanical Draft Cooling Tower with a flow rate of 465,815 gpm. The circulation rates associated with the proposed cooling tower (10,000 gpm) are well below the circulating rates energy-related facilities (over 100,000 gpm).

AMC proposes to use a cooling tower equipped with high-efficiency drift eliminators that will achieve a drift rate of 0.0005%, which is the most effective technique to reduce $PM/PM_{10}/PM_{2.5}$ emissions. The proposed emission limits are 0.08 lbr/hr PM, 0.05 lb/hr PM_{10}, and 0.0002 lb/hr $PM_{2.5}$.

Compliance will be demonstrated by drift eliminator vendor specifications.

1.2.10 BACT DETERMINATION FOR THE EMERGENCY DIESEL GENERATOR

The proposed facility will include one new 2,000 kW emergency diesel generator and one new 250 kW emergency diesel generator to generate electricity to operate critical systems when power is not otherwise available. The emergency diesel generators are intended to operate for emergency situations and expected to operate no more than 500 hours per year. The emergency diesel generators will combust diesel fuel and have emissions of PM, PM_{10}, $PM_{2.5}$, NO_X, VOC and GHGs. The BACT for these pollutants is addressed in this section.

The emergency engines are subject to 40 CFR 63 Subpart ZZZZ which requires compliance with 40 CFR 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. This subpart requires the manufacturer to meet stringent emission limits for PM, PM_{10}, $PM_{2.5}$, NO_X, VOC and GHGs depending on engine size. 40 CFR 60 Subpart IIII implement Section 111(b) of the Clean Air Act and Section 111 of the CAA states that Section 111 of the CAA states that a standard of performance "means a standard which reflects the degree of emission limitation achievable through application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."[70] As such, the NSPS already incorporates the Best Demonstrated Technologies (BDT) identified by EPA for control of emissions from such sources. Further, in the preamble to 40 CFR 60 Subpart IIII, EPA clearly states that use of add-on controls such as CDPF, oxidation catalyst, and NO_X adsorber could not be justified as BDT due to the cost of the technology relative to the emission reduction that would be obtained.[71] The EPA, therefore, determined that the engine technologies developed by engine manufacturers to meet the Tier 2 and Tier 3 nonroad diesel engine standards, and those Tier 4 standards that do not require aftertreatment, are the BDT for 2007 model year and later emergency stationary CI ICE with a displacement of less than 10 liters per cylinder.[72]

In accordance with 40 CFR 60.4202(a) and (b), the proposed emergency diesel generator with a power rating of 2,000 kW must meet the Tier 2 emission standards for engines with a power rating greater than 560 kW and the proposed emergency diesel generator with a power rating of 250 kW must meet the Tier 3 standards for engines between 225 kW and 450 kW. In addition, the engines will be required to burn ultra-low sulfur diesel fuel that meets the requirements of 40 CFR 80.510(b), including standards for sulfur content.

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70 70 FR 39872 (July 11, 2005)
71 70 FR 39874 (July 11, 2005).
72 Ibid.

TABLE 1-15 BACT LIMITS FOR EMERGENCY ENGINES

Source	Non-methane hydrocarbon (NMHC) + NO_x (g/kW-hr)	NO_x (lb/hr)	Filterable $PM/PM_{10}/PM_{2.5}$ (g/kW-hr)	Filterable $PM/PM_{10}/PM_{2.5}$ (lb/hr)	Condensable PM (lb/hr)	CO_2e (lb/hr)
2,000 kW Emergency Diesel Generator	6.4	37.63	0.2	1.18	0.03	205
250 kW Emergency Engine	4.0	2.94	0.2	0.15	0.003	26

1.2.10.1 EMERGENCY GENERATOR $PM/PM_{10}/PM_{2.5}$ BACT

Particulate emissions are best controlled by utilizing fuels with low sulfur and ash content, using good combustion practices, and complying with the requirements of NSPS Subpart IIII. Particulate emissions from the engines are low to begin with, making add-on controls impractical.

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential $PM/PM_{10}/PM_{2.5}$ controls for the emergency diesel generators includes:

- Clean fuel;
- Good combustion practices;
- Use of ultra low sulfur diesel (ULSD) fuel;
- Limitations on hours of operation; and
- Catalyzed diesel particulate filter (CDPF).

Step 2 – Eliminate Technically Infeasible Options

All of the potential control technologies discussed in Step 1 are technically feasible.

Step 3 – Rank Remaining Technically Feasible Control Options

A catalyzed diesel particulate filter can achieve up to 85% control for particulates.

Step 4 – Evaluate Remaining Control Technologies

Due to the fact that the emergency diesel generators will have low emissions of $PM/PM_{10}/PM_{2.5}$, compounded with the fact that they will be restricted to 500 hours per year of operation, makes post combustion controls such as a CDPF economically infeasible. Table 1-15 provides an economic evaluation for CDPF.

TABLE 1-16 ECONOMIC EVALUATION FOR CDPF

Engine Size	CDPF Cost Effectiveness $/ton[73]
2,000 kW	123,030
250 kW	166,291

Step 5 – Selection of BACT

Good combustion practices, use of ULSD clean fuel, and limiting the operating hours for the emergency diesel generators is proposed as BACT. These limits will be set to the emission limits required by NSPS IIII which are obtained through proper operation and maintenance of an EPA certified engine. A summary of these emission limits is shown in Table 1-14.

1.2.10.2 EMERGENCY GENERATOR NO_X BACT

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential NOx controls for the emergency generator includes:

- Purchase of certified NSPS IIII engine;
- Good combustion practices;
- Limitations on hours of operation; and
- SCR.

Step 2 – Eliminate Technically Infeasible Options

All of the potential control technologies discussed in Step 1 are technically feasible.

Step 3 – Rank Remaining Technically Feasible Control Options

An SCR can achieve up to 90% control for NOx.

Step 4 – Evaluate Remaining Control Technologies

Due to the fact that the emergency generator will have low emissions of NOx, compounded with the fact that it will be restricted to 500 hours per year of operation, makes post combustion controls such as an SCR economically infeasible. Table 1-16 provides an economic evaluation for SCR.

TABLE 1-17 ECONOMIC EVALUATION FOR SCR

Engine Size	SCR Cost Effectiveness $/ton[74]
2,000 kW	25,383

[73] EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*
[74] EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

Engine Size	SCR Cost Effectiveness $/ton[74]
250 kW	25,417

Step 5 – Selection of BACT

Good combustion practices and limiting the operating hours for the emergency diesel generators is proposed as BACT. These limits will be set to the emission limits required by NSPS IIII which are obtained through proper operation and maintenance of an EPA certified engine. A summary of these emission limits is shown in Table 1-14.

1.2.10.3 EMERGENCY DIESEL GENERATORS VOC BACT

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential VOC controls for the emergency diesel generators includes:

- Purchase of certified NSPS IIII engine;
- Good combustion practices;
- Limitations on hours of operation;
- Diesel oxidation catalysts (DOC); and
- CDPF.

Step 2 – Eliminate Technically Infeasible Options

All of the potential control technologies discussed in Step 1 are technically feasible.

Step 3 – Rank Remaining Technically Feasible Control Options

A DOC or CDPF can achieve up to 90% control for VOC.

Step 4 – Evaluate Remaining Control Technologies

Due to the fact that the emergency diesel generators will have low emissions of VOC, compounded with the fact that they will be restricted to 500 hours per year of operation, makes post combustion controls such as a DOC or CDPF economically infeasible. Table 1-17 provides an economic evaluation for a DOC and a CDPF.

TABLE 1-18 ECONOMIC EVALUATION FOR DOC AND CDPF

Engine Size	DOC Cost Effectiveness $/ton[75]	CDPF Cost Effectiveness $/ton[37]
2,000 kW	16,316	13,894
250 kW	24,581	33,428

[75] EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

Step 5 – Selection of BACT

Good combustion practices and limiting the operating hours for the emergency diesel generators is proposed as BACT. These limits will be set to the emission limits required by NSPS IIII which are obtained through proper operation and maintenance of an EPA certified engine. A summary of these emission limits is shown in Table 1-14.

1.2.10.4 EMERGENCY DIESEL GENERATORS GHG BACT

GHG emissions from the emergency diesel generators result from the oxidation of fuel carbon. This evaluation does not identify and discuss each of the five individual steps of the "top-down" BACT process as there are no post-combustion control technologies identified or available for GHG emissions from emergency diesel engines. The proposed BACT for GHG emissions from the emergency engines is to follow good combustion practices, the use of ULSD, limiting hours of operation and proper operation and maintenance consistent with NSPS Subpart IIII.

1.2.11 BACT DETERMINATION FOR OVENS

This section evaluates BACT for the new ovens being proposed by this project. Natural gas combustion in the units will result in emissions of PM/ PM_{10}/ $PM_{2.5}$, NO_x, VOC, and GHGs.

Ovens

The strip passes through the roll coaters, where the liquid varnish is applied to the surface of the strip, and then into the curing oven. The coating is dried and cured at the required temperature, and the solvents are evaporated. The coated strip is cooled with air, and then passes into the exit section with inspection and measurement of strip quality before being rewound into coils.

The curing oven is heated with direct-fired natural gas burners. The contaminated exhaust air from the curing section and the coater room is processed through the Regenerative Thermal Oxidizer (RTO). The RTO destroys the Volatile Organic Carbon (VOC) and Hazardous Air Pollutants (HAP) by reaction with oxygen at a controlled temperature. The RTO is equipped with natural gas burners to maintain the required temperature.

1.2.11.1 OVENS PM/PM_{10}/$PM_{2.5}$ BACT

The ovens have the potential to emit PM/PM_{10}/$PM_{2.5}$ emissions.

Step 1 – Identify Potential Control Technologies

PM emissions from combustion are primarily the result of incomplete combustion, though PM emissions are also produced from the carryover of noncombustible trace constituents in the fuel (such as ash and metallic additives). Natural gas contains a very small amount of noncombustible trace constituents that result in PM/ PM_{10}/ $PM_{2.5}$ emissions. The following technologies are potentially available control technologies for PM/PM_{10}/$PM_{2.5}$ emission controls for natural gas-fired combustion sources. There should not be additional PM emissions generated from combusted coating and solvent fumes.

TABLE 1-19 POTENTIAL CONTROL DEVICES FOR PM/PM_{10}/$PM_{2.5}$ FROM OVENS

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
Wet scrubber or high efficiency venturi scrubber	70% to 99% (<0.01 gr/dscf)
ESP	>98%(0.004 – 0.01 gr/dscf)
Clean fuel and good combustion practices	Base Case

The potentially applicable types of particulate control systems are described in detail below.

- ***Fabric Filters***[76] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level. The design efficiency of dry filtration typically ranges between 0.001 to 0.01 gr/dscf.
- ***Wet Scrubbers***[77, 78] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing PM_{10}/$PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.
- ***ESPs***[79, 80] - ESPs use an electrostatic field to charge particles contained in the gas stream. The charged particles migrate to a grounded collection surface where they are periodically dislodged by vibrating or rapping. The dust is collected in a hopper at the bottom of the ESP. With respect to $PM_{2.5}$ emissions, dry ESPs have a lower overall efficiency than baghouses. Dry ESPs are not designed to collect wet or sticky PM, such as condensable particles. Condensable

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76 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

77 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

78 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

79 Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-027, Washington, D.C.: Clean Air Technology Center, July 2003.

80 Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-029, Washington, D.C.: Clean Air Technology Center, July 2003.

matter will clog the ESP, stay attached to the plates, and possibly short out the unit. However, wet electrostatic precipitators (WESPs) can collect sticky particles and mists, as well as highly resistive or explosive dusts. The humid atmosphere that results from the continuous or intermittent washing in a wet ESP enables these units to collect high resistivity particles, absorb gases or cause pollutants to condense, and cool and condition the gas stream. Liquid particles or aerosols present in the gas stream are collected along with particles and provide another means of rinsing the collection electrodes.

- ***Clean Fuel and Good Combustion Practices*** - Fuels containing ash have the potential to produce particulate emissions. Additionally, fuels containing sulfur have the potential to produce sulfur compounds that may form condensable particulate emissions. Natural gas contains negligible amounts of particulate and is considered a low sulfur fuel. The use of good combustion practices can minimize the potential particulate emissions associated with incomplete combustion.

Step 2 – Eliminate Technically Infeasible Options

Baghouses

A baghouse is a post-combustion control technology that utilizes a fine mesh filter to remove particulate emissions primarily from large volume gas streams containing high particulate concentrations. No examples have been found where a baghouse has been applied to a small natural gas fired ovens due to the reduced volume and minimal particulate concentration of the associated exhaust gas stream. The PM emissions from the ovens are below the outlet concentration typically guaranteed for this control device. Therefore, baghouse technology is not technically feasible for the ovens.

Wet Scrubbing

No examples have been found where a scrubber has been applied to a similar natural gas-fired heater due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. Wet scrubbers remove PM from a gas stream by capturing it in liquid droplets. Wet scrubbers are not well suited for use on extremely fine particles and are generally ineffective collection devices for submicron particles. The particulate emissions from the ovens will be a result of natural gas combustion and are less than 1 micrometer. The PM emissions from the ovens are below the outlet concentration typically guaranteed for this control device. Therefore, wet scrubber technology is not technically feasible for the ovens.

ESPs

Electrostatic precipitation is a post-combustion particulate emissions control most readily applied to large volume gas streams containing high particulate concentrations. No examples have been found where an ESP or WESP has been applied to a small natural gas fired ovens due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. Therefore, ESP is not technically feasible for the ovens.

Post-combustion controls, such as baghouses, scrubbers, and ESPs are technically infeasible due to the high pressure drops associated with these units and the low concentrations of PM/PM_{10}/$PM_{2.5}$ present in the exhaust gas. The PM emissions from the ovens are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for the ovens.

Step 3 – Rank Remaining Technically Feasible Control Options

Clean Fuel (Natural Gas) and Good Combustion Practices are the only remaining technically feasible control options.

Step 4 – Evaluate Remaining Control Technologies

Clean Fuel and Good Combustion Practices

During the review of available control technologies for combustion sources at similar plants, no determinations were found for the use of add-on controls to reduce $PM/PM_{10}/PM_{2.5}$ emissions from small natural gas-fired ovens. Therefore, AMC considers BACT for the ovens to be the use of natural gas, a clean-burning fuel with low $PM/PM_{10}/PM_{2.5}$ emissions, and good combustion practices. Use of natural gas and good combustion practices are applicable, economical, and will be employed for the ovens. Good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for small heaters and burners reveal that the most stringent limits for $PM/PM_{10}/PM_{2.5}$ are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for $PM/PM_{10}/PM_{2.5}$ from AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources, Section 1.4 - Natural Gas Combustion, are typically used to establish numerical limits. Generally, compliance with numerical $PM/PM_{10}/PM_{2.5}$ limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel.

AMC proposes to use clean fuel (natural gas) and good combustion practices, and a numerical limit of 1.9 pounds per million standard cubic feet (lb/MMscf) for PM (filterable) and 7.6 lb/MMscf $PM_{10}/PM_{2.5}$ as BACT for the ovens. These limits are equivalent to average hourly emissions for filterable $PM/PM_{10}/PM_{2.5}$ of 0.03 lb/hr and for condensable PM of 0.08 lb/hr.

Compliance will be demonstrated through natural gas usage records and certification of good combustion practices. Examples of good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

1.2.11.2 OVENS NO_X BACT

The ovens have the potential to emit NOx emissions.

Step 1 – Identify Potential Control Technologies

The principle pollutant generated by combustion of natural gas is nitric oxide (NO) and nitrogen dioxide (NO_2), collectively referred to as NO_x. NO_x emissions produced during combustion are primarily from the thermal NO_x formation mechanism. Thermal NO_x results from the high temperature oxidation of nitrogen (N_2) and oxygen (O_2). Thermal NO_x formation is influenced by the flue gas residence time, excess oxygen, and primarily by temperature, becoming significant at temperatures above 2,800 ºF. The concentration of "thermal NO_x" is controlled by the nitrogen and oxygen molar concentrations and the temperature of combustion. Combustion at temperatures well below 1,300 ºC (2,370 ºF) forms much smaller concentrations of thermal NO_x.

The following technologies are potentially available controls for NO_x emission from natural gas combustion sources.

TABLE 1-20 POTENTIAL CONTROL DEVICES FOR NO_X FROM OVENS

Control Type	Estimated NO_x Control Efficiency
SCR	70% -90%
NSCR	80% -90%
SNCR	40% -75%
Low-NO_x burners	40% -85%

The potential control devices to control NO_x emissions include the following:

- ***SCR***[81] - SCR units use a nitrogen-based reagent, such as ammonia (NH_3) or urea, to chemically reduce NO_x to molecular nitrogen and water vapor. The reagent is injected through a grid system into the flue gas stream, upstream of a catalyst bed. The waste gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst, where the reagent reacts selectively with NO_x within a specific temperature range.

  Operating temperatures between 480°F and 800°F are required of the gas stream at the catalyst bed, in order to carry out the catalytic reduction process. The greatest NO_x reduction occurs within a reaction window at catalyst bed temperatures between 600°F and 750°F for conventional catalysts and 470°F to 510°F for platinum based catalysts. The reaction of NH_3 and NO_x is favored by the presence of excess oxygen (greater than 1%). Depending on system design, NO_x removal rates of 70 to 90% are achievable under optimum conditions[82]. Technical factors related to this technology include the catalyst reactor design, optimum operating temperature, sulfur content of the charge, catalyst deactivation due to aging, ammonia slip emissions, and design of the ammonia injection system.

  Below the optimum temperature range, the catalyst activity is greatly reduced, potentially allowing unreacted ammonia (referred to as "ammonia slip") to be emitted directly to the atmosphere. SCR systems may also be subject to catalyst deactivation over time, due to physical deactivation and/or chemical poisoning. Catalyst suppliers typically guarantee a 3-year catalyst lifetime to achieve a specified emission limit.

  For an SCR system to effectively reduce NO_x emissions, the exhaust stream must have a relatively stable gas flow rate, NO_x concentration, and temperature profile.

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81 Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR), EPA-452/F-03-032, Washington, D.C.: Clean Air Technology Center, July 2003.

82 USEPA ACT Document - NO_x Emissions from Iron and Steel Mills, Sept. 1994.

- ***NSCR***[83] – NSCR is a post-combustion add-on exhaust gas treatment system for exhaust streams with a low O_2 content (between 1 to 2%). It is often referred to as a "three-way conversion" catalyst since it reduces NO_x, unburned hydrocarbons (UBH), and CO simultaneously. In order to operate properly, the combustion process must be stoichiometric or near-stoichiometric. Under stoichiometric conditions, in the presence of the catalyst, NO_x is reduced by CO, resulting in nitrogen and carbon dioxide. Operating temperatures between approximately 700°F and 1500°F are required of the gas stream in order to carry out the catalytic reduction process. Depending on the temperature and oxygen concentration of the exhaust, NO_x removal rates of 80 to 90% are achievable.
- ***SNCR***[84-] SNCR is a post-combustion technique that involves injecting ammonia or urea into specific temperature zones in the upper furnace or, in other cases, connective pass of a boiler or process heater to reduce both NO_x and CO emissions. A temperature of between 1,600°F and 2,100°F is required at the injection site for the process reaction to take place. The ammonia or urea reacts with NO_x in the gas to produce molecular nitrogen and water vapor. The NO_x reduction reaction is favored over other chemical reaction processes for a specific temperature range and in the presence of oxygen; therefore, it is considered a selective chemical process. SNCR is effective only in a stoichiometric or fuel-rich environment where combustion gas is nearly depleted of oxygen.
- ***Low NOx Burners –*** Low NOx burners are modified combustion burners, designed to minimize NOx formation through low excess air firing, controlled mixing of primary combustion air and fuel, or reducing peak furnace temperature.

Step 2 – Eliminate Technically Infeasible Options

SCR

SCR is a post-combustion technology that reduces NO_x emissions by reacting NO_x with ammonia in the presence of a catalyst. SCR technology has been most commonly applied to larger boilers and to natural gas-fired combustion turbines and requires ductwork. Ductwork cannot be built for the ovens due to the specific design requirements. Ducting is not feasible, and therefore, SCR is not technically feasible.

NSCR

NSCR requires precise adjustments of process conditions such as oxygen content and temperature, and works best with certain windows of inlet concentration for NO_x, CO, and VOC. These operating windows are necessary because the catalyst was developed to react the NO_x, CO, and VOC with one another, reducing the emissions of each of these pollutants. NSCR has typically been used to control emissions from internal combustion engines and nitric acid plants. It is effective only in stoichiometric or fuel-rich environments where combustion gas is nearly depleted of oxygen (approximately 0.5% excess oxygen or less). The typical oxygen content of the exhausts from ovens makes NSCR ineffective for these types of sources. Due to the oxygen content of the fuel, the lack of demonstrated applications for NSCR to industrial heaters and dryers, and operation outside of the optimal temperature range, this technology does not have the

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83 Draft CAM Technical Guidance Document: Nonselective Catalytic Reduction, EPA, April 2002. Available online at: https://www3.epa.gov/ttnchie1/mkb/documents/B_16a.pdf

84 Air Pollution Control Technology Fact Sheet: Selective Non-Catalytic Reduction (SNCR), EPA-452/F-03-031, Washington, D.C.: Clean Air Technology Center, July 2003.

practical potential for application that would make it an available or technically feasible control technology.

SNCR

SNCR is a post-combustion NO_x control technology where ammonia or urea is injected into the exhaust to react with NO_x to form nitrogen and water without the use of a catalyst. Use of these SNCR requires uniform mixing of the reagent and exhaust gas within a narrow temperature range. Operations outside of these operating conditions will significantly reduce removal efficiencies and may result in ammonia emissions, increased NO_x emissions. No examples were found where SNCR has been applied to a small natural gas burner. There is no appropriate temperature zone for SNCR application to the ovens. Therefore, SNCR is not technically feasible for these small burners.

For relatively small natural gas-fired sources, SCR, SNCR, and NSCR are technically infeasible and impractical due to the relatively small quantities of NO_X present in the exhaust gas.

Step 3 – Rank Remaining Technically Feasible Control Options

Low-NO_x Burners are the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

LNB

Low-NO_X burner (LNB) technology is the predominant control option identified in the RBLC for reducing NO_x emissions from commercial and institutional sized natural gas-fired burners for ovens. Low-NO_x burners and good combustion practices were recently selected as BACT for small natural gas-fired ovens.

It is important to note that these burners will operate higher temperatures than those of a typical boiler that uses a convection heat transfer mechanism. Low-NO_x burners are applicable, economical, and will be employed for the ovens. LNBs will be installed to meet 0.077 lb/MMBtu based on manufacturer specification.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for small heaters and burners reveal that the most stringent limits for NO_x are achieved by use of low NO_x burners and good combustion practices.

AMC will use low-NO_x burners with a numerical NO_x emission limit of a combined weighted average of 0.083 lb/MMBtu from each oven and RTO together assuming operation at full capacity. This limit is equivalent to 1.15 lb/hr NO_x.

1.2.11.3 OVENS VOC BACT

The ovens have the potential to emit VOC emissions.

Step 1 – Identify Potential Control Technologies

VOC emissions from combustion result from incomplete combustion caused when some of the fuel is not completely burned or is only partially burned. The following technologies are potentially available control technologies for VOC emission controls for natural gas combustion sources.

TABLE 1-21 POTENTIAL CONTROL DEVICES FOR VOC FROM OVENS

Control Type	Estimated VOC Control Efficiency
Recuperative thermal oxidizer	98% -99+%
Regenerative thermal oxidizer	95-99%
Catalytic oxidizer	90-99%
Clean fuel and good combustion practices	Base Case

The potentially applicable types of VOC controls are described in detail below:

- ***Recuperative or Regenerative Thermal Oxidation***[85, 86] **-** Recuperative and regenerative thermal oxidizers (RTOs) are two types of oxidizers that are widely applied to control VOCs. Both include some form of internal heat recovery, designed to reduce the operating cost of the system related to the consumption of a fuel source (typically natural gas) to raise the incoming gas temperature up to a combustion temperature within the burner zone as necessary to achieve the desired DRE. Heat recovery may either be recuperative or regenerative. In recuperative heat recovery, heat is recovered by passing the hot exhaust gases through a non-contact air-to-air heat exchanger, to heat the incoming air to the oxidizer. In regenerative heat recovery, hot exhaust gases and cool inlet gases are alternatively passed through a fixed bed, typically employing ceramics. RTOs have the ability to achieve a DRE of up to 99%, depending on the VOC inlet concentration.
- ***Catalytic Oxidation –*** Catalytic oxidizers use a bed of catalyst that facilitates the overall combustion of combustible gases. The catalyst increases the reaction rate and allows the conversion of CO and VOC to CO_2 at lower temperatures than a thermal oxidizer. The catalyst is typically a porous noble metal material that is supported in individual compartments within the unit. An auxiliary fuel-fired burner ahead of the bed heats the entering exhaust gases to 600°F to maintain proper bed temperature. Recuperative heat exchangers are used to recover the exiting exhaust gas heat and reduce the auxiliary fuel consumption. Exhaust gas temperatures that are too high may cause permanent damage to the catalyst, while operating temperatures that are too low may result in a lower VOC conversion efficiency. The typical VOC removal efficiency of a catalytic oxidation system is 90% or greater. The catalytic oxidation process for VOC control is very temperature sensitive.
- ***Clean Fuel and Good Combustion Practices*** - The use of natural gas as a combustion fuel, in preference over other fossil fuels such as oil or coal, results in fewer VOC emissions per unit of energy output. Natural gas also has benefits over other fossil fuels from the perspective of potentially generating other criteria pollutant emissions, such as SO_X. The use of good combustion practices can minimize the potential VOC emissions associated with incomplete

85 Air Pollution Control Technology Fact Sheet: Incinerator – Recuperative Type, EPA-452/F-03-020. Washington, D.C.: Clean Air Technology Center, July 2003.

86 Air Pollution Control Technology Fact Sheet: Regenerative Incinerator, EPA-452/F-03-021. Washington, D.C.: Clean Air Technology Center, July 2003.

combustion. Good combustion practices typically entail introducing the proper ratio of combustion air to the fuel, maintaining a minimum temperature in the firebox of the combustor, or a minimum residence time of fuel and air in the combustion zone. By employing good combustion practices, VOC emissions may be greatly reduced.

Step 2 – Eliminate Technically Infeasible Options

Catalytic Oxidation

Oxidation catalysts are used to reduce VOC emissions with typical VOC reductions of 50-90%. However, oxidation catalysts have limited demonstration in reducing VOC emissions from natural gas fired heaters, boilers, and furnaces.

Step 3 – Rank Remaining Technically Feasible Control Options

1. Recuperative or Regenerative Thermal Oxidation
2. Clean Fuel (Natural Gas) and Good Combustion Practices

Step 4 – Evaluate Remaining Control Technologies

Recuperative or Regenerative Thermal Oxidation

RTOs have the ability to achieve a DRE of up to 99%, depending on the VOC inlet concentration. With lower loading rates and solvent concentrations such as those expected for these ovens, a DRE of 98% can be achieved. Thermal oxidation of VOC emissions from ovens is a proven and widely used technology for removal of VOCs. Therefore, AMC proposes that BACT for VOC emissions be the use of an RTO, the use of natural gas (a clean-burning fuel with low VOC emissions), good combustion practices, and numerical emissions limits of 5.5 lb VOC/MMscf natural gas.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for ovens reveal that the most stringent limits for VOC are achieved by use of an RTO, clean fuel (natural gas) and good combustion practices. Emission factors for VOC from AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources, Section 1.4 - Natural Gas Combustion, are typically used to establish numerical limits.

AMC will utilize an RTO which will achieve either 99% VOC reduction or an outlet VOC concentration of 20 ppmv as carbon for scenarios which have lower than normal VOC loading to the RTO for curing oven emissions. AMC will also utilize clean fuel (natural gas) and good combustion practices. BACT will be a combined 0.30 lb/MMBtu from each oven and RTO. This limit is equivalent to 2.06 lb/hr VOC.

Compliance will be demonstrated through natural gas combustion records and certification of good combustion practices. Examples of good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

1.2.11.4 OVENS GHG BACT

CO_2e emissions from the proposed ovens will result from the combustion of natural gas as well as from the conversion of VOC emissions from coating usage to CO_2. In a properly tuned heater, a majority of the fuel carbon in natural gas is converted to CO_2 during the combustion process. Even burners operating with poor combustion efficiency produce minimal amounts of CH_4, CO, and VOC compared to CO_2 levels. Thus, the following control analysis focuses on CO_2 emissions.

Step 1 – Identify Potential Control Technologies

Potential control options are identified for CO_2 below. Because the primary GHG emitted by the proposed projects in this permit application is CO_2, the control technologies and measures presented in this section focus on CO_2 control technologies.

- ***Carbon Capture and Sequestration*** - Carbon capture and sequestration (CCS) is the long-term isolation of fossil fuel CO_2 emissions from the atmosphere through capturing and storing the CO_2 deep in the subsurface of the earth. CCS is the only potentially available add-on control option to reduce large-scale direct emissions from industrial processes.[87] CCS is made up of three key stages:
    1. <u>Capture:</u> Carbon capture is the separation of CO_2 from other gases produced when fossil fuels are combusted. Post-combustion CO_2 separation can be performed with chemical absorption systems using aqueous solution of amines as chemical solvents, or physical absorption systems using methanol or other solvents.
    2. <u>Transport:</u> After separation, CO_2 is compressed to facilitate transportation and storage if a locally available site for direct injection is unavailable. After compression, CO_2 is transported utilizing a third-party CO_2 pipeline system to transport CO_2 to distant geologic formations that may be more conducive to sequestration than sites in the immediate area. Building such a pipeline for dedicated use by a single facility will certainly make any project economically infeasible, from both an absolute and BACT-review perspective. However, such an option may be effective only if both adequate storage capacity exists downstream and reasonable transportation prices can be arranged with the pipeline operator.
    3. <u>Storage:</u> At a storage site, CO_2 is injected into deep underground rock formations, often at depths of one (1) km or more. Appropriate storage sites include depleted oil fields, depleted gas fields, rock formations that contain a high degree of salinity (saline formations). These potential sites must be evaluated to ensure they can store CO_2 safely and securely. At the site, the CO_2 is injected underground into solid, but porous rock such as sandstone, shale, dolomite, or basalt. These formations must be located under at least one layer of cap rock to prevent upward migration of the CO_2. Monitoring, reporting, and verification are important to demonstrate that CO_2 is safely stored.
- ***Energy Efficiency Measures***– Thermal efficiency is an emissions reduction strategy focused on increasing energy efficiency. Energy efficient process reduce the amount of fuel consumed. Reductions in fuel consumption result in reductions of direct emissions of GHGs at the steel mill, and reductions in electricity usage result in reductions of indirect GHG emissions. Many operating practices affect source energy efficiency including stirring method, addition of oxy-fuel burners, foamy slag, and variable speed drives.

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87 https://archive.epa.gov/epa/climatechange/carbon-dioxide-capture-and-sequestration-overview.html

Step 2 – Eliminate Technically Infeasible Options

Carbon Capture and Sequestration

Having a technically feasible carbon capture technology that is based on removing CO_2 in the gaseous form but that does not include viable long-term storage or a CO_2 transport system to move captured CO_2 to the storage site will not accomplish the goal of removing CO_2 from the atmosphere. Therefore, for CCS technology to be considered a technically feasible control option for consideration as BACT, carbon capture, carbon transport, and carbon storage must all be examined and deemed both available and technically feasible for the proposed source.

Carbon Capture

According to the Global CCS Institute[88], Abu Dhabi CCS is the world's first commercial CCS facility in the iron and steel industry at the Emirates Steel Industries factory in Mussafah with a capture capacity of 0.8 million metric tons per year of CO_2 from direct reduced iron (DRI). The DRI process produces a pure stream of CO_2 (greater than 98 percent), which was originally vented to the atmosphere. The project scope includes operation of a greenfield CO_2 Compression Facility (CCF) including dehydration, adjacent to the facility. CO_2 is transferred at low pressure to the CCF. At the CCF, CO_2 is dehydrated, compressed, metered, and exported to a CO_2 pipeline. CO_2 is then transported through an eight inch pipeline for EOR purposes. Although this project is associated with the Iron and Steel Production Industry, none of the proposed project emission sources at AMC have similar exhaust characteristics, nor will any of the exhaust streams consist of pure CO_2. The ovens will contain other products of combustion, making the exhaust stream not suitable for CCS; therefore, there is no specific evidence that there is a commercially available carbon capture system of the scale that would be required to control the CO_2 emissions for the proposed sources.

Carbon Storage

The small and large-scale CO_2 storage projects identified by National Energy Technology Laboratory,[89] have not yet reached the licensing and commercial stage of development. Indeed, these projects are being undertaken in public-private partnership arrangements, with significant financial support being provided by the Department of Energy. Moreover, the stated purpose of the large-scale projects is to "validate that CCS can be conducted at a commercial scale." In fact, the relatively small storage capacities of these projects (the largest of which is approximately 5 million metric tons) suggests that they are being conducted at a pilot scale. Technologies in the pilot scale testing stages of development are not considered "available" technologies. Because these pilot scale projects have not yet reached the licensing and commercial stage of development, permanent geological sequestration of CO_2 is not an available technology and has not been demonstrated for ovens.

Dedicated geological sequestration of CO_2 requires close proximity to a favorable geologic formation. Options for permanent sequestration of CO_2 in proximity of the proposed facility that

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88 Global CCS Institute, Canberra, Australia, May 2018. Project status available on-line at: http://www.globalccsinstitute.com/projects/abu-dhabi-ccs-project-phase-1-being-emirates-steel-industries-esi-ccs-project

89 National Energy Technology Laboratory National Carbon Sequestration Database and Interactive Viewer, available online at: https://www.netl.doe.gov/research/coal/carbon-storage/natcarb-atlas

could accommodate the amount of CO_2 generated from the proposed facility could not be found. Further, extensive characterization studies would be needed to determine the extent and storage potential for CO_2 in geological formations near the proposed facility. These studies would take several years of investigation, including drilling characterization wells, and would likely require small-scale injection testing before determining their full-scale viability.

Step 3 – Rank Remaining Technically Feasible Control Options

As CCS is considered to be technically infeasible, energy efficiency measures are the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

Energy Efficient Design

In a direct-fired burner, gas is fed directly to the burner, while an airstream provides the needed oxygen for combustion. Nearly 100% of the fuel is converted to heat, with an overall thermal efficiency around 92%. Therefore, fuel consumption and operating costs are reduced when compared to an indirect-fired unit. Furthermore, direct-fired heaters can be constructed to essentially any required size, and the facility does not have to opt for an oversized heater. Additionally, direct-fired heaters have a much higher turndown ratio than indirect-fired heaters, resulting in a greater ability to vary the heat output. RTOs are the most energy efficient VOC control device.

Step 5 – Selection of BACT

For CO_2e emissions generated from the ovens and RTOs, BACT is selected to be energy efficient design. No adverse energy, environmental, or economic impacts are associated with this control option. Compliance will be demonstrated through natural gas usage records. CO_2e from each of the ovens will be limited to 9,807 tpy for each oven and RTO, based on the default emission factors from 40 CFR Part 98 Subpart C, Tables C-1 and C-2 for natural gas as well as the conversion of VOC to CO_2 emissions from the coating usage.

1.2.12 BACT DETERMINATION FOR BOILERS

This section evaluates BACT for the new boilers being proposed by this project. Natural gas combustion in the units will result in emissions of PM/ PM_{10}/ $PM_{2.5}$, NO_x, VOC, and GHGs.

1.2.12.1 BOILERS PM/PM_{10}/$PM_{2.5}$ BACT

The boilers have the potential to emit PM/PM_{10}/$PM_{2.5}$ emissions.

Step 1 – Identify Potential Control Technologies

PM emissions from combustion are primarily the result of incomplete combustion, though PM emissions are also produced from the carryover of noncombustible trace constituents in the fuel (such as ash and metallic additives). Natural gas contains a very small amount of noncombustible trace constituents that result in PM/ PM_{10}/ $PM_{2.5}$ emissions. The following technologies are potentially available control technologies for PM/PM_{10}/$PM_{2.5}$ emission controls for natural gas-fired combustion sources.

TABLE 1-22 POTENTIAL CONTROL DEVICES FOR $PM/PM_{10}/PM_{2.5}$ FROM BOILERS

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ Control Efficiency
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
Wet scrubber or high efficiency venturi scrubber	70% to 99% (<0.01 gr/dscf)
ESP	>98%(0.004 – 0.01 gr/dscf)
Clean fuel and good combustion practices	Base Case

The potentially applicable types of particulate control systems are described in detail below.

- ***Fabric Filters***[90] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level. The design efficiency of dry filtration typically ranges between 0.001 to 0.01 gr/dscf.
- ***Wet Scrubbers***[91, 92] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.
- ***ESPs***[93, 94] - ESPs use an electrostatic field to charge particles contained in the gas stream. The charged particles migrate to a grounded collection surface where they are periodically dislodged by vibrating or rapping. The dust is collected in a hopper at the bottom of the ESP. With respect to $PM_{2.5}$ emissions, dry ESPs have a lower overall efficiency than baghouses. Dry ESPs are not designed to collect wet or sticky PM, such as condensable particles. Condensable

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90 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

91 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

92 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

93 Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-027, Washington, D.C.: Clean Air Technology Center, July 2003.

94 Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-029, Washington, D.C.: Clean Air Technology Center, July 2003.

matter will clog the ESP, stay attached to the plates, and possibly short out the unit. However, wet electrostatic precipitators (WESPs) can collect sticky particles and mists, as well as highly resistive or explosive dusts. The humid atmosphere that results from the continuous or intermittent washing in a wet ESP enables these units to collect high resistivity particles, absorb gases or cause pollutants to condense, and cool and condition the gas stream. Liquid particles or aerosols present in the gas stream are collected along with particles and provide another means of rinsing the collection electrodes.

- ***Clean Fuel and Good Combustion Practices*** - Fuels containing ash have the potential to produce particulate emissions. Additionally, fuels containing sulfur have the potential to produce sulfur compounds that may form condensable particulate emissions. Natural gas contains negligible amounts of particulate and is considered a low sulfur fuel. The use of good combustion practices can minimize the potential particulate emissions associated with incomplete combustion.

Step 2 – Eliminate Technically Infeasible Options

Baghouses

A baghouse is a post-combustion control technology that utilizes a fine mesh filter to remove particulate emissions primarily from large volume gas streams containing high particulate concentrations. No examples have been found where a baghouse has been applied to a small natural gas fired boiler due to the reduced volume and minimal particulate concentration of the associated exhaust gas stream. Therefore, baghouse technology is not technically feasible for the boilers.

Wet Scrubbing

No examples have been found where a scrubber has been applied to a similar natural gas-fired boiler due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. Wet scrubbers remove PM from a gas stream by capturing it in liquid droplets. Wet scrubbers are not well suited for use on extremely fine particles and are generally ineffective collection devices for submicron particles. The particulate emissions from the boilers will be a result of natural gas combustion and are less than 1 micrometer. Therefore, wet scrubber technology is not technically feasible for the boilers.

ESPs

Electrostatic precipitation is a post-combustion particulate emissions control most readily applied to large volume gas streams containing high particulate concentrations. No examples have been found where an ESP or WESP has been applied to a small natural gas fired boiler due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. Therefore, ESP is not technically feasible for the boilers.

Post-combustion controls, such as baghouses, scrubbers, and ESPs are technically infeasible due to the high pressure drops associated with these units and the low concentrations of $PM/PM_{10}/PM_{2.5}$ present in the exhaust gas.

Step 3 – Rank Remaining Technically Feasible Control Options

Clean Fuel (Natural Gas) and Good Combustion Practices are the only remaining technically feasible control options.

Step 4 – Evaluate Remaining Control Technologies

Clean Fuel and Good Combustion Practices

During the review of available control technologies for combustion sources at similar plants, no determinations were found for the use of add-on controls to reduce $PM/PM_{10}/PM_{2.5}$ emissions from small natural gas-fired boilers. Therefore, AMC considers BACT for these remaining small combustion sources to be the use of natural gas, a clean-burning fuel with low $PM/PM_{10}/PM_{2.5}$ emissions, and good combustion practices. Use of natural gas and good combustion practices are applicable, economical, and will be employed for the boilers. Good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for small boilers reveal that the most stringent limits for $PM/PM_{10}/PM_{2.5}$ are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for $PM/PM_{10}/PM_{2.5}$ from AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources, Section 1.4 - Natural Gas Combustion, are typically used to establish numerical limits. Generally, compliance with numerical $PM/PM_{10}/PM_{2.5}$ limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel.

AMC proposes to use clean fuel (natural gas) and good combustion practices, and a numerical limit of 1.9 pounds per million standard cubic feet (lb/MMscf) for PM (filterable) and 7.6 lb/MMscf $PM_{10}/PM_{2.5}$ as BACT for the boilers. These limits are equivalent to average hourly emissions for filterable $PM/PM_{10}/PM_{2.5}$ of 0.08 lb/hr and for condensable PM of 0.25 lb/hr.

Compliance will be demonstrated through natural gas usage records and certification of good combustion practices. Examples of good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

1.2.12.2 BOILERS NO_X BACT

The boilers have the potential to emit NOx emissions.

Step 1 – Identify Potential Control Technologies

The principle pollutant generated by combustion of natural gas is nitric oxide (NO) and nitrogen dioxide (NO_2), collectively referred to as NO_x. NO_x emissions produced during combustion are primarily from the thermal NO_x formation mechanism. Thermal NO_x results from the high temperature oxidation of nitrogen (N_2) and oxygen (O_2). Thermal NO_x formation is influenced by the flue gas residence time, excess oxygen, and primarily by temperature, becoming significant at temperatures above 2,800 ºF. The concentration of "thermal NO_x" is controlled by the nitrogen and oxygen molar concentrations and the temperature of combustion. Combustion at temperatures well below 1,300 ºC (2,370 ºF) forms much smaller concentrations of thermal NO_x.

The following technologies are potentially available controls for NO_x emission from natural gas combustion sources.

TABLE 1-23 POTENTIAL CONTROL DEVICES FOR NO_X FROM BOILERS

Control Type	Estimated NO_x Control Efficiency
SCR	70% -90%
NSCR	80% -90%
SNCR	40% -75%
Low-NO_x burners	40% -85%
Flue Gas Recirculation	30%-50%

The potential control devices to control NO_x emissions include the following:

- ***SCR***[95] - SCR units use a nitrogen-based reagent, such as ammonia (NH_3) or urea, to chemically reduce NO_x to molecular nitrogen and water vapor. The reagent is injected through a grid system into the flue gas stream, upstream of a catalyst bed. The waste gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst, where the reagent reacts selectively with NO_x within a specific temperature range.

  Operating temperatures between 480°F and 800°F are required of the gas stream at the catalyst bed, in order to carry out the catalytic reduction process. The greatest NO_x reduction occurs within a reaction window at catalyst bed temperatures between 600°F and 750°F for conventional catalysts and 470°F to 510°F for platinum based catalysts. The reaction of NH_3 and NO_x is favored by the presence of excess oxygen (greater than 1%). Depending on system design, NO_x removal rates of 70 to 90% are achievable under optimum conditions[96]. Technical factors related to this technology include the catalyst reactor design, optimum operating temperature, sulfur content of the charge, catalyst deactivation due to aging, ammonia slip emissions, and design of the ammonia injection system.

  Below the optimum temperature range, the catalyst activity is greatly reduced, potentially allowing unreacted ammonia (referred to as "ammonia slip") to be emitted directly to the atmosphere. SCR systems may also be subject to catalyst deactivation over time, due to physical deactivation and/or chemical poisoning. Catalyst suppliers typically guarantee a 3-year catalyst lifetime to achieve a specified emission limit.

  For an SCR system to effectively reduce NO_x emissions, the exhaust stream must have a relatively stable gas flow rate, NO_x concentration, and temperature profile.

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95 Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR), EPA-452/F-03-032, Washington, D.C.: Clean Air Technology Center, July 2003.

96 USEPA ACT Document - NO_x Emissions from Iron and Steel Mills, Sept. 1994.

- ***NSCR***[97] – NSCR is a post-combustion add-on exhaust gas treatment system for exhaust streams with a low O_2 content (between 1 to 2%). It is often referred to as a "three-way conversion" catalyst since it reduces NO_x, unburned hydrocarbons (UBH), and CO simultaneously. In order to operate properly, the combustion process must be stoichiometric or near-stoichiometric. Under stoichiometric conditions, in the presence of the catalyst, NO_x is reduced by CO, resulting in nitrogen and carbon dioxide. Operating temperatures between approximately 700°F and 1500°F are required of the gas stream in order to carry out the catalytic reduction process. Depending on the temperature and oxygen concentration of the exhaust, NO_x removal rates of 80 to 90% are achievable.
- ***SNCR***[98]- SNCR is a post-combustion technique that involves injecting ammonia or urea into specific temperature zones in the upper furnace or, in other cases, connective pass of a boiler or process heater to reduce both NO_x and CO emissions. A temperature of between 1,600°F and 2,100°F is required at the injection site for the process reaction to take place. The ammonia or urea reacts with NO_x in the gas to produce molecular nitrogen and water vapor. The NO_x reduction reaction is favored over other chemical reaction processes for a specific temperature range and in the presence of oxygen; therefore, it is considered a selective chemical process. SNCR is effective only in a stoichiometric or fuel-rich environment where combustion gas is nearly depleted of oxygen.
- ***Low NOx Burners –*** Low NOx burners are modified combustion burners, designed to minimize NOx formation through low excess air firing, controlled mixing of primary combustion air and fuel, or reducing peak furnace temperature.
- ***Flue Gas Recirculation (FGR) -*** During flue gas recirculation, a portion of the flue gas is returned to the combustion zone in order to decrease the peak flame temperature. When the flue gas mixes with the combustion air, the oxygen concentration is reduced, leaving less oxygen available for combustion and thus reducing the peak flame temperature. In addition, the recirculated flue gas absorbs some of the heat during combustion, further reducing the peak flame temperature. Flue gas recirculation can be done alone or in combination with low-NOx burners. NOx can be reduced from 30 to 50% with the use of flue gas recirculation. [99]

Step 2 – Eliminate Technically Infeasible Options

NSCR

NSCR requires precise adjustments of process conditions such as oxygen content and temperature, and works best with certain windows of inlet concentration for NO_x, CO, and VOC. These operating windows are necessary because the catalyst was developed to react the NO_x, CO, and VOC with one another, reducing the emissions of each of these pollutants. NSCR has typically been used to control emissions from internal combustion engines and nitric acid plants. It is effective only in stoichiometric or fuel-rich environments where combustion gas is nearly depleted of oxygen (approximately 0.5% excess oxygen or less). The typical oxygen content of the exhausts from boilers makes NSCR ineffective for these types of sources. Due to the oxygen content of the fuel, the lack of demonstrated applications for NSCR to industrial heaters and

97 Draft CAM Technical Guidance Document: Nonselective Catalytic Reduction, EPA, April 2002. Available online at: https://www3.epa.gov/ttnchie1/mkb/documents/B_16a.pdf

98 Air Pollution Control Technology Fact Sheet: Selective Non-Catalytic Reduction (SNCR), EPA-452/F-03-031, Washington, D.C.: Clean Air Technology Center, July 2003.

99 Guide to Low-Emission Boiler and Combustion Equipment Selection. Oak Ridge National Laboratory. April 2002. https://www.energy.gov/sites/prod/files/2014/05/f15/guide_low_emission.pdf

dryers, and operation outside of the optimal temperature range, this technology does not have the practical potential for application that would make it an available or technically feasible control technology.

SNCR

SNCR is a post-combustion NO_x control technology where ammonia or urea is injected into the exhaust to react with NO_x to form nitrogen and water without the use of a catalyst. Use of these SNCR requires uniform mixing of the reagent and exhaust gas within a narrow temperature range. Operations outside of these operating conditions will significantly reduce removal efficiencies and may result in ammonia emissions, increased NO_x emissions. No examples were found where SNCR has been applied to a small natural gas burner. There is no appropriate temperature zone for SNCR application to the boilers. Therefore, SNCR is not technically feasible for these small boilers.

For relatively small natural gas-fired sources, SCR, SNCR, and NSCR are technically infeasible and impractical due to the relatively small quantities of NO_X present in the exhaust gas.

Step 3 – Rank Remaining Technically Feasible Control Options

1. SCR, 70% - 90%
2. Low-NOx burners, 40% - 85%
3. FGR, 30% - 50%

Step 4 – Evaluate Remaining Control Technologies

SCR

As can be seen in the RBLC tables, SCR is rarely used for small gas-fired boilers and is not typically used for boilers similarly sized to the proposed 45.5 MMBtu/hr boiler. According to the USEPA's control technology guidance document, SCR technology can achieve >70% reduction efficiencies for NO_x concentrations as low as 20 ppm.[100] The proposed auxiliary boiler will be equipped with low NO_x burners, resulting in a NOx concentration less than 10 ppm.

LNB

Low-NO_X burner (LNB) technology is the predominant control option identified in the RBLC for reducing NO_x emissions from commercial and institutional sized natural gas-fired boilers. Low-NO_x burners and good combustion practices were recently selected as BACT for small natural gas-fired boilers. Historically, FGR is not part of the BACT for these types of units, as reflected in the RBLC.

It is important to note that these burners will operate higher temperatures than those of a typical boiler that uses a convection heat transfer mechanism. Low-NO_x burners are applicable, economical, and will be employed for the boilers. LNBs will be installed to meet 0.036 lb/MMBtu based on manufacturer specification.

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[100] USEPA Air Pollution Control Technology Fact Sheet. Selective Catalytic Reduction (SCR). https://www3.epa.gov/ttncatc1/dir1/fscr.pdf

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for small heaters and burners reveal that the most stringent limits for NO_x are achieved by use of low NO_x burners and good combustion practices. Emission limits range from approximately 0.004 lb/MMBtu to 0.01 lb/MMBtu (36 ppmv to 100 ppmv). Because these units are direct fired, a low-NO_x emission rate is 0.036 lb/MMBtu. Indirect fired units are capable of lower NO_x limits, but are not as efficient or applicable. Generally, compliance with numerical NO_x limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel, and vendor guarantees.

AMC will use low-NO_x burners with a numerical NO_x emission limit of 0.036 lb/MMBtu from the boilers. This limit is equivalent to 1.64 lb/hr NO_x.

1.2.12.3 BOILERS VOC BACT

The boilers have the potential to emit VOC emissions.

Step 1 – Identify Potential Control Technologies

VOC emissions from combustion result from incomplete combustion caused when some of the fuel is not completely burned or is only partially burned. The following technologies are potentially available control technologies for VOC emission controls for natural gas combustion sources.

TABLE 1-24 POTENTIAL CONTROL DEVICES FOR VOC FROM BOILERS

Control Type	Estimated VOC Control Efficiency
Thermal oxidizer (afterburner)	98% -99+%
Recuperative thermal oxidizer	98% -99+%
Regenerative thermal oxidizer	95-99%
Catalytic oxidizer	90-99%
Clean fuel and good combustion practices	Base Case

The potentially applicable types of VOC controls are described in detail below:

- ***Thermal Oxidation***[101] - A thermal oxidizer is a large vessel with a burner where fuel, gaseous waste, and air are introduced and combined to achieve the required destruction removal efficiency (DRE). The mixture must be exposed to a sufficiently high temperature for an adequate time period in a relatively turbulent environment to enable the chemical reactions to reach the degree of completion needed to achieve the DRE.

101 Air Pollution Control Technology Fact Sheet: Thermal Incinerator, EPA-452/F-03-022, Washington, D.C.: Clean Air Technology Center, July 2003.

- ***Recuperative or Regenerative Thermal Oxidation***[102,103] **-** Recuperative and regenerative thermal oxidizers (RTOs) are two types of oxidizers that are widely applied to control VOCs. Both include some form of internal heat recovery, designed to reduce the operating cost of the system related to the consumption of a fuel source (typically natural gas) to raise the incoming gas temperature up to a combustion temperature within the burner zone as necessary to achieve the desired DRE. Heat recovery may either be recuperative or regenerative. In recuperative heat recovery, heat is recovered by passing the hot exhaust gases through a non-contact air-to-air heat exchanger, to heat the incoming air to the oxidizer. In regenerative heat recovery, hot exhaust gases and cool inlet gases are alternatively passed through a fixed bed, typically employing ceramics. RTOs have the ability to achieve a DRE of up to 99%, depending on the VOC inlet concentration.
- ***Catalytic Oxidation –*** Catalytic oxidizers use a bed of catalyst that facilitates the overall combustion of combustible gases. The catalyst increases the reaction rate and allows the conversion of CO and VOC to CO_2 at lower temperatures than a thermal oxidizer. The catalyst is typically a porous noble metal material that is supported in individual compartments within the unit. An auxiliary fuel-fired burner ahead of the bed heats the entering exhaust gases to 600°F to maintain proper bed temperature. Recuperative heat exchangers are used to recover the exiting exhaust gas heat and reduce the auxiliary fuel consumption. Exhaust gas temperatures that are too high may cause permanent damage to the catalyst, while operating temperatures that are too low may result in a lower VOC conversion efficiency. The typical VOC removal efficiency of a catalytic oxidation system is 90% or greater. The catalytic oxidation process for VOC control is very temperature sensitive.
- ***Clean Fuel and Good Combustion Practices*** - The use of natural gas as a combustion fuel, in preference over other fossil fuels such as oil or coal, results in fewer VOC emissions per unit of energy output. Natural gas also has benefits over other fossil fuels from the perspective of potentially generating other criteria pollutant emissions, such as SO_X. The use of good combustion practices can minimize the potential VOC emissions associated with incomplete combustion. Good combustion practices typically entail introducing the proper ratio of combustion air to the fuel, maintaining a minimum temperature in the firebox of the combustor, or a minimum residence time of fuel and air in the combustion zone. By employing good combustion practices, VOC emissions may be greatly reduced.

Step 2 – Eliminate Technically Infeasible Options

Thermal Oxidizer (Afterburner), Recuperative Thermal Oxidizer, and Regenerative Thermal Oxidizer

Thermal oxidation, recuperative thermal oxidation, and regenerative thermal oxidation is technically infeasible because it would involve more combustion following already highly efficient combustion. Further, thermal oxidation would increase combustion emissions and require additional fuel use (wasted energy). The VOC emissions from the boilers are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for the boilers.

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102 Air Pollution Control Technology Fact Sheet: Incinerator – Recuperative Type, EPA-452/F-03-020. Washington, D.C.: Clean Air Technology Center, July 2003.

103 Air Pollution Control Technology Fact Sheet: Regenerative Incinerator, EPA-452/F-03-021. Washington, D.C.: Clean Air Technology Center, July 2003.

Catalytic Oxidizer

Catalytic oxidation is a post-combustion control technology that utilizes a catalyst to oxidize VOC into CO_2 or water (H_2O). The technology has most commonly been applied to natural gas fired combustion turbines. No examples were identified where add-on control technology has been applied to small natural gas-fired burners. The VOC emissions from the boilers are below the outlet concentration typically guaranteed for this control device. Because of the low quantities of VOC emissions, the use of catalytic oxidation technology is determined to be not feasible.

For relatively small natural gas-fired sources, post-combustion controls, such as thermal oxidizers, recuperative incinerators, regenerative incinerators, and catalytic oxidizers are technically infeasible and impractical due to the relatively small quantities of VOC present in the exhaust gas.

Step 3 – Rank Remaining Technically Feasible Control Options

1. Clean Fuel (Natural Gas) and Good Combustion Practices

Step 4 – Evaluate Remaining Control Technologies

Clean Fuel and Good Combustion Practices

Add-on controls, even if feasible, are not typically required for small combustion sources fired with natural gas. During the review of available control technologies for combustion sources at similar facilities, no determinations were found for the use of add-on controls to reduce VOC emissions from small natural gas-fired equipment. Therefore, AMC proposes that BACT for VOC emissions from combustion sources be limited to the use of natural gas (a clean-burning fuel with low VOC emissions), good combustion practices, and numerical emissions limits of 5.5 lb VOC/MMscf natural gas.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of BACT emission limits for small heaters and burners reveal that the most stringent limits for VOC are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for VOC from AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources, Section 1.4 - Natural Gas Combustion, are typically used to establish numerical limits. Generally, compliance with numerical VOC limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel and certification of good combustion practices.

AMC will utilize clean fuel (natural gas) and good combustion practices, and numerical emissions limits of 5.5 lb VOC/MMscf natural gas as BACT for VOC emissions from the boilers. This limit is equivalent to 0.25 lb/hr VOC.

Compliance will be demonstrated through natural gas combustion records and certification of good combustion practices. Examples of good combustion practices include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance, conducting burner and control adjustments, monitoring fuel quality, etc.

1.2.12.4 BOILERS GHG BACT

CO_2e emissions from the proposed boilers will result from the combustion of natural gas. In a properly tuned heater, a majority of the fuel carbon in natural gas is converted to CO_2 during the combustion process. Even burners operating with poor combustion efficiency produce minimal amounts of CH_4, CO, and VOC compared to CO_2 levels. Thus, the following control analysis focuses on CO_2 emissions.

Step 1 – Identify Potential Control Technologies

Potential control options are identified for CO_2 below. Because the primary GHG emitted by the proposed projects in this permit application is CO_2, the control technologies and measures presented in this section focus on CO_2 control technologies.

- ***Carbon Capture and Sequestration*** - Carbon capture and sequestration (CCS) is the long-term isolation of fossil fuel CO_2 emissions from the atmosphere through capturing and storing the CO_2 deep in the subsurface of the earth. CCS is the only potentially available add-on control option to reduce large-scale direct emissions from industrial processes.[104] CCS is made up of three key stages:
    1. <u>Capture:</u> Carbon capture is the separation of CO_2 from other gases produced when fossil fuels are combusted. Post-combustion CO_2 separation can be performed with chemical absorption systems using aqueous solution of amines as chemical solvents, or physical absorption systems using methanol or other solvents.
    2. <u>Transport:</u> After separation, CO_2 is compressed to facilitate transportation and storage if a locally available site for direct injection is unavailable. After compression, CO_2 is transported utilizing a third-party CO_2 pipeline system to transport CO_2 to distant geologic formations that may be more conducive to sequestration than sites in the immediate area. Building such a pipeline for dedicated use by a single facility will certainly make any project economically infeasible, from both an absolute and BACT-review perspective. However, such an option may be effective only if both adequate storage capacity exists downstream and reasonable transportation prices can be arranged with the pipeline operator.
    3. <u>Storage:</u> At a storage site, CO_2 is injected into deep underground rock formations, often at depths of one (1) km or more. Appropriate storage sites include depleted oil fields, depleted gas fields, rock formations that contain a high degree of salinity (saline formations). These potential sites must be evaluated to ensure they can store CO_2 safely and securely. At the site, the CO_2 is injected underground into solid, but porous rock such as sandstone, shale, dolomite, or basalt. These formations must be located under at least one layer of cap rock to prevent upward migration of the CO_2. Monitoring, reporting, and verification are important to demonstrate that CO_2 is safely stored.
- ***Energy Efficiency Measures***– Thermal efficiency is an emissions reduction strategy focused on increasing energy efficiency. Energy efficient process reduce the amount of fuel consumed. Reductions in fuel consumption result in reductions of direct emissions of GHGs at the steel mill, and reductions in electricity usage result in reductions of indirect GHG emissions. Many operating practices affect source energy efficiency including stirring method, addition of oxy-fuel burners, foamy slag, and variable speed drives.

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[104] https://archive.epa.gov/epa/climatechange/carbon-dioxide-capture-and-sequestration-overview.html

Step 2 – Eliminate Technically Infeasible Options

Carbon Capture and Sequestration

Having a technically feasible carbon capture technology that is based on removing CO_2 in the gaseous form but that does not include viable long-term storage or a CO_2 transport system to move captured CO_2 to the storage site will not accomplish the goal of removing CO_2 from the atmosphere. Therefore, for CCS technology to be considered a technically feasible control option for consideration as BACT, carbon capture, carbon transport, and carbon storage must all be examined and deemed both available and technically feasible for the proposed sources.

Carbon Capture

According to the Global CCS Institute[105], Abu Dhabi CCS is the world's first commercial CCS facility in the iron and steel industry at the Emirates Steel Industries factory in Mussafah with a capture capacity of 0.8 million metric tons per year of CO_2 from direct reduced iron (DRI). The DRI process produces a pure stream of CO_2 (greater than 98 percent), which was originally vented to the atmosphere. The project scope includes operation of a greenfield CO_2 Compression Facility (CCF) including dehydration, adjacent to the facility. CO_2 is transferred at low pressure to the CCF. At the CCF, CO_2 is dehydrated, compressed, metered, and exported to a CO_2 pipeline. CO_2 is then transported through an eight inch pipeline for EOR purposes. Although this project is associated with the Iron and Steel Production Industry, none of the proposed project emission sources at AMC have similar exhaust characteristics, nor will any of the exhaust streams consist of pure CO_2. The boilers will contain other products of combustion, making the exhaust stream not suitable for CCS; therefore, there is no specific evidence that there is a commercially available carbon capture system of the scale that would be required to control the CO_2 emissions for the proposed boilers.

Carbon Storage

The small and large-scale CO_2 storage projects identified by National Energy Technology Laboratory,[106] have not yet reached the licensing and commercial stage of development. Indeed, these projects are being undertaken in public-private partnership arrangements, with significant financial support being provided by the Department of Energy. Moreover, the stated purpose of the large-scale projects is to "validate that CCS can be conducted at a commercial scale." In fact, the relatively small storage capacities of these projects (the largest of which is approximately 5 million metric tons) suggests that they are being conducted at a pilot scale. Technologies in the pilot scale testing stages of development are not considered "available" technologies. Because these pilot scale projects have not yet reached the licensing and commercial stage of development, permanent geological sequestration of CO_2 is not an available technology and has not been demonstrated for boilers.

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[105] Global CCS Institute, Canberra, Australia, May 2018. Project status available on-line at: http://www.globalccsinstitute.com/projects/abu-dhabi-ccs-project-phase-1-being-emirates-steel-industries-esi-ccs-project

[106] National Energy Technology Laboratory National Carbon Sequestration Database and Interactive Viewer, available online at: https://www.netl.doe.gov/research/coal/carbon-storage/natcarb-atlas

Dedicated geological sequestration of CO_2 requires close proximity to a favorable geologic formation. Options for permanent sequestration of CO_2 in proximity of the proposed facility that could accommodate the amount of CO_2 generated from the proposed facility could not be found. Further, extensive characterization studies would be needed to determine the extent and storage potential for CO_2 in geological formations near the proposed facility. These studies would take several years of investigation, including drilling characterization wells, and would likely require small-scale injection testing before determining their full-scale viability.

Step 3 – Rank Remaining Technically Feasible Control Options

As CCS is considered to be technically infeasible, energy efficiency measures are the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

Energy Efficient Design

In a direct-fired burner, gas is fed directly to the burner, while an airstream provides the needed oxygen for combustion. Nearly 100% of the fuel is converted to heat, with an overall thermal efficiency around 92%. Therefore, fuel consumption and operating costs are reduced when compared to an indirect-fired unit. Furthermore, direct-fired heaters can be constructed to essentially any required size, and the facility does not have to opt for an oversized heater. Additionally, direct-fired heaters have a much higher turndown ratio than indirect-fired heaters, resulting in a greater ability to vary the heat output.

Step 5 – Selection of BACT

For CO_2e emissions generated from the boilers, BACT is selected to be energy efficient design. No adverse energy, environmental, or economic impacts are associated with this control option. Compliance will be demonstrated through natural gas usage records. CO_2e from the boilers will be limited to 5,327.963 lb/hr and 48,23,336.478 tpy, based on the default emission factors from 40 CFR Part 98 Subpart C, Tables C-1 and C-2 for natural gas.

1.2.13 BACT DETERMINATION FOR ACL COOLING SECTION

Following the coating process and curing oven, the coated strip is cooled with air, and then passes into the exit section with inspection and measurement of strip quality before being rewound into coils. During the cooling process there is the potential for VOC and PM emissions.

1.2.13.1 ACL COOLING PM/PM_{10}/$PM_{2.5}$ BACT

The ACL Coolers have the potential to emit PM/PM_{10}/$PM_{2.5}$ emissions.

Step 1 – Identify Potential Control Technologies

The following technologies are potentially available control technologies for PM/PM_{10}/$PM_{2.5}$ emission controls for ACL Cooling.+

TABLE 1-25 POTENTIAL CONTROL DEVICES FOR $PM/PM_{10}/PM_{2.5}$ FROM ACL COOLING

Control Type	Estimated PM/PM10/$PM_{2.5}$ Control Efficiency
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
Wet scrubber or high efficiency venturi scrubber	70% to 99% (<0.01 gr/dscf)
ESP	>98%(0.004 – 0.01 gr/dscf)
Proper Operation and Maintenance	Base Case

The potentially applicable types of particulate control systems are described in detail below.

- ***Fabric Filters***[107] - This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of reusable filter bags. Initially, dust is deposited on the surface and on the fibers within the fabric filter. Dust becomes the dominant filter medium as the dust cake layer builds on the filter. The resistance to gas flow and pressure drop increase as the thickness of the dust cake layer increases until the gas can no longer easily pass through for filtration. Reusable filters can be cleaned by mechanically shaking, reversing the air flow, or pulsing the bags (i.e., fabric filter baghouses); filter bags must be replaced when they become loaded with PM to the point that the pressure drop across the filter bags reaches a specified level. The design efficiency of dry filtration typically ranges between 0.001 to 0.01 gr/dscf.
- ***Wet Scrubbers***[108, 109] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.
- ***ESPs***[110, 111] - ESPs use an electrostatic field to charge particles contained in the gas stream. The charged particles migrate to a grounded collection surface where they are periodically dislodged by vibrating or rapping. The dust is collected in a hopper at the bottom of the ESP. With respect to $PM_{2.5}$ emissions, dry ESPs have a lower overall efficiency than baghouses. Dry

107 Air Pollution Control Technology Fact Sheet: Fabric Filter Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, July 2003.

108 Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

109 Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

110 Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-027, Washington, D.C.: Clean Air Technology Center, July 2003.

111 Air Pollution Control Technology Fact Sheet: Wet Electrostatic Precipitator (ESP) Wire –Pipe Type, EPA-452/F-03-029, Washington, D.C.: Clean Air Technology Center, July 2003.

ESPs are not designed to collect wet or sticky PM, such as condensable particles. Condensable matter will clog the ESP, stay attached to the plates, and possibly short out the unit. However, wet electrostatic precipitators (WESPs) can collect sticky particles and mists, as well as highly resistive or explosive dusts. The humid atmosphere that results from the continuous or intermittent washing in a wet ESP enables these units to collect high resistivity particles, absorb gases or cause pollutants to condense, and cool and condition the gas stream. Liquid particles or aerosols present in the gas stream are collected along with particles and provide another means of rinsing the collection electrodes.

- ***Proper Operation and Maintenance*** - Proper operation, design and preventative maintenance procedures including regular inspections, maintaining operating logs, and recordkeeping can lead to reducing emissions.

Step 2 – Eliminate Technically Infeasible Options

Baghouses

A baghouse is a post-combustion control technology that utilizes a fine mesh filter to remove particulate emissions primarily from large volume gas streams containing high particulate concentrations. No examples have been found where a baghouse has been applied to an ACL Cooling due to the reduced volume and minimal particulate concentration of the associated exhaust gas stream. The PM emissions from the ACL Cooling are below the outlet concentration typically guaranteed for this control device. Therefore, baghouse technology is not technically feasible for ACL Cooling.

Wet Scrubbing

No examples have been found where a scrubber has been applied to a similar source due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. Wet scrubbers remove PM from a gas stream by capturing it in liquid droplets. Wet scrubbers are not well suited for use on extremely fine particles and are generally ineffective collection devices for submicron particles. The particulate emissions from ACL Cooling will be a result of natural gas combustion and are less than 1 micrometer. The PM emissions from ACL Cooling are below the outlet concentration typically guaranteed for this control device. Therefore, wet scrubber technology is not technically feasible for the source.

ESPs

Electrostatic precipitation is a post-combustion particulate emissions control most readily applied to large volume gas streams containing high particulate concentrations. No examples have been found where an ESP or WESP has been applied to ACL Cooling due to the reduced volume and minimal particulate concentrations of the associated exhaust gas stream. The PM emissions from ACL Cooling are below the outlet concentration typically guaranteed for this control device. Therefore, ESP is not technically feasible for the source.

Post-combustion controls, such as baghouses, scrubbers, and ESPs are technically infeasible due to the high pressure drops associated with these units and the low concentrations of $PM/PM_{10}/PM_{2.5}$ present in the exhaust gas.

Step 3 – Rank Remaining Technically Feasible Control Options

Proper Operation and Maintenance are the only remaining technically feasible control options.

Step 4 – Evaluate Remaining Control Technologies

No RBLC entries for this operation were found.

Therefore, AMC considers BACT for this source to be the use of proper operation and maintenance including regular inspections, maintaining operating logs, and recordkeeping.

Step 5 – Selection of BACT

BACT Limit Overview

AMC proposes proper operation and maintenance as BACT. These limits are equivalent to average hourly emissions for filterable PM/PM_{10}/$PM_{2.5}$ of 0.37 lb/hr.

Examples of proper operation and maintenance include activities such as maintaining operating logs and recordkeeping, conducting training, ensuring maintenance knowledge, performing routine and preventive maintenance.

1.2.13.2 ACL COOLING VOC BACT

The ACL Coolers have the potential to emit VOC emissions.

Step 1 – Identify Potential Control Technologies

The following technologies are potentially available control technologies for VOC emission controls for this type of source.

TABLE 1-26 POTENTIAL CONTROL DEVICES FOR VOC FROM ACL COOLING

Control Type	Estimated VOC Control Efficiency
Thermal oxidizer (afterburner)	98% -99+%
Recuperative thermal oxidizer	98% -99+%
Regenerative thermal oxidizer	95-99%
Catalytic oxidizer	90-99%
Proper equipment design and operation	Base Case

The potentially applicable types of VOC controls are described in detail below:

- ***Thermal Oxidation***[112] - A thermal oxidizer is a large vessel with a burner where fuel, gaseous waste, and air are introduced and combined to achieve the required destruction removal efficiency (DRE). The mixture must be exposed to a sufficiently high temperature for an adequate time period in a relatively turbulent environment to enable the chemical reactions to reach the degree of completion needed to achieve the DRE.

[112] Air Pollution Control Technology Fact Sheet: Thermal Incinerator, EPA-452/F-03-022, Washington, D.C.: Clean Air Technology Center, July 2003.

- ***Recuperative or Regenerative Thermal Oxidation***[113,114] **-** Recuperative and regenerative thermal oxidizers (RTOs) are two types of oxidizers that are widely applied to control VOCs. Both include some form of internal heat recovery, designed to reduce the operating cost of the system related to the consumption of a fuel source (typically natural gas) to raise the incoming gas temperature up to a combustion temperature within the burner zone as necessary to achieve the desired DRE. Heat recovery may either be recuperative or regenerative. In recuperative heat recovery, heat is recovered by passing the hot exhaust gases through a non-contact air-to-air heat exchanger, to heat the incoming air to the oxidizer. In regenerative heat recovery, hot exhaust gases and cool inlet gases are alternatively passed through a fixed bed, typically employing ceramics. RTOs have the ability to achieve a DRE of up to 99%, depending on the VOC inlet concentration.
- ***Catalytic Oxidation –*** Catalytic oxidizers use a bed of catalyst that facilitates the overall combustion of combustible gases. The catalyst increases the reaction rate and allows the conversion of CO and VOC to CO_2 at lower temperatures than a thermal oxidizer. The catalyst is typically a porous noble metal material that is supported in individual compartments within the unit. An auxiliary fuel-fired burner ahead of the bed heats the entering exhaust gases to 600°F to maintain proper bed temperature. Recuperative heat exchangers are used to recover the exiting exhaust gas heat and reduce the auxiliary fuel consumption. Exhaust gas temperatures that are too high may cause permanent damage to the catalyst, while operating temperatures that are too low may result in a lower VOC conversion efficiency. The typical VOC removal efficiency of a catalytic oxidation system is 90% or greater. The catalytic oxidation process for VOC control is very temperature sensitive.
- ***Proper Equipment Design and Operation –*** Higher VOC emissions result from poor equipment design, firing conditions, or compromised seals. Through proper equipment maintenance, inspections, and operation, the formation of VOC can be controlled at an acceptable level.

Step 2 – Eliminate Technically Infeasible Options

Thermal Oxidizer (Afterburner), Recuperative Thermal Oxidizer, and Regenerative Thermal Oxidizer

Thermal oxidation, recuperative thermal oxidation, and regenerative thermal oxidation are technically infeasible because it would involve more combustion following already highly efficient combustion. Further, thermal oxidation would increase combustion emissions and require additional fuel use (wasted energy). The VOC emissions from ACL Cooling are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for this source.

Catalytic Oxidizer

Catalytic oxidation is a post-combustion control technology that utilizes a catalyst to oxidize VOC into CO_2 or water (H_2O). The technology has most commonly been applied to natural gas fired combustion turbines. No examples were identified where add-on control technology has been

113 Air Pollution Control Technology Fact Sheet: Incinerator – Recuperative Type, EPA-452/F-03-020. Washington, D.C.: Clean Air Technology Center, July 2003.

114 Air Pollution Control Technology Fact Sheet: Regenerative Incinerator, EPA-452/F-03-021. Washington, D.C.: Clean Air Technology Center, July 2003.

applied to cooling sections such as this source. Because of the low quantities of VOC emissions, the use of catalytic oxidation technology is determined to be not feasible.

For relatively small natural gas-fired sources, post-combustion controls, such as thermal oxidizers, recuperative incinerators, regenerative incinerators, and catalytic oxidizers are technically infeasible and impractical due to the relatively small quantities of VOC present in the exhaust gas. The VOC emissions from ACL Cooling are below the outlet concentration typically guaranteed for this control device. Therefore, this technology is not technically feasible for this source.

Step 3 – Rank Remaining Technically Feasible Control Options

Proper equipment design and operation is the only remaining control.

Step 4 – Evaluate Remaining Control Technologies

No RBLC entries for this operation were found.

As such, AMC proposes BACT to be proper equipment design and operation, with a numerical VOC emissions limit of 6.6 mg/Nm^3.

Step 5 – Selection of BACT

AMC will utilize proper equipment design and operation with a numerical emissions limit of 6.6 mg/Nm^{3}as BACT for VOC emissions from this source. This limit is equivalent to 2.4 lb/hr VOC.

1.2.14 BACT DETERMINATION FOR QUENCHING

This section evaluates BACT for the new quenching being proposed by this project.

1.2.14.1 QUENCHING PM/PM_{10}/$PM_{2.5}$ BACT

The quenching process has the potential to emit PM/PM_{10}/$PM_{2.5}$ emissions.

Step 1 – Identify Potential Control Technologies

Based on information obtained from USEPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential PM/PM_{10}/$PM_{2.5}$ controls for the quenching process was developed.

TABLE 1-27 POTENTIAL CONTROL DEVICES FOR PM_{10}/$PM_{2.5}$ FROM QUENCHING

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency
High efficiency cyclone	80-99% for PM, 30-90% for PM10, 0-40% for PM2.5 (>0.01 gr/dscf)
Wet scrubber or high efficiency Venturi scrubber	70-99% (~0.01 gr/dscf)
Mist eliminator	70-99%

Each of the potentially applicable controls is described below.

- ***High Efficiency Cyclones***[115] – This type of particulate control technology (such as a cyclone) is typically utilized to remove large particles (greater than 8 to 10 microns [µm] in aerodynamic diameter) through centrifugal and inertial forces induced by mechanically accelerating the particle-laden gas stream. This type of control is not effective in removing small particles – achieving approximately 30% control efficiency for PM_{10}.
- ***Wet Scrubbers***[116, 117] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$. Wet scrubbers are efficient for removing fine and sub micrometer particles. High efficiency Venturi scrubbers use a downdraft of air to push the particulates into contact with water droplets. The collection efficiency of a Venturi scrubber is highly dependent on pressure drop, the liquid-to-gas ratio, and chemical nature of wettability of the particulate. Efficiency improves with increased liquid-to-gas ratios, but at the expense of higher pressure drop and energy consumption. Venturi scrubbers must be followed by an entrainment collector for the liquid spray. The collectors are typically centrifugal and will have an additional pressure drop. Water scrubber systems can be less effective for controlling PM/PM_{10} emissions than baghouses. These types of wet scrubbers are capable of achieving control efficiencies of up to 99%. The second most common particulate control technology is wet scrubbing, and a reasonable outlet loading for a high efficiency Venturi scrubber system is in the range of 0.005 gr/dscf to 0.01 gr/dscf.
- ***Mist Eliminators***[118] **-** Fiber-bed scrubbers or mist eliminators are capable of control efficiencies ranging from 70% to 99%, depending on exhaust stream characteristics and size of aerosols. Insoluble PM will clog the fiber-bed filter over time; therefore, fiber-bed filters have a limited commercial acceptance for dust collection. Fiber-bed scrubbers can treat exhaust streams with flow rates ranging from 1,000 scfm to 100,000 scfm and temperatures up to 140°F. For mist eliminators to be considered effective at reducing $PM/PM_{10}/PM_{2.5}$ emissions, the inlet loading must be at least 0.1 gr/dscf.

Step 2 – Eliminate Technically Infeasible Control Technologies

High Efficiency Cyclone

In addition to the fact that high efficiency cyclones are typically used to remove larger particles, no BACT determinations for quenching were found that include the use of high efficiency cyclones or mechanical collectors, so this type of control is considered technically infeasible for removing fine PM emissions. Mechanical collectors are used primarily for pretreatment control devices and are not considered a "best" available control technology; for these reasons, this control technology is eliminated from further consideration.

Step 3 – Ranking Remaining Control Technologies by Control Effectiveness

1. Mist eliminators
2. Wet Scrubber, 70% – 99% (~ 0.01 gr/dscf)

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[115] Air Pollution Control Technology Fact Sheet: Cyclones, EPA- 452/F-03-005, Washington, D.C.: Clean Air Technology Center, July 2003.

[116] Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, July 2003

[117] Air Pollution Control Technology Fact Sheet: Spray-Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, July 2003.

[118] Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

Step 4 – Evaluate the Most Effective Controls and Document Results

Mist eliminators remove between 70% and 99% of the liquid droplets from the waste gas stream. There are two basic designs, chevron, and mesh pad mist eliminators. The droplets collect and coalesce on the chevron blades or mesh. When the droplets become large enough, they fall by gravity or capillary action. All mist eliminators require periodic washing to remove buildup of PM. Mist eliminators are used to remove large condensed droplet from a gas stream and will be considered for mist control in this BACT evaluation.

The exhaust stream is already wet; therefore, a wet scrubber would introduce additional water usage. For this reason, wet scrubbers are less preferrable BACT than mist eliminators.

Step 5 – Select BACT

Mist eliminator is the highest ranking control technology and is selected as BACT. No additional technologies will be considered for this source.

AMC proposes BACT as mist eliminators with a limit of 0.11 lb/hr PM_{10} and 0.0004 lb/hr $PM_{2.5}$ emissions for this source.

1.2.15 BACT DETERMINATION FOR HYDROGEN PURGING

After cleaning, the strip is annealed in a fully electric furnace with hydrogen atmosphere. The strip is progressively heated to and held at the required temperature using only electrical heating elements, and then cooled at a controlled rate. The heating, soaking, and cooling sections of the furnace are all under atmosphere control. The furnace is tightly sealed and kept under positive pressure of inert atmosphere. During operation, HNx gas is permanently injected into the furnace, and the atmosphere will be exhausted only from sections operated with lower hydrogen content. No atmosphere will be exhausted from the high hydrogen content sections. There are no emissions from the annealing furnace during normal operations because of the fully electric technology. Only emissions generated by gas purging, when required, are vented.

1.2.15.1 HYDROGEN PURGING NO_X BACT

Step 1 – Identify Potential Control Technologies

NO_x emissions result from hydrogen purging. The following technologies are potentially available controls for NO_x emissions from gas purging.

TABLE 1-28 POTENTIAL CONTROL DEVICES FOR NO_X FROM HYDROGEN PURGING

Control Type	Estimated NO_x Control Efficiency
Use of Air-Assisted or Steam-Assisted Flare	Varies
Flare gas recovery	Varies
Proper equipment design and operation	Base Case

Each of the identified control techniques are described below.

- ***Use of Air-Assisted or Steam-Assisted Flare -*** Criteria pollutant emissions primarily result from incomplete combustion. An air-assisted or steam-assisted flare can enhance the fuel-to-air mixing ratio which in turn ensures complete combustion.
- ***Flare Gas Recovery -*** Normal flaring and scheduled maintenance can be reduced by using a flare gas recovery system. Typical flare gas recovery systems include compressors, flow control devices, and piping which function to recover gas which is commonly used in turn as supplemental fuel. Several types of compressors can be used including reciprocating, screw, liquid ring, and sliding vane. According to vendor literature, flare gas recovery systems require intensive engineering analyses.
- ***Proper Equipment Design and Operation –*** Higher NO_x emissions result from poor equipment design, firing conditions, or compromised seals. Through proper equipment maintenance, inspections, and operation, the formation of NO_x can be controlled at an acceptable level.

In flare systems, NO_x emissions can also be reduced through the implementation of a flare minimization plan. Another resource for implementing proper equipment design, proper operation, and good combustion practices is to follow the specifications of 40 C.F.R. § 60.18 which outlines work practice standards for control devices.

Furthermore, NO_x emissions can be minimized by ensuring proper burner set-up, adjustment, and maintenance. Burner optimization is achieved by modifying flare-operating conditions, controlling excess air, tuning, and balancing the fuel and air flow to the combustion zone.

Step 2 – Eliminate Technically Infeasible Options

Flare Gas Recovery

Degassing operations will be equipped with flares to destruct CO emissions from different steel grades. Thus, the gas streams routed to the flares will be variable. Due to the nature of the flaring scenario, re-routing the flare gas to the fuel gas system can be eliminated because it is not applicable to the source type under consideration.

Step 3 – Rank Remaining Technically Feasible Control Options

Proper equipment design and operation is the only remaining control.

Step 4 – Evaluate Remaining Control Technologies

According to RBLC inquiry results, proper equipment design and operation has been recently selected as BACT for several degassing operations. No RBLC entries for this operation included the use of air or steam assisted flares. Air and steam assisted flares are typically used in the oil and gas industry for the disposal of heavier hydrocarbon gasses. The proposed flares will be non-assisted. BACT limit for Vacuum Tank Degassers and Flares contained in the RBLC is 0.098 lb NO_x/MMBtu.

As such, AMC proposes BACT to be proper equipment design and operation, with a numerical NO_x emissions limit of 0.064 lb NO_x/MMBtu.

Step 5 – Selection of BACT

AMC will utilize proper equipment design and operation with a numerical emissions limit of 0.064 lb NO_x/MMBtu as BACT for NO_x emissions from hydrogen purging. This limit is equivalent to 0.22 lb/hr NO_x IH1/IH2 and 0.37 lb/hr NO_x IH2/EHS, RTC/RJC, Entry Seal, and Exit Seal.

APPENDIX E RBLC TABLES

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Cold Rolling Mill - Fume Exhaust
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
OUTOKUMPU STAINLESS USA, LLC	--[1]	LO51 - Cold Rolling Mill	0	-	Mist Eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0025	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LO51 - Cold Rolling Mill	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0024	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LO51 - Cold Rolling Mill	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0013	GR/DSCF
NUCOR STEEL ARKANSAS	9/1/2021	SN-53. SM-206, SN-207 Cold Tempering and Reversing Mills	0	-	Mist Eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0012	GR/DSCF
NUCOR STEEL ARKANSAS	9/1/2021	SN-53. SM-206, SN-207 Cold Tempering and Reversing Mills	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0022	GR/DSCF
NUCOR STEEL ARKANSAS	9/1/2021	SN-53. SM-206, SN-207 Cold Tempering and Reversing Mills	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0019	GR/DSCF
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	CCM: FIVE-STAND COLD REDUCTION MILL	660	T/H	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0214	GR/DSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Reduction Mill (EP 21-16)	1,000,000	tons/yr	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. This unit is equipped with a mist eliminator.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0025	GR/DSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Reduction Mill (EP 21-16)	1,000,000	tons/yr	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. This unit is equipped with a mist eliminator.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0024	GR/DSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Reduction Mill (EP 21-16)	1,000,000	tons/yr	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. This unit is equipped with a mist eliminator.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0013	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Cold Reversing Mills/Cold Mill (cold mill monovent)	0	-	Proper Operation and Maintenance	PARTICULATE MATTER, FILTERABLE (FPM)	0.0002	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Cold Reversing Mills/Cold Mill (cold reversing mill no. 1)	0	-	Fan with Mist Eliminator No.1 (existing) and Fan with Mist Eliminator No. 2 (new). Proper Operation and Maintenance.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0100	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Cold Reversing Mills/Cold Mill (cold reversing mill no. 1)	0	-	Fan with Mist Eliminator No. 1 (existing); Fan with Mist Eliminator No. 2 (new); and Proper Operation and Maintenance.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0063	GR/DSCF
SDSW STEEL MILL	11/12/2020	TANDUM COLD MILL	0	-	Mist Eliminator Scrubber	PARTICULATE MATTER, FILTERABLE (FPM)	0.0100	GR/DSCF
SDSW STEEL MILL	11/12/2020	TANDUM COLD MILL	0	-	Mist Eliminator Scrubber	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0066	GR/DSCF
SDSW STEEL MILL	11/12/2020	TANDUM COLD MILL	0	-	Mist Eliminator Scrubber	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0066	GR/DSCF

[1]Note: Outokumpu PSD Application submitted July 2023. Permit not yet issued.

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
OUTOKUMPU STAINLESS USA, LLC	--[(1)]	LO41B - Annealing Furnaces - Passive	0	-	Good Combustion Practice	PARTICULATE MATTER, FILTERABLE (FPM)	1.9000	LB/MMSCF
OUTOKUMPU STAINLESS USA, LLC	--[(1)]	LO41B - Annealing Furnaces - Passive	0	-	Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	7.6000	LB/MMSCF
OUTOKUMPU STAINLESS USA, LLC	--[(1)]	LO41B - Annealing Furnaces - Passive	0	-	Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	7.6000	LB/MMSCF
OUTOKUMPU STAINLESS USA, LLC	--[(1)]	LA44 - Annealing Furnaces - Continuous	0	-	Good Combustion Practice	PARTICULATE MATTER, FILTERABLE (FPM)	1.9000	LB/MMSCF
OUTOKUMPU STAINLESS USA, LLC	--[(1)]	LA44 - Annealing Furnaces - Continuous	0	-	Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	7.6000	LB/MMSCF
OUTOKUMPU STAINLESS USA, LLC	--[(1)]	LA44 - Annealing Furnaces - Continuous	0	-	Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	7.6000	LB/MMSCF
NUCOR STEEL	3/30/2023	Annealing Furnace for Galvanizing Line	53	MMBtu/hr	good combustion practices and only pipeline quality natural gas shall be combusted	PARTICULATE MATTER, FILTERABLE (FPM)	0.0012	LB/MMBTU
NUCOR STEEL	3/30/2023	Annealing Furnace for Galvanizing Line	53	MMBtu/hr	good combustion practices and only pipeline quality natural gas shall be combusted	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0012	LB/MMBTU
NUCOR STEEL	3/30/2023	Annealing Furnace for Galvanizing Line	53	MMBtu/hr	good combustion practices and only pipeline quality natural gas shall be combusted	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0012	LB/MMBTU
WEST VIRGINIA STEEL MILL	5/5/2022	Box Annealing Furnaces	5	mmbtu/hr	PNG□ Good Combustion Practices	PARTICULATE MATTER, TOTAL (TPM)	0.0400	LB/HR
BIG RIVER STEEL LLC	1/31/2022	Batch Annealing Furnaces	0	-	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, FILTERABLE (FPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Batch Annealing Furnaces	0	-	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Batch Annealing Furnaces	0	-	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0075	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-209 Annealing Furnaces	0	-	Good Combustion Practice	PARTICULATE MATTER, FILTERABLE (FPM)	0.0019	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-209 Annealing Furnaces	0	-	Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0076	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-209 Annealing Furnaces	0	-	Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0076	LB/MMBTU
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Annealing Furnaces (15) (EP 21-15)	5	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, FILTERABLE (FPM)	1.9000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Annealing Furnaces (15) (EP 21-15)	5	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL < 10 (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Annealing Furnaces (15) (EP 21-15)	5	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	7.6000	LB/MMSCF
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Drying Furnace	15	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL (TPM)	0.0160	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Drying Furnace	15	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0160	LB/MMBTU

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Drying Furnace	15	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0160	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Furnaces	118	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Furnaces	118	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Furnaces	118	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Pickling Line Furnace Section	66	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL (TPM)	0.0130	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Pickling Line Furnace Section	66	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0130	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Pickling Line Furnace Section	66	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0130	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Furnace Section	13	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL (TPM)	0.0130	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Furnace Section	13	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0130	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Furnace Section	13	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0130	LB/MMBTU
SDSW STEEL MILL	1/17/2020	Annealing Furnace AND Tunnel Furnaces	0	-	GOOD COMBUSTION PRACTICES, CLEAN FUEL	PARTICULATE MATTER, TOTAL (TPM)	0.0075	LB/MMBTU
SDSW STEEL MILL	1/17/2020	Annealing Furnace AND Tunnel Furnaces	0	-	GOOD COMBUSTION PRACTICES, CLEAN FUEL	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0075	LB/MMBTU
SDSW STEEL MILL	1/17/2020	Annealing Furnace AND Tunnel Furnaces	0	-	GOOD COMBUSTION PRACTICES, CLEAN FUEL	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	FURNACES SN-39, ANNEALING	85	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	PARTICULATE MATTER, FILTERABLE (FPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	FURNACES SN-39, ANNEALING	85	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	FURNACES SN-39, ANNEALING	85	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0075	LB/MMBTU
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanizing line/galvanneal furnace)	21	MMBtu/hr		PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanneal furnace 2)	0	-	Good Combustion Practices	PARTICULATE MATTER, FILTERABLE (FPM)	1.9000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanneal furnace 2)	0	-	Good Combustion Practices	PARTICULATE MATTER, TOTAL < 10 (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanneal furnace 2)	0	-	Good Combustion Practices	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	7.6000	LB/MMSCF
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	HYDROGEN BATCH ANNEALING FURNACES NOS. 16, 17, AND 18	7	MMBTU/H EACH	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, FILTERABLE (FPM)	0.0019	LB/MMBTU
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	HYDROGEN BATCH ANNEALING FURNACES NOS. 16, 17, AND 18	7	MMBTU/H EACH	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0076	LB/MMBTU

[1] Note: Outokumpu PSD Application submitted July 2023. Permit not yet issued.

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS

Summary of RBLC Results for NOx Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
OUTOKUMPU STAINLESS USA, LLC	--[1]	LO41B - Annealing Furnaces - Passive	0	-	Ultra-low NOx burners and exhaust gas re-circulation	0.1100	LB/MMBTU
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA44 - Annealing Furnaces - Continuous	0	-	Ultra-low NOx burners and exhaust gas re-circulation	0.0600	LB/MMBTU
NUCOR STEEL	3/30/2023	Annealing Furnace for Galvanizing Line	53	MMBtu/hr	low NOx burners and good combustion practices	0.0500	LB/MMBTU
WEST VIRGINIA STEEL MILL	5/5/2022	Box Annealing Furnaces	5	mmbtu/hr	LNB Good Combustion Practices	0.2500	LB/HR
BIG RIVER STEEL LLC	1/31/2022	Batch Annealing Furnaces	0	-	Low NOx burners Combustion of clean fuel Good Combustion Practices	0.1000	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-209 Annealing Furnaces	0	-	Low NOx burners	0.0915	LB/MMBTU
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Annealing Furnaces (15) (EP 21-15)	5	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan. This unit is equipped with low-NOx burners.	50.0000	LB/MMSCF
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Drying Furnace	15	MMBtu/hr	Low NOx burners Combustion of clean fuel Good Combustion Practices	0.2500	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Furnaces	118	MMBtu/hr	Low NOx burners Combustion of clean fuel Good Combustion Practices	0.1000	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Pickling Line Furnace Section	66	MMBtu/hr	Low NOx burners SCR Combustion of clean fuel Good Combustion Practices	0.1000	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Furnace Section	13	MMBtu/hr	Low NOx burners SCR Combustion of clean fuel Good Combustion Practices	0.1000	LB/MMBTU
SDSW STEEL MILL	1/17/2020	Annealing Furnace AND Tunnel Furnaces	0	-	GOOD COMBUSTION PRACTICES, CLEAN FUEL	0.1000	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	FURNACES SN-39, ANNEALING	85	MMBTU/HR	LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.1000	LB/MMBTU
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanneal furnace 2)	0	-	Use of Low NOx Burners and Good Combustion Practices	50.0000	LB/MMSCF
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	HYDROGEN BATCH ANNEALING FURNACES NOS. 16, 17, AND 18	7	MMBTU/H EACH	LOW NOX BURNERS	0.1000	LB/MMBTU

[1]Note: Outokumpu PSD Application submitted July 2023. Permit not yet issued.

Summary of RBLC Results for VOC Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

VOC Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
BIG RIVER STEEL LLC	11/7/2018	FURNACES SN-39, ANNEALING	85	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Drying Furnace	15	MMBtu/hr	Combustion of Natural gas □ RTO	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Furnaces	118	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing Pickling Line Furnace Section	66	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Annealing and Coating Line Furnace Section	13	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-209 Annealing Furnaces	0	-	Good Combustion Practice	0.0055	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Batch Annealing Furnaces	0	-	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	HYDROGEN BATCH ANNEALING FURNACES NOS. 16, 17, AND 18	7	MMBTU/H EACH	GOOD COMBUSTION PRACTICES	0.0055	LB/MMBTU
NUCOR STEEL	3/30/2023	Annealing Furnace for Galvanizing Line	53	MMBtu/hr	good combustion practices and only pipeline quality natural gas fuel shall be combusted	0.0054	LB/MMBTU
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Annealing Furnaces (15) (EP 21-15)	5	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	5.5000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanizing line/galvanneal furnace)	21	MMBtu/hr		0.0000	
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanneal furnace 2)	0	-	Good Combustion Practices	5.5000	LB/MMSCF
SDSW STEEL MILL	1/17/2020	Annealing Furnace AND Tunnel Furnaces	0	-	GOOD COMBUSTION PRACTICES, CLEAN FUEL	0.0054	LB/MMBTU
WEST VIRGINIA STEEL MILL	5/5/2022	Box Annealing Furnaces	5	mmbtu/hr	Good Combustion Practices	0.0300	LB/HR

Summary of RBLC Results for VOC Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
OUTOKUMPU STAINLESS USA, LLC	--[1]	LO41B - Annealing Furnaces - Passive	0	-	Good Combustion Practices	15770.0000	TONS/YR
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA44 - Annealing Furnaces - Continuous	0	-	Good Combustion Practices	73695.0000	TONS/YR
EXPLORATORY VENTURES LLC	3/5/2024	AHSS Continuous Galvanizing Line Preheat Furnace #2	140	MMBtu/hr	Good operating practices	117.0000	LB/MMBTU
EXPLORATORY VENTURES, LLC	10/11/2023	AHSS Continuous Galvanizing Line Preheat Furnace #1	140	MMBtu/hr	Good operating practices	117.0000	LB/MMBTU
HYBAR LLC	4/28/2023	Electric Arc Furnace #1 and Ladle Furnace #1	0		Good operating practices	109311.0000	TPY CO2E
HYBAR LLC	4/28/2023	Hydrogen Reformer Furnaces	13	MMBtu/hr	Good operating practices	117.0000	LB/MMBTU
NUCOR STEEL	3/30/2023	Tunnel Furnace No. 1	502	tons/hour	good combustion practices and only pipeline quality natural gas fuel shall be combusted	117.1000	LB/MMBTU
NUCOR STEEL	3/30/2023	Annealing Furnace for Galvanizing Line	53	MMBtu/hr	good combustion practices and only pipeline quality natural gas fuel shall be combusted	117.1000	LB/MMBTU
WEST VIRGINIA STEEL MILL	5/5/2022	Hot Mill Tunnel Furnace	150	mmbtu/hr	PNG□ Good Combustion Practices	17565.0000	LB/HR
WEST VIRGINIA STEEL MILL	5/5/2022	Galvanizing Furnaces	64	mmbtu/hr	PNG□ Good Combustion Practices	7494.0000	LB/HR
WEST VIRGINIA STEEL MILL	5/5/2022	Box Annealing Furnaces	5	mmbtu/hr	PNG□ Good Combustion Practices	585.0000	LB/HR
BIG RIVER STEEL LLC	1/31/2022	Hydrogen Plant #2 Reformer Furnace	75	MMBtu/hr	Good Operating Practices	117.0000	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Furnace Dedusting	0		Good Operating Practices	54701.0000	TPY
BIG RIVER STEEL LLC	1/31/2022	Batch Annealing Furnaces	0		Good operating practices	117.0000	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-209 Annealing Furnaces	0		Good Combustion Practices	121.0000	LB/MMBTU
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Radiant Tube Furnace (EP 21-08B)	36	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	18660.0000	TONS/YR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Annealing Furnaces (15) (EP 21-15)	5	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	37581.0000	TONS/YR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Preheat Furnace (EP 21-08A)	94	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	48725.0000	TONS/YR
NUCOR STEEL GALLATIN, LLC	4/19/2021	A-Line Tunnel Furnace (EP 02-01)	104	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	54065.0000	TONS/YR

Summary of RBLC Results for VOC Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
NUCOR STEEL GALLATIN, LLC	4/19/2021	B-Line Tunnel Furnace (EP 02-02)	163	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	84544.0000	TONS/YR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Heated Transfer Table Furnace (EP 02-03)	66	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	33952.0000	TONS/YR
NUCOR STEEL KANKAKEE, INC.	1/25/2021	Electric Arc Furnace (EAF)	1,226,400	tons/year	Operation with automated process/operation and burner control system and natural gas combustion	438.0000	LBS/TON
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 05-01 - Group 1 Car Bottom Furnaces #1 - #3	28	MMBtu/hr, each	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan and meet design requirements.	43542.0000	TON/YR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 03-01 - Walking Beam Reheat Furnace (Including Cold Starts)	400	MMBtu/hr	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan and meet design standards.	189598.0000	TON/YR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 04-02 - Austenitizing Furnace	54	MMBtu/hr	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan and implement design standards.	27991.0000	TON/YR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 05-02 - Group 2 Car Bottom Furnaces A & B	60	MMBtu/hr, combined	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan and meet design requirements.	31101.0000	TON/YR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 03-02 - Ingot Car Bottom Furnaces #1-#4	37	MMBtu/hr, each	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan and meet design standards.	76717.0000	TON/YR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 03-05 - Steckel Mill Coiling Furnaces #1 & #2	18	MMBtu/hr, each	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	18142.0000	TON/YR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 04-03 - Tempering Furnace	48	MMBtu/hr	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan and meet design requirements.	24881.0000	TON/YR

Summary of RBLC Results for VOC Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
SDSW STEEL MILL	1/17/2020	Electric Arc Furnaces (EAF)	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	0.0000	
SDSW STEEL MILL	1/17/2020	Annealing Furnace AND Tunnel Furnaces	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	117.1000	LB/MMBTU
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Tunnel Furnace #2 (P018)	88	MMBTU/H	Use of natural gas and energy efficient design	10283.0600	LB/H
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Electric Arc Furnace #2 (P905)	250	T/H	Implementation of the following low-emitting processes, system designs, management practices and methods for EAF and LMF operations resulting in an overall emission rate of 292 lbs CO2e/ton of liquid steel produced. (a)furnace design â€" single bucket batch charging; (b)oxy-fuel burners â€" supplement of chemical energy thru scrap preheating and carbon/oxygen injection; (c)foamy slag practice â€" increased electrical efficiency and reduced radiant heat loss; (d)real-time off-gas analysis and closed-loop process control of oxygen flow and air ingress â€" regulates energy input and post-combustion temperature and composition; (e)ultra-high-power transformer â€" lower power-on times due to faster melting of scrap; (f)eccentric bottom tapping â€" lower treatment requirements in LMF due to reduced slag carryover from tapping; (g)heel practice â€" higher retention of liquid heel heats scrap faster resulting in quick arc stabilization.	73000.0000	LB/H
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Tunnel Furnace (P001)	112	MMBTU/H	Use of natural gas and energy efficient design	13087.2000	LB/H
NUCOR STEEL DECATUR, LLC	8/14/2019	Electric Arc Furnaces	0			504000.0000	TONS/YEAR
NUCOR STEEL ARKANSAS	2/14/2019	SN-219 Galvanizing Line No, 2 Furnace	128	MMBTU/hr	Good Combustion Practices	121.0000	LB/MMBTU
NUCOR STEEL KANKAKEE, INC.	11/1/2018	Natural Gas-Fired Reheat Furnace	126	mmBtu/hr	Energy efficient design and operation with automated process/operational and burner control system	65200.0000	TONS
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanneal furnace 2)	0		Use of natural gas and efficient combustion technology through good combustion practices.	11404.0000	TPY
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanizing line 2 furnace)	0		Use of natural gas and efficient combustion technology through good combustion practices.	51162.0000	TPY
NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	Electric Arc Furnace	0			378621.0000	TON/YEAR
NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	Austenitizing Furnace (40.6 MMBtu/hr)	0			20828.0000	TONS/YEAR
NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	Tempering Furnace (35 MMBtu/hr)	0			17955.0000	TONS/YEAR
NUCOR STEEL TUSCALOOSA, INC.	3/9/2017	Car Bottom Furnaces (45 MMBtu/hr, each)	0			46169.0000	TON/YEAR

Summary of RBLC Results for VOC Emissions from Annealing Furnace
Process Type: 81.290 - Other Steel Manufacturing Processes

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
GERDAU MACSTEEL, INC.	10/27/2014	EUBILLET-REHEAT (Walking Beam Billet Reheat Furnace)	261	MMBTU/H total burner capacity		119.0000	LB/MMBTU

(1)Note: Outokumpu PSD Application submitted July 2023. Permit not yet issued.

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Shot Blaster
Process Type: 99.001 - Abrasive Blasting

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA45 - MAPL Shot Blaster	0	-	Baghouse	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA45 - MAPL Shot Blaster	0	-	Baghouse	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	14.3%	Percentage of PM Emissions
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA45 - MAPL Shot Blaster	0	-	Baghouse	PARTICULATE MATTER, FILTERABLE (FPM)	14.3%	Percentage of PM Emissions
NUCOR STEEL BRANDENBURG	7/23/2020	EP 04-01 - Shot Blaster	180,000	tons shot consumed/yr	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control particulate grain loading to 0.003 gr/dscf at an exhaust flow rate of 15,786 scfm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
NUCOR STEEL BRANDENBURG	7/23/2020	EP 04-01 - Shot Blaster	180,000	tons shot consumed/yr	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control particulate grain loading to 0.003 gr/dscf at an exhaust flow rate of 15,786 scfm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0030	GR/DSCF
NUCOR STEEL BRANDENBURG	7/23/2020	EP 04-01 - Shot Blaster	180,000	tons shot consumed/yr	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control particulate grain loading to 0.003 gr/dscf at an exhaust flow rate of 15,786 scfm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0030	GR/DSCF

[1]Note: Outokumpu PSD Application submitted July 2023. Permit not yet issued.

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Pickling Line
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA46 - MAPL H2SO4 Pickling	0		Wet Scrubber	Particulate matter, filterable (FPM)	0.0022	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA46 - MAPL H2SO4 Pickling	0		Wet Scrubber	Particulate matter, total (TPM10)	0.0022	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA46 - MAPL H2SO4 Pickling	0		Wet Scrubber	Particulate matter, total (TPM2.5)	0.0022	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA46 - MAPL HNO3/HF Pickling	0		Wet Scrubber	Particulate matter, filterable (FPM)	0.0022	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA46 - MAPL HNO3/HF Pickling	0		Wet Scrubber	Particulate matter, total (TPM10)	0.0022	GR/DSCF
OUTOKUMPU STAINLESS USA, LLC	--[1]	LA46 - MAPL HNO3/HF Pickling	0		Wet Scrubber	Particulate matter, total (TPM2.5)	0.0022	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Push Pull Pickle Line	0		Baghouse Scrubber	Particulate matter, filterable (FPM)	0.0022	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Push Pull Pickle Line	0		Baghouse Scrubber	Particulate matter, total (TPM10)	0.0022	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Push Pull Pickle Line	0		Baghouse Scrubber	Particulate matter, total (TPM2.5)	0.0022	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Push Pull Pickle Line	0		Baghouse Scrubber	Visible Emissions (VE)	5.0000	%
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Scale Dust and Pickling Section	0		Fabric Filter Scrubber	Particulate matter, filterable (FPM)	0.0022	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Scale Dust and Pickling Section	0		Fabric Filter Scrubber	Particulate matter, total (TPM10)	0.0022	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Scale Dust and Pickling Section	0		Fabric Filter Scrubber	Particulate matter, total (TPM2.5)	0.0022	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Scale Dust and Pickling Section	0		Fabric Filter Scrubber	Visible Emissions (VE)	5.0000	%
SDSW STEEL MILL	1/17/2020	PICKLING OPERATIONS	0		Mist Eliminator Scrubber	Particulate matter, total (TPM)	0.0100	GR/DSCF
SDSW STEEL MILL	1/17/2020	PICKLING OPERATIONS	0		Mist Eliminator Scrubber	Particulate matter, total (TPM10)	0.0100	GR/DSCF
SDSW STEEL MILL	1/17/2020	PICKLING OPERATIONS	0		Mist Eliminator Scrubber	Particulate matter, total (TPM2.5)	0.0100	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3)	0		Wet Scrubber and Mist Eliminator; Proper Operation and Maintenance	Particulate matter, filterable (FPM)	0.0100	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3)	0		Wet Scrubber and Mist Eliminator; Proper Operation and Maintenance	Particulate matter, total (TPM10)	0.0320	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3)	0		Wet Scrubber and Mist Eliminator; Proper Operation and Maintenance	Particulate matter, total (TPM2.5)	0.0290	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 1)	0		Wet Fume Scrubber No. 1, contains 4 trays and a mist eliminator. Proper Operation and Maintenance.	Particulate matter, filterable (FPM)	0.0100	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 1)	0		Wet Fume Scrubber No. 1, contains 4 trays and a mist eliminator. Proper Operation and Maintenance.	Particulate matter, filterable (FPM10)	0.0055	GR/DSCF
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	APL: ELECTROLYTIC PICKLING	130	T/H	WET SCRUBBER	Particulate matter, total (TPM10)	2.6050	LB/H

[1]Note: Outokumpu PSD Application submitted July 2023. Permit not yet issued.

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Tank Farm
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickling Line #2 (including storage tanks) (EP 21-02)	1,314,000	tons/yr	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. This unit is equipped with a scrubber and mist eliminator.	Particulate matter, filterable (FPM)	0.0015	GR/DSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickling Line #2 (including storage tanks) (EP 21-02)	1,314,000	tons/yr	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. This unit is equipped with a scrubber and mist eliminator.	Particulate matter, total (TPM10)	0.0013	GR/DSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickling Line #2 (including storage tanks) (EP 21-02)	1,314,000	tons/yr	The permittee must develop a Good Work Practices (GWP) Plan to minimize emissions. This unit is equipped with a scrubber and mist eliminator.	Particulate matter, total (TPM2.5)	0.0012	GR/DSCF
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	CPL: HCL PICKLE BATHS AND RINSE TANKS	476	T/H	WET SCRUBBER SYSTEM (WET SCRUBBER AND MIST ELIMINATOR) AND PICKLING BATHS AND RINSE TANKS ENCLOSED AND MAINTAINED UNDER NEGATIVE PRESSURE	Particulate matter, total (TPM10)	1.1350	LB/H
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	APL: MIXED ACID PICKLE AND RINSE TANK	130	T/H	WET SCRUBBER SYSTEM (WET SCRUBBER AND MIST ELIMINATOR) & MIXED ACID PICKLE AND RINSE TANKS SHALL BE ENCLOSED AND MAINTAINED UNDER NEGATIVE PRESSURE	Particulate matter, total (TPM10)	0.6830	LB/H

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Anneal and Coating Line – Cleaning Section
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL	3/30/2023	Cleaning Section for Galvanizing Line	76	tons per hour	wet scrubber	PARTICULATE MATTER, TOTAL (TPM)	0.0030	GR/DSCF
NUCOR STEEL	3/30/2023	Cleaning Section for Galvanizing Line	76	tons per hour	wet scrubber	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
NUCOR STEEL	3/30/2023	Cleaning Section for Galvanizing Line	76	tons per hour	wet scrubber	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0030	GR/DSCF
NUCOR STEEL	3/30/2023	Precleaning and Cleaning Section for Sheet Metal Coating Line	74	tons per hour	wet scrubber	PARTICULATE MATTER, TOTAL (TPM)	0.0030	GR/DSCF
NUCOR STEEL	3/30/2023	Precleaning and Cleaning Section for Sheet Metal Coating Line	74	tons per hour	wet scrubber	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
NUCOR STEEL	3/30/2023	Precleaning and Cleaning Section for Sheet Metal Coating Line	74	tons per hour	wet scrubber	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Caustic Cleaning and Post Treatment	0	-	Mist Eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Caustic Cleaning and Post Treatment	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Caustic Cleaning and Post Treatment	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Pre and Post Cleaning	0	-	Mist Eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Pre and Post Cleaning	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Pre and Post Cleaning	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Coil Coating - Pre and Post Cleaning	0	-	Mist Eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Coil Coating - Pre and Post Cleaning	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	1/31/2022	Coil Coating - Pre and Post Cleaning	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0030	GR/DSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Alkali Cleaning Section Heater (EP 21-07B)	23	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, FILTERABLE (FPM)	1.9000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Alkali Cleaning Section Heater (EP 21-07B)	23	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL < 10 (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Galvanizing Line #2 Alkali Cleaning Section Heater (EP 21-07B)	23	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	7.6000	LB/MMSCF
BIG RIVER STEEL LLC	3/17/2021	Galvanizing Line Caustic Cleaning #1 and #2 Pre-Cleaning	0	MMBtu/hr	Mist Eliminator	PARTICULATE MATTER, TOTAL (TPM)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	3/17/2021	Galvanizing Line Caustic Cleaning #1 and #2 Pre-Cleaning	0	MMBtu/hr	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0300	GR/DSCF
BIG RIVER STEEL LLC	3/17/2021	Galvanizing Line Caustic Cleaning #1 and #2 Pre-Cleaning	0	MMBtu/hr	Mist Eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0300	GR/DSCF
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Pre-cleaning and Cleaning Sections	0	-	Mist eliminator Good operating practices	PARTICULATE MATTER, TOTAL (TPM)	0.0030	GR/DSCF

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Anneal and Coating Line – Cleaning Section
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Pre-cleaning and Cleaning Sections	0	-	Mist eliminator Good operating practices	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Pre-cleaning and Cleaning Sections	0	-	Mist eliminator Good operating practices	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0300	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (glavanizing line 2 cleaning section heaters)	0	-	Good Combustion Practices	PARTICULATE MATTER, FILTERABLE (FPM)	1.9000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (glavanizing line 2 cleaning section heaters)	0	-	Good combustion practices	PARTICULATE MATTER, TOTAL < 10 (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (glavanizing line 2 cleaning section heaters)	0	-	Good combustion practices	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	7.6000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanizing line 2 cleaning section)	0	-	Mist Eliminator; Proper Operation and Maintenance	PARTICULATE MATTER, FILTERABLE (FPM)	0.0030	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanizing line 2 cleaning section)	0	-	Mist Eliminator; Proper Operation and Maintenance	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0030	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanizing line 2 cleaning section)	0	-	Mist Eliminator; Proper Operation and Maintenance	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0030	GR/DSCF
NUCOR STEEL - BERKELEY	5/4/2018	Galvanizing Line Equipment (galvanizing line/alkali cleaning section heaters)	10	MMBtu/hr		PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	APL: ALKALINE CLEANER	130	T/H	WET SCRUBBER	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0333	GR/DSCF
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	APL: SKIN PASS TEMPER MILL & ROLL CLEANING DUST COLLECTION	130	T/H	BAGHOUSE	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0180	GR/DSCF
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	CGL: GALVANIZING LINE ALKALINE CLEANING	184	T/H	WET SCRUBBER	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0092	GR/DSCF

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Cooling Tower
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
AM/NS CALVERT, LLC	--[1]	Cooling Tower	0	-	Drift eliminators	PARTICULATE MATTER, TOTAL (TPM)	0.0005	% DRIFT LOSS
AM/NS CALVERT, LLC	--[1]	Cooling Tower	0	-	Drift eliminators	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	% DRIFT LOSS
AM/NS CALVERT, LLC	--[1]	Cooling Tower	0	-	Drift eliminators	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	% DRIFT LOSS
EXPLORATORY VENTURES LLC	3/5/2024	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL (TPM)	0.0005	% DRIFT LOSS
EXPLORATORY VENTURES LLC	3/5/2024	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	% DRIFT LOSS
EXPLORATORY VENTURES LLC	3/5/2024	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	% DRIFT LOSS
BIG RIVER STEEL LLC	2/8/2024	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL (TPM)	0.0005	% DRIFT LOSS
BIG RIVER STEEL LLC	2/8/2024	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	% DRIFT LOSS
BIG RIVER STEEL LLC	2/8/2024	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	% DRIFT LOSS
HYBAR LLC	4/28/2023	Cooling Towers	0	-	Drift eliminators and low TDS	PARTICULATE MATTER, FILTERABLE (FPM)	0.0005	% DRIFT LOSS
HYBAR LLC	4/28/2023	Cooling Towers	0	-	Drift eliminators and low TDS	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	% DRIFT LOSS
HYBAR LLC	4/28/2023	Cooling Towers	0	-	Drift eliminators and low TDS	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	% DRIFT LOSS
NUCOR STEEL	3/30/2023	laminar cooling tower (contact type)	31,600	gallons/minute	high efficiency drift eliminators	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0050	DRIFT LOSS RATE (%)
NUCOR STEEL	3/30/2023	laminar cooling tower (contact type)	31,600	gallons/minute	high efficiency drift eliminators	PARTICULATE MATTER, TOTAL (TPM)	0.0050	DRIFT LOSS RATE (%)
NUCOR STEEL	3/30/2023	laminar cooling tower (contact type)	31,600	gallons/minute	high efficiency drift eliminators	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0050	DRIFT LOSS RATE (%)
NUCOR STEEL ARKANSAS	11/21/2022	Cooling tower, SN-241	0	-	Mist Eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0005	% DRIFT LOSS
NUCOR STEEL ARKANSAS	11/21/2022	Cooling tower, SN-241	0	-	Mist Eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	% DRIFT LOSS
NUCOR STEEL ARKANSAS	11/21/2022	Cooling tower, SN-241	0	-	mist eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	% DRIFT LOSS
WEST VIRGINIA STEEL MILL	5/5/2022	Cooling Towers	90,000	gpm	High Efficiency Drift Eliminator at 0.0005%.	PARTICULATE MATTER, TOTAL (TPM)	0.0000	
BIG RIVER STEEL LLC	1/31/2022	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, FILTERABLE (FPM)	0.0005	DRIFT LOSS
BIG RIVER STEEL LLC	1/31/2022	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	
BIG RIVER STEEL LLC	1/31/2022	Cooling Towers	0	-	Drift Eliminators□ Low TDS	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	DRIFT LOSS
NUCOR STEEL ARKANSAS	9/1/2021	SN-212 Cooling Tower	0	-	High efficiency Drift/mist eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0005	% DRIFT LOSS

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Cooling Tower
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL ARKANSAS	9/1/2021	SN-212 Cooling Tower	0	-	High efficiency Drift/mist eliminator	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	% DRIFT LOSS
NUCOR STEEL ARKANSAS	9/1/2021	SN-212 Cooling Tower	0	-	High efficiency Drift/mist eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	% DRIFT LOSS
NUCOR STEEL GALLATIN, LLC	4/19/2021	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	35,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, FILTERABLE (FPM)	0.2700	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	35,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1900	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	35,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0006	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	26,300	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, FILTERABLE (FPM)	0.1700	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	26,300	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1200	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	26,300	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0004	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	59,500	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, FILTERABLE (FPM)	0.3900	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	59,500	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2900	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	59,500	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0008	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Cooling Tower (EP 03-12)	20,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, FILTERABLE (FPM)	0.1400	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Cooling Tower (EP 03-12)	20,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0940	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Cooling Tower (EP 03-12)	20,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0003	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Air Separation Plant Cooling Tower (EP 03-13)	15,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, FILTERABLE (FPM)	0.0800	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Air Separation Plant Cooling Tower (EP 03-13)	15,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0700	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Air Separation Plant Cooling Tower (EP 03-13)	15,000	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0002	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	DCW Auxiliary Cooling Tower (EP 03-14)	9,250	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, FILTERABLE (FPM)	0.0600	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	DCW Auxiliary Cooling Tower (EP 03-14)	9,250	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0500	LB/HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	DCW Auxiliary Cooling Tower (EP 03-14)	9,250	gal/min	Mist Eliminator, 0.001% drift loss	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	LB/HR
BIG RIVER STEEL LLC	3/17/2021	Contact Cooling Tower	75,000	gal/hr	Drift Eliminators Low TDS	PARTICULATE MATTER, TOTAL (TPM)	0.0010	% DRIFT LOSS
BIG RIVER STEEL LLC	3/17/2021	Contact Cooling Tower	75,000	gal/hr	Drift Eliminators Low TDS	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0010	% DRIFT LOSS
BIG RIVER STEEL LLC	3/17/2021	Contact Cooling Tower	75,000	gal/hr	Drift Eliminators Low TDS	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0010	% DRIFT LOSS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-01 - Melt Shop ICW Cooling Tower	52,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.3600	LB/HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Cooling Tower
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-01 - Melt Shop ICW Cooling Tower	52,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2700	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-01 - Melt Shop ICW Cooling Tower	52,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0008	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-02 - Melt Shop DCW Cooling Tower	5,900	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0400	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-02 - Melt Shop DCW Cooling Tower	5,900	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0300	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-02 - Melt Shop DCW Cooling Tower	5,900	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-03 - Rolling Mill ICW Cooling Tower	8,500	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0600	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-03 - Rolling Mill ICW Cooling Tower	8,500	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0400	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-03 - Rolling Mill ICW Cooling Tower	8,500	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-04 - Rolling Mill DCW Cooling Tower	22,750	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1700	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-04 - Rolling Mill DCW Cooling Tower	22,750	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1200	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-04 - Rolling Mill DCW Cooling Tower	22,750	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0004	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	90,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.7800	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	90,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.5400	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	90,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0017	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-06 - Light Plate Quench DCW Cooling Tower	8,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0600	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-06 - Light Plate Quench DCW Cooling Tower	8,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0400	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-06 - Light Plate Quench DCW Cooling Tower	8,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	LB/HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Cooling Tower
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	3,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0200	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	3,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0200	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	3,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-08 - Air Separation Plant Cooling Tower	14,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1000	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-08 - Air Separation Plant Cooling Tower	14,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0800	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-08 - Air Separation Plant Cooling Tower	14,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0002	LB/HR
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Contact Cooling Towers - Melt Shop 2 (P027)	3	MMGAL/H	i.□use of drift eliminator(s) designed to achieve a 0.001% drift rate;□ ii.□maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below:□ Cooling Tower - TDS (ppm)□ Meltshop 2 Cooling Tower - 1000□ Caster Mold Water Cooling Tower - 800□ Tunnel Furnace Cooling Tower - 800□ Caster Non-Contact 2 Cooling Tower - 800□ Caster Contact 2 Cooling Tower - 1400	PARTICULATE MATTER, FILTERABLE (FPM)	1.1700	T/YR
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Contact Cooling Towers - Melt Shop 2 (P027)	3	MMGAL/H	i.□use of drift eliminator(s) designed to achieve a 0.001% drift rate;□ ii.□maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below:□ Cooling Tower - TDS (ppm)□ Meltshop 2 Cooling Tower - 1000□ Caster Mold Water Cooling Tower - 800□ Tunnel Furnace Cooling Tower - 800□ Caster Non-Contact 2 Cooling Tower - 800□ Caster Contact 2 Cooling Tower - 1400	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.9300	T/YR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Cooling Tower
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Contact Cooling Towers (P014)	6	MMGAL/H	i. use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400	PARTICULATE MATTER, FILTERABLE (FPM)	8.7000	T/YR
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Contact Cooling Towers (P014)	6	MMGAL/H	i. use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	6.9500	T/YR
NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Contact Cooling Towers (P014)	6	MMGAL/H	i. use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0200	T/YR
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Reheat #1 Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	LB/H

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Cooling Tower
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Reheat #1 Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0025	LB/H
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Reheat #1 Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0023	LB/H
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Reheat #2 Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0032	LB/H
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Reheat #2 Cooling Tower)	0	-	Proper equipment design, operation, and maintenance	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0028	LB/H
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Reheat #2 Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	LB/H
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Rod Line Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0026	LB/H
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Rod Line Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0025	LB/H
NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Cooling Tower (Rod Line Cooling Tower)	0	-	Proper equipment design, operation, and maintenance.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	LB/H
NUCOR STEEL ARKANSAS	2/14/2019	SN-49 Cooling Tower 4	0	-	High Efficiency Drift Eliminator	PARTICULATE MATTER, FILTERABLE (FPM)	0.0005	% EFFECIENCY
NUCOR STEEL ARKANSAS	2/14/2019	SN-49 Cooling Tower 4	0	-		PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0005	% EFFECIENCY
NUCOR STEEL ARKANSAS	2/14/2019	SN-49 Cooling Tower 4	0	-	High Efficiency Drift Eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0001	% EFFECIENCY
NUCOR STEEL FLORIDA FACILITY	2/14/2019	Two Cooling Towers	19,650	gal/min	Drift eliminators	PARTICULATE MATTER, TOTAL (TPM)	0.0010	% DRIFT RATE
NUCOR STEEL KANKAKEE, INC.	11/1/2018	Cooling Towers	4,500	gallons/minute	Drift eliminators	PARTICULATE MATTER, TOTAL (TPM)	0.0010	WEIGHT PERCENT
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE (FPM)	0.6600	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.3300	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0013	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers (non-contact cooling tower)	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE (FPM)	0.1200	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers (non-contact cooling tower)	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0500	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers (non-contact cooling tower)	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0003	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers (contact cooling tower)	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE (FPM)	0.1300	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers (contact cooling tower)	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0600	LB/HR
NUCOR STEEL - BERKELEY	5/4/2018	Cooling Towers (contact cooling tower)	0	-	Proper Equipment Design, Operation and Maintenance	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0003	LB/HR
GERDAU MACSTEEL, INC.	10/27/2014	EUCASTERCOOLTWR (Caster cooling tower)	1,630	GAL/MIN	Drift eliminator	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0005	%
NUCOR STEEL TUSCALOOSA, INC.	7/22/2014	Vacuum Degasser with flare and cooling towers	0	-	With flare	PARTICULATE MATTER, FILTERABLE (FPM)	0.0080	GR/DSCF

[1] Note: AM/NS Calvert, LLC PSD Application submitted December 2020. Permit not yet issued.

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
AM/NS CALVERT, LLC	--[1]	2,700 kW and 2,000 kW Emergency Diesel Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, FILTERABLE (FPM)	0.2000	G/KW-HR
AM/NS CALVERT, LLC	--[1]	2,700 kW and 2,000 kW Emergency Diesel Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	G/KW-HR
AM/NS CALVERT, LLC	--[1]	2,700 kW and 2,000 kW Emergency Diesel Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2000	G/KW-HR
AM/NS CALVERT, LLC	--[1]	250 kW Emergency Engines	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, FILTERABLE (FPM)	0.2000	G/KW-HR
AM/NS CALVERT, LLC	--[1]	250 kW Emergency Engines	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	G/KW-HR
AM/NS CALVERT, LLC	--[1]	250 kW Emergency Engines	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2000	G/KW-HR
CRONUS CHEMICALS	12/21/2023	Emergency Generator Engine	3,985	hp		PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	G/KW-HR
CRONUS CHEMICALS	12/21/2023	Emergency Generator Engine	3,985	hp		PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2000	G/KW-HR
GEISMAR PLANT	12/12/2023	06-22 - AO-5 Emergency Generator	671	horsepower	Use of good combustion practices and compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2200	LB/HR
GEISMAR PLANT	12/12/2023	06-22 - AO-5 Emergency Generator	671	horsepower	Use of good combustion practices and compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2200	LB/HR
GEISMAR PLANT	12/12/2023	53-22 - PAO Emergency Generator	671	horsepower	Use of good combustion practices, compliance with NSPS Subpart IIII, and limiting non-emergency operation to no more than 100 hours per year	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2200	LB/HR
GEISMAR PLANT	12/12/2023	53-22 - PAO Emergency Generator	671	horsepower	Use of good combustion practices, compliance with NSPS Subpart IIII, and limiting non-emergency operation to no more than 100 hours per year	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2200	LB/HR
MAPLE CREEK ENERGY LLC	6/19/2023	Emergency generator	2,012	hp		PARTICULATE MATTER, TOTAL (TPM)	0.1500	G PER HP-HR
MAPLE CREEK ENERGY LLC	6/19/2023	Emergency generator	2,012	hp		PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G PER HP-HR
MAPLE CREEK ENERGY LLC	6/19/2023	Emergency generator	2,012	hp		PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
HYBAR LLC	4/28/2023	Emergency Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL (TPM)	0.1000	G/BHP-HR
HYBAR LLC	4/28/2023	Emergency Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1000	G/BHP-HR
HYBAR LLC	4/28/2023	Emergency Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1000	G/BHP-HR
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN1)	3,000	Horsepower	certified engine	PARTICULATE MATTER, TOTAL (TPM)	0.1500	G/HP-H
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN1)	3,000	Horsepower	certified engine	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-H
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN1)	3,000	Horsepower	certified engine	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-H
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN2)	500	Horsepower	certified engine	PARTICULATE MATTER, TOTAL (TPM)	0.1500	G/HP-H
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN2)	500	Horsepower	certified engine	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-H
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN2)	500	Horsepower	certified engine	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-H
ORANGE COUNTY ADVANCED POWER STATION	3/13/2023	EMERGENCY GENERATOR	19	MMBTU/HR	GOOD COMBUSTION PRACTICES, LIMITED TO 100 HR/YR	PARTICULATE MATTER, FILTERABLE (FPM)	0.0003	LB/HP HR
ORANGE COUNTY ADVANCED POWER STATION	3/13/2023	EMERGENCY GENERATOR	19	MMBTU/HR	GOOD COMBUSTION PRACTICES, LIMITED TO 100 HR/YR	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0003	LB/HP HR
ORANGE COUNTY ADVANCED POWER STATION	3/13/2023	EMERGENCY GENERATOR	19	MMBTU/HR	GOOD COMBUSTION PRACTICES, LIMITED TO 100 HR/YR	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0030	LB/HP HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL ARKANSAS	11/21/2022	SN-230 Galvanizing Line No, 2 Emergency Generator	3,634	Horsepower		PARTICULATE MATTER, FILTERABLE (FPM)	0.2000	G/KW-HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL ARKANSAS	11/21/2022	SN-230 Galvanizing Line No, 2 Emergency Generator	3,634	Horsepower		PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	G/KW-HR
NUCOR STEEL ARKANSAS	11/21/2022	SN-230 Galvanizing Line No, 2 Emergency Generator	3,634	Horsepower		PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2000	G/KW-HR
INTEL OHIO SITE	9/20/2022	5,051 bhp (3,768 kWm) Diesel-Fired Emergency Generators: P001 through P046	5,051	HP	Certified to meet Tier 2 standards and good combustion practices	PARTICULATE MATTER, TOTAL (TPM)	0.2000	G/KW-H
INTEL OHIO SITE	9/20/2022	5,051 bhp (3,768 kWm) Diesel-Fired Emergency Generators: P001 through P046	5,051	HP	Certified to meet Tier 2 standards and good combustion practices	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0700	LB/H
INTEL OHIO SITE	9/20/2022	5,051 bhp (3,768 kWm) Diesel-Fired Emergency Generators: P001 through P046	5,051	HP	Certified to meet Tier 2 standards and good combustion practices	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0700	LB/H
MIDWEST FERTILIZER COMPANY LLC	5/6/2022	emergency generator EU 014a	3,600	HP		PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
MIDWEST FERTILIZER COMPANY LLC	5/6/2022	emergency generator EU 014a	3,600	HP		PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
MAIDSVILLE	1/5/2022	Emergency Generator	2,100	hp	Clean Fuels and Good Combustion Practices.	PARTICULATE MATTER, TOTAL (TPM)	0.2300	LB/HR
NACERO PENWELL FACILITY	11/17/2021	Emergency Generators	0		limited to 100 hours per year of non-emergency operation. EPA Tier 2 (40 CFR Â§ 1039.101) exhaust emission standards	PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
NACERO PENWELL FACILITY	11/17/2021	Emergency Generators	0		limited to 100 hours per year of non-emergency operation. EPA Tier 2 (40 CFR Â§ 1039.101) exhaust emission standards	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0000	
NACERO PENWELL FACILITY	11/17/2021	Emergency Generators	0		limited to 100 hours per year of non-emergency operation. EPA Tier 2 (40 CFR Â§ 1039.101) exhaust emission standards	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0000	
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	VCM Unit Emergency Generator A	1,389	hp	Good combustion practices/gaseous fuel burning.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.4000	G/HP-HR
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	VCM Unit Emergency Generator A	1,389	hp	Good combustion practices/gaseous fuel burning.	PARTICULATE MATTER, TOTAL (TPM)	0.4000	G/HP-HR
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	C/A Emergency Generator B	1,800	hp	Good combustion practices/gaseous fuel burning.	PARTICULATE MATTER, TOTAL (TPM)	0.4000	G/HP-HR
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	C/A Emergency Generator B	1,800	hp	Good combustion practices/gaseous fuel burning.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.4000	G/HP-HR
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	VCM Unit Emergency Generator B	439	hp	Good combustion practices/gaseous fuel burning.	PARTICULATE MATTER, TOTAL (TPM)	0.4000	G/HP-HR
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	VCM Unit Emergency Generator B	439	hp	Good combustion practices/gaseous fuel burning.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.4000	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	New Pumphouse (XB13) Emergency Generator #1 (EP 08-05)	2,922	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	New Pumphouse (XB13) Emergency Generator #1 (EP 08-05)	2,922	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	New Pumphouse (XB13) Emergency Generator #1 (EP 08-05)	2,922	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Tunnel Furnace Emergency Generator (EP 08-06)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Tunnel Furnace Emergency Generator (EP 08-06)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL GALLATIN, LLC	4/19/2021	Tunnel Furnace Emergency Generator (EP 08-06)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Caster B Emergency Generator (EP 08-07)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Caster B Emergency Generator (EP 08-07)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Caster B Emergency Generator (EP 08-07)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Air Separation Unit Emergency Generator (EP 08-08)	700	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Air Separation Unit Emergency Generator (EP 08-08)	700	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Air Separation Unit Emergency Generator (EP 08-08)	700	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Complex Emergency Generator (EP 09-05)	350	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Complex Emergency Generator (EP 09-05)	350	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Complex Emergency Generator (EP 09-05)	350	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
DIAMOND GREEN DIESEL PORT ARTHUR FACILITY	9/16/2020	EMERGENCY GENERATOR	0		limited to 100 hours per year of non-emergency operation	PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
DIAMOND GREEN DIESEL PORT ARTHUR FACILITY	9/16/2020	EMERGENCY GENERATOR	0		limited to 100 hours per year of non-emergency operation	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0000	
DIAMOND GREEN DIESEL PORT ARTHUR FACILITY	9/16/2020	EMERGENCY GENERATOR	0		limited to 100 hours per year of non-emergency operation	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0000	
MOTIVA POLYETHYLENE MANUFACTURING COMPLEX	9/9/2020	EMERGENCY GENERATOR	0		100 HOURS OPERATIONS, Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101	PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
MOTIVA POLYETHYLENE MANUFACTURING COMPLEX	9/9/2020	EMERGENCY GENERATOR	0		100 HOURS OPERATIONS, Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0000	
MOTIVA POLYETHYLENE MANUFACTURING COMPLEX	9/9/2020	EMERGENCY GENERATOR	0		100 HOURS OPERATIONS, Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.3000	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.3000	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.3000	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	
ORANGE POLYETHYLENE PLANT	4/23/2020	EMERGENCY GENERATORS & FIRE WATER PUMP ENGINES	0		well-designed and properly maintained engines and each limited to 100 hours per year of non-emergency use.	PARTICULATE MATTER, FILTERABLE (FPM)	0.0000	
ORANGE POLYETHYLENE PLANT	4/23/2020	EMERGENCY GENERATORS & FIRE WATER PUMP ENGINES	0		well-designed and properly maintained engines and each limited to 100 hours per year of non-emergency use.	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0000	
ORANGE POLYETHYLENE PLANT	4/23/2020	EMERGENCY GENERATORS & FIRE WATER PUMP ENGINES	0		well-designed and properly maintained engines and each limited to 100 hours per year of non-emergency use.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
PORT ARTHUR ETHANE CRACKER UNIT	2/6/2020	Emergency generator	0		Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101, limited to 100 hours per year of non-emergency operation	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.0000	
PORT ARTHUR ETHANE CRACKER UNIT	2/6/2020	Emergency generator	0		Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101, limited to 100 hours per year of non-emergency operation	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0000	
FG LA COMPLEX	1/6/2020	Emergency Generator Diesel Engines	550	hp	Compliance with the limitations imposed by 40 CFR 63 Subpart IIII and operating the engine in accordance with the engine manufacturer's instructions and/or written procedures designed to maximize combustion efficiency and minimize fuel usage.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0000	
FG LA COMPLEX	1/6/2020	Emergency Generator Diesel Engines	550	hp	Compliance with the limitations imposed by 40 CFR 63 Subpart IIII and operating the engine in accordance with the engine manufacturer's instructions and/or written procedures designed to maximize combustion efficiency and minimize fuel usage.	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0000	
CARDINAL FG COMPANY	8/26/2019	P10- Diesel emergency Generator	0			PARTICULATE MATTER, TOTAL (TPM)	0.0500	G/B-HP-H
CARDINAL FG COMPANY	8/26/2019	P10- Diesel emergency Generator	0			PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0500	G/BHP-H
CARDINAL FG COMPANY	8/26/2019	P10- Diesel emergency Generator	0			PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0500	G/BHP-H
RIVERVIEW ENERGY CORPORATION	6/11/2019	Emergency generator EU-6006	2,800	HP	Tier II diesel engine	PARTICULATE MATTER, TOTAL (TPM)	0.2000	G/KWH
RIVERVIEW ENERGY CORPORATION	6/11/2019	Emergency generator EU-6006	2,800	HP	Tier II diesel engine	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	G/KWH
RIVERVIEW ENERGY CORPORATION	6/11/2019	Emergency generator EU-6006	2,800	HP	Tier II diesel engine	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2000	G/KWH
PETMIN USA INCORPORATED	2/6/2019	Emergency Generators (P005 and P006)	3,131	HP	Tier IV engine□ Good combustion practices	PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.1500	LB/H
PETMIN USA INCORPORATED	2/6/2019	Emergency Generators (P005 and P006)	3,131	HP	Tier IV engine□ Good combustion practices	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.1500	LB/H
PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	1,000 kW Emergency Generators (P008 - P010)	1,341	HP	certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII, shall employ good combustion practices per the manufacturerâ€™s operating manual	PARTICULATE MATTER, TOTAL (TPM)	0.4400	LB/H
PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	1,000 kW Emergency Generators (P008 - P010)	1,341	HP	certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII, shall employ good combustion practices per the manufacturerâ€™s operating manual	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.4400	LB/H
PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	1,000 kW Emergency Generators (P008 - P010)	1,341	HP	certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII, shall employ good combustion practices per the manufacturerâ€™s operating manual	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.4400	LB/H
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	PARTICULATE MATTER, TOTAL (TPM)	0.1700	G/KWH

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1700	G/KWH
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1700	G/KWH
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Good Combustion Practices and The Use of Ultra-low Sulfur Fuel	PARTICULATE MATTER, TOTAL (TPM)	17.0000	G/KWH
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Good Combustion Practices and The Use of Ultra-low Sulfur Fuel	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1700	G/KWH
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Good Combustion Practices and The Use of Ultra-low Sulfur Fuel	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1700	G/KWH
BENTELER STEEL TUBE FACILITY	3/28/2018	emergency generators (3 units) EQT0039, EQT0040, EQT0041	0		Comply with 40 CFR 60 Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0000	
BENTELER STEEL TUBE FACILITY	3/28/2018	emergency generators (3 units) EQT0039, EQT0040, EQT0041	0		Comply with 40 CFR 60 Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	
GULF COAST METHANOL COMPLEX	1/4/2018	emergency generators (4 units)	13,410	hp (each)		PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0000	
GULF COAST METHANOL COMPLEX	1/4/2018	emergency generators (4 units)	13,410	hp (each)		PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	
DANIA BEACH ENERGY CENTER	12/4/2017	Two 3300 kW emergency generators	0		Clean fuel	PARTICULATE MATTER, FILTERABLE (FPM)	0.2000	GRAMS PER KWH
GUERNSEY POWER STATION LLC	10/23/2017	Emergency Generators (2 identical, P004 and P005)	2,206	HP	Certified to the meet the emissions standards in 40 CFR 89.112 and 89.113 pursuant to 40 CFR 60.4205(b) and 60.4202(a)(2). □ Good combustion practices per the manufacturerâ€™s operating manual.	PARTICULATE MATTER, TOTAL (TPM)	0.7300	LB/H
GUERNSEY POWER STATION LLC	10/23/2017	Emergency Generators (2 identical, P004 and P005)	2,206	HP	Certified to the meet the emissions standards in 40 CFR 89.112 and 89.113 pursuant to 40 CFR 60.4205(b) and 60.4202(a)(2). □ Good combustion practices per the manufacturerâ€™s operating manual.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.7300	LB/H
GUERNSEY POWER STATION LLC	10/23/2017	Emergency Generators (2 identical, P004 and P005)	2,206	HP	Certified to the meet the emissions standards in 40 CFR 89.112 and 89.113 pursuant to 40 CFR 60.4205(b) and 60.4202(a)(2). □ Good combustion practices per the manufacturerâ€™s operating manual.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.7300	LB/H
OREGON ENERGY CENTER	9/27/2017	Emergency generator (P003)	1,529	HP	Ultra low sulfur diesel fuel	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.5000	LB/H
OREGON ENERGY CENTER	9/27/2017	Emergency generator (P003)	1,529	HP	Ultra low sulfur diesel fuel	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.5000	LB/H
INWOOD	9/15/2017	Emergency Generator - ESDG14	900	bhp	ULSD	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	G/HP-HR
TRUMBULL ENERGY CENTER	9/7/2017	Emergency generator (P003)	1,529	HP	Ultra low sulfur diesel fuel	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.5000	LB/H
TRUMBULL ENERGY CENTER	9/7/2017	Emergency generator (P003)	1,529	HP	Ultra low sulfur diesel fuel	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.5000	LB/H
FIRST QUALITY TISSUE LOCK HAVEN PLT	7/27/2017	Emergency Generator	2,500	bhp		PARTICULATE MATTER, TOTAL (TPM)	0.2000	G
ST. JAMES METHANOL PLANT	6/30/2017	DEG1-13 - Diesel Fired Emergency Generator Engine (EQT0012)	1,474	horsepower	Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0800	LB/HR

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
ST. JAMES METHANOL PLANT	6/30/2017	DEG1-13 - Diesel Fired Emergency Generator Engine (EQT0012)	1,474	horsepower	Compliance with NSPS Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0800	LB/HR
PALLAS NITROGEN LLC	4/19/2017	Emergency Generator (P009)	5,000	HP	good combustion control and operating practices and engines designed to meet the stands of 40 CFR Part 60, Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	LB/H
PALLAS NITROGEN LLC	4/19/2017	Emergency Generator (P009)	5,000	HP	good combustion control and operating practices and engines designed to meet the stands of 40 CFR Part 60, Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2000	LB/H
MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3,600	HP EACH	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL (TPM)	0.1500	G/HP-H EACH
MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3,600	HP EACH	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-H EACH
MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3,600	HP EACH	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-H EACH
CAMERON LNG FACILITY	2/17/2017	emergency generator engines (6 units)	3,353	hp	Complying with 40 CFR 60 Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0000	
CAMERON LNG FACILITY	2/17/2017	emergency generator engines (6 units)	3,353	hp	Complying with 40 CFR 60 Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	
METHANEX - GEISMAR METHANOL PLANT	12/22/2016	Emergency Generator Engines (4 units)	0		complying with 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0000	
METHANEX - GEISMAR METHANOL PLANT	12/22/2016	Emergency Generator Engines (4 units)	0		complying with 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0000	
FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	54	gal/hr	The permittee shall prepare and maintain for EU72, EU73, and EU74, within 90 days of startup, a good combustion and operation practices plan (GCOP) that defines, measures□ and verifies the use of operational and design practices determined as BACT for minimizing CO, VOC, PM, PM10, and PM2.5 emissions. Any revisions requested by the□ Division shall be made and the plan shall be maintained on site. The permittee shall operate according to the provisions of this plan at all times, including periods of startup, shutdown, and malfunction. The plan shall be incorporated into the plant standard operating procedures (SOP) and shall be made available for the Divisionâ€™s inspection. The plan shall include, but not be limited to:□ i. A list of combustion optimization practices and a means of verifying the practices have occurred.□ ii. A list of combustion and operation practices to be used to lower energy consumption and a means of verifying the practices have occurred.□ iii. A list of the design choices determined to be BACT and verification that designs were implemented in the final construction.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1490	G/HP-HR (EU72 &EU73)

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	54	gal/hr	The permittee shall prepare and maintain for EU72, EU73, and EU74, within 90 days of startup, a good combustion and operation practices plan (GCOP) that defines, measures□ and verifies the use of operational and design practices determined as BACT for minimizing CO, VOC, PM, PM10, and PM2.5 emissions. Any revisions requested by the□ Division shall be made and the plan shall be maintained on site. The permittee shall operate according to the provisions of this plan at all times, including periods of startup, shutdown, and malfunction. The plan shall be incorporated into the plant standard operating procedures (SOP) and shall be made available for the Divisionâ€™s inspection. The plan shall include, but not be limited to:□ i. A list of combustion optimization practices and a means of verifying the practices have occurred.□ ii. A list of combustion and operation practices to be used to lower energy consumption and a means of verifying the practices have occurred.□ iii. A list of the design choices determined to be BACT and verification that designs were implemented in the final construction.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1490	G/HP-HR (EU72 &EU73)
FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	54	gal/hr	The permittee shall prepare and maintain for EU72, EU73, and EU74, within 90 days of startup, a good combustion and operation practices plan (GCOP) that defines, measures□ and verifies the use of operational and design practices determined as BACT for minimizing CO, VOC, PM, PM10, and PM2.5 emissions. Any revisions requested by the□ Division shall be made and the plan shall be maintained on site. The permittee shall operate according to the provisions of this plan at all times, including periods of startup, shutdown, and malfunction. The plan shall be incorporated into the plant standard operating procedures (SOP) and shall be made available for the Divisionâ€™s inspection. The plan shall include, but not be limited to:□ i. A list of combustion optimization practices and a means of verifying the practices have occurred.□ ii. A list of combustion and operation practices to be used to lower energy consumption and a means of verifying the practices have occurred.□ iii. A list of the design choices determined to be BACT and verification that designs were implemented in the final construction.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1490	G/HP-HR (EU72 &EU73)
SOUTH FIELD ENERGY LLC	9/23/2016	Emergency generator (P003)	2,947	HP	State-of-the-art combustion design	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.9700	LB/H
SOUTH FIELD ENERGY LLC	9/23/2016	Emergency generator (P003)	2,947	HP	State-of-the-art combustion design	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.9700	LB/H

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0			PARTICULATE MATTER, TOTAL (TPM)	0.1500	G/BHP-HR
GREENSVILLE POWER STATION	6/17/2016	DIESEL-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Ultra Low Sulfur Diesel/Fuel (15 ppm max)	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.4000	G/KW
GREENSVILLE POWER STATION	6/17/2016	DIESEL-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Ultra Low Sulfur Diesel/Fuel (15 ppm max)	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.4000	G/KR
GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0			PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1900	G/HP-H
GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Low sulfur fuel and good combustion practices	PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0190	G/HP-H
MERCEDES BENZ VANS, LLC	4/15/2016	Emergency Generators and Fire Pump	1,500	hp	Meet emission standards of 40 CFR 60, Subpart IIII	PARTICULATE MATTER, TOTAL (TPM)	100.0000	HRS/YR
MERCEDES BENZ VANS, LLC	4/15/2016	Emergency Generators and Fire Pump	1,500	hp	Meet the standards of 40 CFR 60, Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	100.0000	HR/YR
MERCEDES BENZ VANS, LLC	4/15/2016	Emergency Generators and Fire Pump	1,500	hp	Must meet the standards of 40 CFR 60, Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	100.0000	HR/YR
PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/10/2016	Diesel Fired Emergency Generator	44	H/YR	use of ULSD a clean burning fuel, and limited hours of operation	PARTICULATE MATTER, FILTERABLE (FPM)	0.2600	LB/H
PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/10/2016	Diesel Fired Emergency Generator	44	H/YR	use of ULSD a clean burning fuel, and limited hours of operation	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2600	LB/H
PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/10/2016	Diesel Fired Emergency Generator	44	H/YR	use of ULSD a clean burning fuel, and limited hours of operation	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2600	LB/H
OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	Three 3300-kW ULSD emergency generators	0		Use of clean fuel	PARTICULATE MATTER, TOTAL (TPM)	0.2000	G / KW-HR
HOLBROOK COMPRESSOR STATION	1/22/2016	Emergency Generators No. 1 & No. 2	1,341	HP	Use of a certified engine, low sulfur diesel, and limiting non-emergency use to no more than 100 hours per year	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.4400	LB/HR
LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0			PARTICULATE MATTER, FILTERABLE (FPM)	0.0250	GM/HP-HR
LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0			PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0250	GM/HP-HR
LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0			PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0250	GM/HP-HR
MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0			PARTICULATE MATTER, TOTAL (TPM)	0.0400	G/HP-HR
MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0			PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.0400	G/HP-HR
MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0			PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.0400	G/HP-HR
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	8/25/2015	Emergency generator (P003)	2,346	HP	State-of-the-art combustion design	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.7700	LB/H
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	8/25/2015	Emergency generator (P003)	2,346	HP	State-of-the-art combustion design	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.7700	LB/H
BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2,922	hp (each)	Complying with 40 CFR 60 Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.2000	G/KW-HR
BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2,922	hp (each)	Complying with 40 CFR 60 Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.2000	G/KW-HR
MOUNDSVILLE COMBINED CYCLE POWER PLANT	11/21/2014	Emergency Generator	2,016	HP		PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.0000	
NTE OHIO, LLC	11/5/2014	Emergency generator (P002)	1,100	KW	Emergency operation only, < 500 hours/year each for maintenance checks and readiness testing designed to meet NSPS Subpart IIII	PARTICULATE MATTER, TOTAL (TPM)	0.7700	LB/H
NTE OHIO, LLC	11/5/2014	Emergency generator (P002)	1,100	KW	Emergency operation only, < 500 hours/year each for maintenance checks and readiness testing designed to meet NSPS Subpart IIII	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.7700	LB/H

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NTE OHIO, LLC	11/5/2014	Emergency generator (P002)	1,100	KW	Emergency operation only, < 500 hours/year each for maintenance checks and readiness testing designed to meet NSPS Subpart IIII	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.7700	LB/H
ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Remotely Operated Vehicle Emergency Generator	427	hp	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	PARTICULATE MATTER, TOTAL (TPM)	0.0000	
CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3,755	HP	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	PARTICULATE MATTER, FILTERABLE (FPM)	0.1000	G/KW-H
CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3,755	HP	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1000	G/KW-H
CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3,755	HP	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1000	G/KW-H
NUCOR STEEL TUSCALOOSA, INC.	7/22/2014	DIESEL FIRED EMERGENCY GENERATOR	800	HP		PARTICULATE MATTER, FILTERABLE (FPM)	0.0007	LB/HP-H
NUCOR STEEL TUSCALOOSA, INC.	7/22/2014	PROPANE FIRED EMERGENCY GENERATOR	400	KW		PARTICULATE MATTER, FILTERABLE (FPM)	0.7000	LB/1000 GAL
PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY GENERATOR	1,300	HP	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND□ EXCLUSIVE USE OF ULSD	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1700	G/HP-H
COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1,550	HP	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-H
COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1,550	HP	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1700	G/HP-H
COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1,550	HP	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1700	G/HP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/BHP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/BHP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/BHP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/B-HP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/B-HP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/B-HP-H
MAG PELLET LLC	4/24/2014	EMERGENCY GENERATORS	620	HP		PARTICULATE MATTER, FILTERABLE (FPM)	0.2000	G/KW-H
MAG PELLET LLC	4/24/2014	EMERGENCY GENERATORS	620	HP		PARTICULATE MATTER, FILTERABLE <10 (FPM10)	0.2000	G/KW-H

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
MAG PELLET LLC	4/24/2014	EMERGENCY GENERATORS	620	HP		PARTICULATE MATTER, FILTERABLE <2.5 (FPM2.5)	0.2000	G/KW-H
LAUDERDALE PLANT	4/22/2014	Four 3100 kW black start emergency generators	2	MMBtu/hr (HHV) per engine	Good combustion practice	PARTICULATE MATTER, TOTAL (TPM)	0.2000	GRAMS PER KW-HR
WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2,250	KW	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	PARTICULATE MATTER, FILTERABLE (FPM)	0.1500	G/HP-H
WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2,250	KW	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	PARTICULATE MATTER, TOTAL < 10 (TPM10)	0.1500	G/HP-H
WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2,250	KW	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	PARTICULATE MATTER, TOTAL <2.5 (TPM2.5)	0.1500	G/HP-H

[1]Note: AM/NS Calvert, LLC PSD Application submitted December 2020. Permit not yet issued.

Summary of RBLC Results for NOx Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
AM/NS CALVERT, LLC	--[1]	2,700 kW and 2,000 kW Emergency Diesel Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	6.4000	G/KW-H
AM/NS CALVERT, LLC	--[1]	250 kW Emergency Engines	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	4.0000	G/KW-H
CRONUS CHEMICALS	12/21/2023	Emergency Generator Engine	3,985	hp		6.4000	G/KW-HR
GEISMAR PLANT	12/12/2023	06-22 - AO-5 Emergency Generator	671	horsepower	Use of good combustion practices and compliance with NSPS Subpart IIII	4.2400	LB/HR
GEISMAR PLANT	12/12/2023	53-22 - PAO Emergency Generator	671	horsepower	Use of good combustion practices, compliance with NSPS Subpart IIII	4.2400	LB/HR
MAPLE CREEK ENERGY LLC	6/19/2023	Emergency generator	2,012	hp		4.8000	G/HP-HR
HYBAR LLC	4/28/2023	Emergency Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	3.9000	G/BHP-HR
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN1)	3,000	Horsepower	certified engine	4.8000	G/HP-HR
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN2)	500	Horsepower	certified engine	3.0000	G/HP-HR
INEOS OLIGOMERS CHOCOLATE BAYOU	3/14/2023	Engine Emergency Generator	0		TIER III ENGINE, OPERATIONS LIMITED TO 100 HRS/YR	3.9000	G/HP HR
NUCOR STEEL ARKANSAS	11/21/2022	SN-230 Galvanizing Line No, 2 Emergency Generator	3,634	Horsepower		5.6000	G/KW-HR
NORFOLK CRUSH, LLC	11/21/2022	Emergency Generator	620	hp		2.0000	G/HP-HR
INTEL OHIO SITE	9/20/2022	5,051 bhp (3,768 kWm) Diesel-Fired Emergency Generators: P001 through P046	5,051	HP	Certified to meet Tier 2 standards and good combustion practices	6.4000	G/KW-H
MIDWEST FERTILIZER COMPANY LLC	5/6/2022	emergency generator EU 014a	3,600	HP		4.4200	G/HP-HR
MAIDSVILLE	1/5/2022	Emergency Generator	2,100	hp	Combustion Control (retarded timing and/or lean burn)	24.6000	LB/HR
NACERO PENWELL FACILITY	11/17/2021	Emergency Generators	0		limited to 100 hours per year of non-emergency operation. EPA Tier 2 (40 CFR Â§ 1039.101) exhaust emission standards	0.0000	
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	VCM Unit Emergency Generator A	1,389	hp	Good combustion practices/gaseous fuel burning.	6.9000	G/HP-HR
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	C/A Emergency Generator B	1,800	hp	Good combustion practices/gaseous fuel burning.	6.9000	G/HP-HR
SHINTECH PLAQUEMINES PLANT 1	5/4/2021	VCM Unit Emergency Generator B	439	hp	Good combustion practices/gaseous fuel burning.	6.9000	G/HP-HR
NUCOR STEEL GALLATIN, LLC	4/19/2021	New Pumphouse (XB13) Emergency Generator #1 (EP 08-05)	2,922	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.0000	
NUCOR STEEL GALLATIN, LLC	4/19/2021	Tunnel Furnace Emergency Generator (EP 08-06)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.0000	
NUCOR STEEL GALLATIN, LLC	4/19/2021	Caster B Emergency Generator (EP 08-07)	2,937	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.0000	
NUCOR STEEL GALLATIN, LLC	4/19/2021	Air Separation Unit Emergency Generator (EP 08-08)	700	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.0000	

Summary of RBLC Results for NOx Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Complex Emergency Generator (EP 09-05)	350	HP	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.0000	

Summary of RBLC Results for NOx Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
DIAMOND GREEN DIESEL PORT ARTHUR FACILITY	9/16/2020	EMERGENCY GENERATOR	0		limited to 100 hours per year of non-emergency operation	0.0000	
MOTIVA POLYETHYLENE MANUFACTURING COMPLEX	9/9/2020	EMERGENCY GENERATOR	0		100 HOURS OPERATIONS, Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.7700	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.7700	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.9800	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.9800	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.7700	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.7700	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.9800	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.9800	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	3.5000	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.0000	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.0000	G/HP-HR
ORANGE POLYETHYLENE PLANT	4/23/2020	EMERGENCY GENERATORS & FIRE WATER PUMP ENGINES	0		well-designed and properly maintained engines and each limited to 100 hours per year of non-emergency use.	0.0000	

Summary of RBLC Results for NOx Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
PORT ARTHUR ETHANE CRACKER UNIT	2/6/2020	Emergency generator	0		Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101, limited to 100 hours per year of non-emergency operation	0.0000	
FG LA COMPLEX	1/6/2020	Emergency Generator Diesel Engines	550	hp	Compliance with the limitations imposed by 40 CFR 63 Subpart IIII and operating the engine in accordance with the engine manufacturer's instructions and/or written procedures designed to maximize combustion efficiency and minimize fuel usage.	0.0000	
RIVERVIEW ENERGY CORPORATION	6/11/2019	Emergency generator EU-6006	2,800	HP	Tier II diesel engine	6.4000	G/KWH
PETMIN USA INCORPORATED	2/6/2019	Emergency Generators (P005 and P006)	3,131	HP	Tier IV engine Tier IV NSPS standards certified by engine manufacturer.	3.4500	LB/H
PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	1,000 kW Emergency Generators (P008 - P010)	1,341	HP	certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII, shall employ good combustion practices per the manufacturerâ€™s operating manual	14.9600	LB/H
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	5.3600	G/KWH
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Good Combustion Practices, The Use of an Engine Turbocharger and Aftercooler.	5.3600	G/KWH
BENTELER STEEL TUBE FACILITY	3/28/2018	emergency generators (3 units) EQT0039, EQT0040, EQT0041	0		Comply with 40 CFR 60 Subpart IIII	0.0000	
GULF COAST METHANOL COMPLEX	1/4/2018	emergency generators (4 units)	13,410	hp (each)	Comply with standards of 40 CFR 60 Subpart JJJJ	2.0000	G/BHP-HR
GUERNSEY POWER STATION LLC	10/23/2017	Emergency Generators (2 identical, P004 and P005)	2,206	HP	Certified to the meet the emissions standards in 40 CFR 89.112 and 89.113 pursuant to 40 CFR 60.4205(b) and 60.4202(a)(2). Good combustion practices per the manufacturerâ€™s operating manual.	23.2100	LB/H
OREGON ENERGY CENTER	9/27/2017	Emergency generator (P003)	1,529	HP	State-of-the-art combustion design	16.1000	LB/H
INWOOD	9/15/2017	Emergency Generator - ESDG14	900	bhp	Engine Design	4.7700	G/HP-HR
TRUMBULL ENERGY CENTER	9/7/2017	Emergency generator (P003)	1,529	HP	State-of-the-art combustion design	16.0700	LB/H
ST. JAMES METHANOL PLANT	6/30/2017	DEG1-13 - Diesel Fired Emergency Generator Engine (EQT0012)	1,474	horsepower	Compliance with NSPS Subpart IIII	19.2300	LB/HR
PALLAS NITROGEN LLC	4/19/2017	Emergency Generator (P009)	5,000	HP	good combustion control and operating practices and engines designed to meet the stands of 40 CFR Part 60, Subpart IIII	5.5000	LB/H
MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3,600	HP EACH	GOOD COMBUSTION PRACTICES	4.4200	G/HP-H EACH
CAMERON LNG FACILITY	2/17/2017	emergency generator engines (6 units)	3,353	hp	Complying with 40 CFR 60 Subpart IIII	0.0000	
METHANEX - GEISMAR METHANOL PLANT	12/22/2016	Emergency Generator Engines (4 units)	0		complying with 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ	0.0000	
SOUTH FIELD ENERGY LLC	9/23/2016	Emergency generator (P003)	2,947	HP	State-of-the-art combustion design	27.1800	LB/H

Summary of RBLC Results for NOx Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0			4.8000	G/BHP-HR
GREENSVILLE POWER STATION	6/17/2016	DIESEL-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Good Combustion Practices/Maintenance	6.4000	G/KW
GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Good Combustion Practices/Maintenance	2.0000	G/HP-H
PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/10/2016	Diesel Fired Emergency Generator	44	H/YR	use of ultra low sulfur diesel a clean burning fuel.	42.3000	LB/H
HOLBROOK COMPRESSOR STATION	1/22/2016	Emergency Generators No. 1 & No. 2	1,341	HP	Good equipment design, proper combustion techniques, use of low sulfur fuel, and compliance with 40 CFR 60 Subpart IIII	14.1600	LB/HR
LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0			5.4500	GM/HP-HR
MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0			4.9300	G/HP-HR
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	8/25/2015	Emergency generator (P003)	2,346	HP	State-of-the-art combustion design	21.6000	LB/H
BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2,922	hp (each)	Complying with 40 CFR 60 Subpart IIII	6.4000	G/KW-HR
MOUNDSVILLE COMBINED CYCLE POWER PLANT	11/21/2014	Emergency Generator	2,016	HP		0.0000	
NTE OHIO, LLC	11/5/2014	Emergency generator (P002)	1,100	KW	Emergency operation only, < 500 hours/year each for maintenance checks and readiness testing designed to meet NSPS Subpart IIII	29.0100	LB/H
ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Remotely Operated Vehicle Emergency Generator	427	hp	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.0000	
CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3,755	HP	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.6700	G/KW-H
NUCOR STEEL TUSCALOOSA, INC.	7/22/2014	DIESEL FIRED EMERGENCY GENERATOR	800	HP		0.0150	LB/HP-H
NUCOR STEEL TUSCALOOSA, INC.	7/22/2014	PROPANE FIRED EMERGENCY GENERATOR	400	KW		13.0000	LB/1000 GAL
PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY GENERATOR	1,300	HP	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	4.8000	G/HP-H
COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1,550	HP	GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMIT	4.8000	G/HP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	4.4600	G/BHP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	4.4600	G/B-HP-H
WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2,250	KW	LIMITED OPERATING HOURS, USE OF ULTRA- LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	4.8000	G/HP-H

(1)Note: AM/NS Calvert, LLC PSD Application submitted December 2020. Permit not yet issued.

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

VOC Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
AM/NS CALVERT, LLC	--[(1)]	2,700 kW and 2,000 kW Emergency Diesel Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	6.4000	G/KW-H
AM/NS CALVERT, LLC	--[(1)]	250 kW Emergency Engines	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	4.0000	G/KW-H
CRONUS CHEMICALS	12/21/2023	Emergency Generator Engine	3,985	hp		6.4000	G/KW-HR
GEISMAR PLANT	12/12/2023	06-22 - AO-5 Emergency Generator	671	horsepower	Use of good combustion practices and compliance with NSPS Subpart IIII	0.1100	LB/HR
GEISMAR PLANT	12/12/2023	53-22 - PAO Emergency Generator	671	horsepower	Use of good combustion practices, compliance with NSPS Subpart IIII	0.1100	LB/HR
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN1)	3,000	Horsepower	certified engine	0.3200	G/HP-HR
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN2)	500	Horsepower	certified engine	1.1300	G/HP-HR
INEOS OLIGOMERS CHOCOLATE BAYOU	3/14/2023	Engine Emergency Generator	0		TIER III	0.0000	
ORANGE COUNTY ADVANCED POWER STATION	3/13/2023	EMERGENCY GENERATOR	19	MMBTU/HR	GOOD COMBUSTION PRACTICES, LIMITED TO 100 HR/YR	0.0010	LB/HP HR
NUCOR STEEL ARKANSAS	11/21/2022	SN-230 Galvanizing Line No, 2 Emergency Generator	3,634	Horsepower		0.8000	G/KW-HR
NORFOLK CRUSH, LLC	11/21/2022	Emergency Generator	620	hp		1.0000	G/HP-HR
INTEL OHIO SITE	9/20/2022	5,051 bhp (3,768 kWm) Diesel-Fired Emergency Generators: P001 through P046	5,051	HP	Certified to meet Tier 2 standards and good combustion practices	0.4000	G/KW-H
DERIDDER SAWMILL	5/10/2022	GEN-1 - Emergency Generator No. 1	750	horsepower	Good combustion practices and maintenance and compliance with applicable 40 CFR 60 Subpart JJJJ limitation for VOC.	1.9800	LB/HR
DERIDDER SAWMILL	5/10/2022	GEN-2 - Emergency Generator No. 2	750	horsepower	Good combustion practices and maintenance and compliance with applicable 40 CFR 60 Subpart JJJJ limitation for VOC	1.9800	LB/HR
DERIDDER SAWMILL	5/10/2022	GEN-3 - Emergency Generator No. 2	750	horsepower	Good Combustion practices and maintenance and compliance with applicable 40 CFR 60 Subpart JJJJ limitations for VOC	1.9800	LB/HR
MIDWEST FERTILIZER COMPANY LLC	5/6/2022	emergency generator EU 014a	3,600	HP		0.3500	G/HP-HR
MAIDSVILLE	1/5/2022	Emergency Generator	2,100	hp	Good Combustion Practices w/ OxCat. Applicant did not justify why an oxcat is infeasible for an emergency engine	0.4600	LB/HR
NACERO PENWELL FACILITY	11/17/2021	Emergency Generators	0		limited to 100 hours per year of non-emergency operation. EPA Tier 2 (40 CFR Â§ 1039.101) exhaust emission standards	0.0000	
DIAMOND GREEN DIESEL PORT ARTHUR FACILITY	9/16/2020	EMERGENCY GENERATOR	0		limited to 100 hours per year of non-emergency operation	0.0000	
MOTIVA POLYETHYLENE MANUFACTURING COMPLEX	9/9/2020	EMERGENCY GENERATOR	0		100 HOURS OPERATIONS, Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

VOC Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	1.0000	G/HP-HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	1.0000	G/HP-HR
ORANGE POLYETHYLENE PLANT	4/23/2020	EMERGENCY GENERATORS & FIRE WATER PUMP ENGINES	0		well-designed and properly maintained engines and each limited to 100 hours per year of non-emergency use.	0.0000	
PORT ARTHUR ETHANE CRACKER UNIT	2/6/2020	Emergency generator	0		Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101, limited to 100 hours per year of non-emergency operation	0.0000	
FG LA COMPLEX	1/6/2020	Emergency Generator Diesel Engines	550	hp	Compliance with the limitations imposed by 40 CFR 63 Subpart IIII and operating the engine in accordance with the engine manufacturer's instructions and/or written procedures designed to maximize combustion efficiency and minimize fuel usage.	0.0000	
GREEN BAY PACKAGING- MILL DIVISION	12/10/2019	Natural Gas-Fired Emergency Generator (P37)	230	HP	Only fire natural gas	200.0000	H/Y
GREEN BAY PACKAGING- MILL DIVISION	12/10/2019	Natural Gas-Fired Emergency Generator (P38)	375	HP	Only fire natural gas.	200.0000	H/Y
GREEN BAY PACKAGING- MILL DIVISION	12/10/2019	Natural Gas-fired Emergency Generator (P39)	675	HP	Only fire natural gas.	200.0000	H/Y

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

VOC Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
CONDENSATE SPLITTER FACILITY	10/31/2019	Emergency Generators	0		Limiting duration and frequency of generator use to 100 hr/yr. Good combustion practices will be used to reduce VOC including maintaining proper air-to-fuel ratio.	0.1200	G/KW HR
RIVERVIEW ENERGY CORPORATION	6/11/2019	Emergency generator EU-6006	2,800	HP	Tier II diesel engine	6.4000	G/KWH
PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	1,000 kW Emergency Generators (P008 - P010)	1,341	HP	certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII, shall employ good combustion practices per the manufacturerâ€™s operating manual	14.9600	LB/H
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		Good Combustion Practices	0.5600	G/KWH
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Good Combustion Practices	0.5600	G/KWH
BENTELER STEEL TUBE FACILITY	3/28/2018	emergency generators (3 units) EQT0039, EQT0040, EQT0041	0		Comply with 40 CFR 60 Subpart IIII	0.0000	
GULF COAST METHANOL COMPLEX	1/4/2018	emergency generators (4 units)	13,410	hp (each)	Comply with standards of 40 CFR 60 Subpart JJJJ	1.0000	G/BHP-HR
GUERNSEY POWER STATION LLC	10/23/2017	Emergency Generators (2 identical, P004 and P005)	2,206	HP	Certified to the meet the emissions standards in 40 CFR 89.112 and 89.113 pursuant to 40 CFR 60.4205(b) and 60.4202(a)(2). Good combustion practices per the manufacturerâ€™s operating manual.	23.2100	LB/H
OREGON ENERGY CENTER	9/27/2017	Emergency generator (P003)	1,529	HP	State-of-the-art combustion design	2.0000	LB/H
TRUMBULL ENERGY CENTER	9/7/2017	Emergency generator (P003)	1,529	HP	State-of-the-art combustion design	2.0000	LB/H
FIRST QUALITY TISSUE LOCK HAVEN PLT	7/27/2017	Emergency Generator	2,500	bhp		3.5000	G
PERDUE GRAIN AND OILSEED, LLC	7/12/2017	Emergency Generator	0			0.4900	LB/HR
ST. JAMES METHANOL PLANT	6/30/2017	DEG1-13 - Diesel Fired Emergency Generator Engine (EQT0012)	1,474	horsepower	Compliance with NSPS Subpart IIII	0.0400	LB/HR
PALLAS NITROGEN LLC	4/19/2017	Emergency Generator (P009)	5,000	HP	good combustion control and operating practices and engines designed to meet the stands of 40 CFR Part 60, Subpart IIII	1.6000	LB/H
MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3,600	HP EACH	GOOD COMBUSTION PRACTICES	0.3500	G/HP-H EACH
CAMERON LNG FACILITY	2/17/2017	emergency generator engines (6 units)	3,353	hp	Complying with 40 CFR 60 Subpart IIII	0.0000	
BATON ROUGE JUNCTION FACILITY	12/15/2016	Emergency Generators (2 units)	0		Comply with standards of NSPS Subpart JJJJ	0.0000	

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

VOC Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	54	gal/hr	The permittee shall prepare and maintain for EU72, EU73, and EU74, within 90 days of startup, a good combustion and operation practices plan (GCOP) that defines, measures and verifies the use of operational and design practices determined as BACT for minimizing CO, VOC, PM, PM10, and PM2.5 emissions. Any revisions requested by the Division shall be made and the plan shall be maintained on site. The permittee shall operate according to the provisions of this plan at all times, including periods of startup, shutdown, and malfunction. The plan shall be incorporated into the plant standard operating procedures (SOP) and shall be made available for the Divisionâ€™s inspection. The plan shall include, but not be limited to: i. A list of combustion optimization practices and a means of verifying the practices have occurred. ii. A list of combustion and operation practices to be used to lower energy consumption and a means of verifying the practices have occurred. iii. A list of the design choices determined to be BACT and verification that designs were implemented in the final construction.	4.7700	G/HP-HR (EU72 &EU73)
SOUTH FIELD ENERGY LLC	9/23/2016	Emergency generator (P003)	2,947	HP	State-of-the-art combustion design	3.8400	LB/H
GREENSVILLE POWER STATION	6/17/2016	DIESEL-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Good Combustion Practices/Maintenance	6.4000	G/KW
GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Good combustion practices	1.0000	G/HP-H
MERCEDES BENZ VANS, LLC	4/15/2016	Emergency Generators and Fire Pump	1,500	hp	Must meet the standards of 40 CFR 60, Subpart IIII	100.0000	HR/YR
PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/10/2016	Diesel Fired Emergency Generator	44	H/YR	use of ULSD a clean burning fuel, and limited hours of operation	1.0000	LB/H
HOLBROOK COMPRESSOR STATION	1/22/2016	Emergency Generators No. 1 & No. 2	1,341	HP	Good combustion practices consistent with the manufacturer's recommendations to maximize fuel efficiency and minimize emissions	0.8300	LB/HR
LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0			0.2200	GM/HP-HR
MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0			0.0200	G/HP-HR
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	8/25/2015	Emergency generator (P003)	2,346	HP		3.1000	LB/H
BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2,922	hp (each)	Complying with 40 CFR 60 Subpart IIII	0.0000	
MOUNDSVILLE COMBINED CYCLE POWER PLANT	11/21/2014	Emergency Generator	2,016	HP		1.2400	LB/H

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

VOC Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Remotely Operated Vehicle Emergency Generator	427	hp	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.0000	
CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3,755	HP	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.4000	G/KW-H
COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1,550	HP	USE ONLY ULSD, GOOD COMBUSTION PRACTICES, AND DESIGNED TO ACHIEVE EMISSION LIMIT	4.8000	G/HP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	0.3100	G/BHP-H
MIDWEST FERTILIZER CORPORATION	6/4/2014	DIESEL FIRED EMERGENCY GENERATOR	3,600	BHP	GOOD COMBUSTION PRACTICES	0.3100	G/B-HP-H

[1]Note: AM/NS Calvert, LLC PSD Application submitted December 2020. Permit not yet issued.

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
AM/NS CALVERT, LLC	--[1]	2,700 kW and 2,000 kW Emergency Diesel Generators	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	74.2100	kg/MMBtu
AM/NS CALVERT, LLC	--[1]	250 kW Emergency Engines	0		Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	74.2100	kg/MMBtu
CRONUS CHEMICALS	12/21/2023	Emergency Generator Engine	3,985	hp		160.0000	TONS/YEAR
GEISMAR PLANT	12/12/2023	06-22 - AO-5 Emergency Generator	671	horsepower	Use of good combustion practices and compliance with NSPS Subpart IIII	0.0000	
GEISMAR PLANT	12/12/2023	53-22 - PAO Emergency Generator	671	horsepower	Use of good combustion practices, compliance with NSPS Subpart IIII	0.0000	
MAPLE CREEK ENERGY LLC	6/19/2023	Emergency generator	2,012	hp		625.0000	TONS PER YEAR
HYBAR LLC	4/28/2023	Emergency Generators	0		Good combustion practices	164.0000	LB/MMBTU
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN1)	3,000	Horsepower	Good engineering design and manufacturerâ€™s recommended operating and maintenance procedures.	163.6000	LB/MMBTU
NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN2)	500	Horsepower	Good engineering design and manufacturerâ€™s recommended operating and maintenance procedures.	163.6000	LB/MMBTU
ORANGE COUNTY ADVANCED POWER STATION	3/13/2023	EMERGENCY GENERATOR	19	MMBTU/HR	GOOD COMBUSTION PRACTICES, LIMITED TO 100 HR/YR	0.0000	
NUCOR STEEL ARKANSAS	11/21/2022	SN-230 Galvanizing Line No, 2 Emergency Generator	3,634	Horsepower		163.0000	LB/MMBTU
MIDWEST FERTILIZER COMPANY LLC	5/6/2022	emergency generator EU 014a	3,600	HP		1044.0000	TON/YR
NACERO PENWELL FACILITY	11/17/2021	Emergency Generators	0		limited to 100 hours per year of non-emergency operation. EPA Tier 2 (40 CFR Â§ 1039.101) exhaust emission standards	0.0000	
DIAMOND GREEN DIESEL PORT ARTHUR FACILITY	9/16/2020	EMERGENCY GENERATOR	0		limited to 100 hours per year of non-emergency operation	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2,922	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.0000	
ORANGE POLYETHYLENE PLANT	4/23/2020	EMERGENCY GENERATORS & FIRE WATER PUMP ENGINES	0		well-designed and properly maintained engines and each limited to 100 hours per year of non-emergency use.	0.0000	
PORT ARTHUR ETHANE CRACKER UNIT	2/6/2020	Emergency generator	0		Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101, limited to 100 hours per year of non-emergency operation	0.0000	
FG LA COMPLEX	1/6/2020	Emergency Generator Diesel Engines	550	hp	Compliance with the limitations imposed by 40 CFR 63 Subpart IIII and operating the engine in accordance with the engine manufacturer's instructions and/or written procedures designed to maximize combustion efficiency and minimize fuel usage.	0.0000	
GREEN BAY PACKAGING- MILL DIVISION	12/10/2019	Natural Gas-Fired Emergency Generator (P37)	230	HP		200.0000	H/Y
GREEN BAY PACKAGING- MILL DIVISION	12/10/2019	Natural Gas-Fired Emergency Generator (P38)	375	HP	Only fire natural gas.	200.0000	H/Y
GREEN BAY PACKAGING- MILL DIVISION	12/10/2019	Natural Gas-fired Emergency Generator (P39)	675	HP	Only fire natural gas.	200.0000	H/Y
CONDENSATE SPLITTER FACILITY	10/31/2019	Emergency Generators	0		Limiting duration and frequency of generator use to 100 hr/yr. Good combustion practices will be used to reduce VOC including maintaining proper air-to-fuel ratio.	0.0000	
RIVERVIEW ENERGY CORPORATION	6/11/2019	Emergency generator EU-6006	2,800	HP	Tier II diesel engine	811.0000	TONS
PETMIN USA INCORPORATED	2/6/2019	Emergency Generators (P005 and P006)	3,131	HP	Tier IV engine Good combustion practices	3632.0000	LB/H
PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	1,000 kW Emergency Generators (P008 - P010)	1,341	HP	good operating practices (proper maintenance and operation)	80.0000	T/YR
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	0.0000	
SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Good Combustion Practices and The Use of Ultra-low Sulfur Fuel	0.0000	
GUERNSEY POWER STATION LLC	10/23/2017	Emergency Generators (2 identical, P004 and P005)	2,206	HP	good operating practices (proper maintenance and operation)	120.0000	T/YR
OREGON ENERGY CENTER	9/27/2017	Emergency generator (P003)	1,529	HP	state of the art combustion design	445.0000	T/YR

Summary of RBLC Results for VOC Emissions from Emergency Generator
Process Type: 17.110 - Large Internal Combustion Engines (>500 HP) – Fuel Oil

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
TRUMBULL ENERGY CENTER	9/7/2017	Emergency generator (P003)	1,529	HP	Efficient design	445.0000	T/YR
ST. JAMES METHANOL PLANT	6/30/2017	DEG1-13 - Diesel Fired Emergency Generator Engine (EQT0012)	1,474	horsepower	Compliance with NSPS Subpart IIII	84.0000	TPY
PALLAS NITROGEN LLC	4/19/2017	Emergency Generator (P009)	5,000	HP	good combustion control and operating practices and engines designed to meet the stands of 40 CFR Part 60, Subpart IIII	1289.0000	T/YR
CAMERON LNG FACILITY	2/17/2017	emergency generator engines (6 units)	3,353	hp	good combustion practices	0.0000	
METHANEX - GEISMAR METHANOL PLANT	12/22/2016	Emergency Generator Engines (4 units)	0		complying with 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ	0.0000	
SOUTH FIELD ENERGY LLC	9/23/2016	Emergency generator (P003)	2,947	HP	Efficient design	858.0000	T/YR
GREENSVILLE POWER STATION	6/17/2016	DIESEL-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Good Combustion Practices/Maintenance	163.6000	LB/MMBTU
GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Good Combustion Practices/Maintenance	136.1000	LB/MMBTU
HOLBROOK COMPRESSOR STATION	1/22/2016	Emergency Generators No. 1 & No. 2	1,341	HP		77.0000	TPY
LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0			81.0000	TONS
MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0			44.0000	TPY
CLEAN ENERGY FUTURE - LORDSTOWN, LLC	8/25/2015	Emergency generator (P003)	2,346	HP	Efficient design	683.0000	T/YR
BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2,922	hp (each)		0.0000	
MOUNDSVILLE COMBINED CYCLE POWER PLANT	11/21/2014	Emergency Generator	2,016	HP		2416.0000	LB/H
NTE OHIO, LLC	11/5/2014	Emergency generator (P002)	1,100	KW	Emergency operation only, < 500 hours/year each for maintenance checks and readiness testing designed to meet NSPS Subpart IIII	474.0000	T/YR
CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3,755	HP	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	432.0000	TPY
MAG PELLET LLC	4/24/2014	EMERGENCY GENERATORS	620	HP	State-of-the-art combustion design	500.0000	H

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Ovens
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL	3/30/2023	Sheet Metal Coating Line with Ovens and RTO	74	tons per hour	good combustion practices	Particulate matter, total (TPM)	0.0090	LB/MMBTU
NUCOR STEEL	3/30/2023	Sheet Metal Coating Line with Ovens and RTO	74	tons per hour	good combustion practices and use of pipeline quality natural gas	Particulate matter, total (TPM10)	0.0090	LB/MMBTU
NUCOR STEEL	3/30/2023	Sheet Metal Coating Line with Ovens and RTO	74	tons per hour	good combustion practices and use of pipeline quality natural gas	Particulate matter, total (TPM2.5)	0.0090	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Coil Coating Line Dryers and Ovens	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, filterable (FPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Coil Coating Line Dryers and Ovens	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Coil Coating Line Dryers and Ovens	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Chemical Dryer, Primer Oven, and Finish Oven	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Chemical Dryer, Primer Oven, and Finish Oven	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Chemical Dryer, Primer Oven, and Finish Oven	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Finish Oven	12	MMBtu/hr	Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM)	0.0090	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Finish Oven	12	MMBtu/hr	Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM10)	0.0090	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Finish Oven	12	MMBtu/hr	Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM2.5)	0.0090	LB/MMBTU
SDSW STEEL MILL	1/17/2020	CURING OVENS	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	Particulate matter, total (TPM)	0.0075	LB/MMBTU
SDSW STEEL MILL	1/17/2020	CURING OVENS	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
SDSW STEEL MILL	1/17/2020	CURING OVENS	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU

Summary of RBLC Results for NOx Emissions from Ovens
Process Type: 81.290 - Other Steel Manufacturing Processes

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
NUCOR STEEL	3/30/2023	Sheet Metal Coating Line with Ovens and RTO	74	tons per hour	low NOx burners and good combustion practices	20.0000	POUNDS PER HOUR
BIG RIVER STEEL LLC	1/31/2022	Coil Coating Line Dryers and Ovens	0		Good combustion practices Energy efficient burners Combustion of natural gas	0.1000	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Chemical Dryer, Primer Oven, and Finish Oven	0		Good combustion practices Energy efficient burners Combustion of natural gas	0.0500	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Finish Oven	12	MMBtu/hr	Good combustion practices Energy efficient burners Combustion of natural gas	0.2500	LB/MMBTU
SDSW STEEL MILL	1/17/2020	CURING OVENS	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	0.1000	LB/MMBTU

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Ovens
Process Type: 81.290 - Other Steel Manufacturing Processes

VOC Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
NUCOR STEEL	3/30/2023	Sheet Metal Coating Line with Ovens and RTO	74	tons per hour	recuperative thermal oxidizer (RTO)	4.0000	POUNDS PER HOUR
STEEL MILL	2/1/2022	Surface Coating Primer Oven	1,752,000	MMBTU/YR	Use of good combustion practices. Emissions from drying paint are sent to a RTO	0.0000	
BIG RIVER STEEL LLC	1/31/2022	Coil Coating Line Dryers and Ovens	0		Good combustion practices Energy efficient burners Combustion of natural gas	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Chemical Dryer, Primer Oven, and Finish Oven	0		Good combustion practices Energy efficient burners Combustion of natural gas	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	3/17/2021	Coil Coating Line - Finish Oven	12	MMBtu/hr	Good combustion practices Energy efficient burners Combustion of natural gas	0.0054	LB/MMBTU
SDSW STEEL MILL	1/17/2020	CURING OVENS	0		RECUPERATIVE THERMAL OXIDIZER	0.0000	

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Ovens
Process Type: 81.290 - Other Steel Manufacturing Processes

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
NUCOR STEEL	3/30/2023	Sheet Metal Coating Line with Ovens and RTO	74	tons per hour	good combustion practices and only pipeline quality natural gas fuel shall be combusted	117.1000	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Coil Coating Line Dryers and Ovens	0		Good operating practices	117.0000	LB/MMBTU
SDSW STEEL MILL	1/17/2020	CURING OVENS	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	117.1000	LB/MMBTU

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Boiler
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
EXPLORATORY VENTURES LLC	3/5/2024	Continuous Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Continuous Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Continuous Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	AHSS Continuous Galvanizing Line Boilers	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	AHSS Continuous Galvanizing Line Boilers	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	AHSS Continuous Galvanizing Line Boilers	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Pickle Galvanizing Line Boiler	54	lb/MMBtu	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Pickle Galvanizing Line Boiler	54	lb/MMBtu	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Pickle Galvanizing Line Boiler	54	lb/MMBtu	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Annealing Pickling Line Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Annealing Pickling Line Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Annealing Pickling Line Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Color Coating Line Boiler	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Color Coating Line Boiler	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Color Coating Line Boiler	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler NGO Line	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler NGO Line	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler NGO Line	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM10)	0.0000	
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler	0		Good combustion practices Energy efficient burners Combustion of natural gas	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	RH Degasser Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM)	0.0075	LB/MMBTU

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Boiler
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
BIG RIVER STEEL LLC	2/8/2024	RH Degasser Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	RH Degasser Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Pickle Line Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Pickle Line Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Pickle Line Boiler	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Galvanizing Line Boilers	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Galvanizing Line Boilers	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Galvanizing Line Boilers	0		Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
NUCOR STEEL	3/30/2023	Boiler (CC-BOIL)	50	MMBtu/hr	good combustion practices and only pipeline quality natural gas fuel shall be combusted	Particulate matter, filterable (FPM)	0.0007	LB/MMBTU
NUCOR STEEL	3/30/2023	Boiler (CC-BOIL)	50	MMBtu/hr	good combustion practices and only pipeline quality natural gas fuel shall be combusted	Particulate matter, total (TPM10)	0.0007	LB/MMBTU
NUCOR STEEL	3/30/2023	Boiler (CC-BOIL)	50	MMBtu/hr	good combustion practices and only pipeline quality natural gas fuel shall be combusted	Particulate matter, total (TPM2.5)	0.0007	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, filterable (FPM)	0.0019	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0019	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0019	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Boilers #1 and #2	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, filterable (FPM)	0.0007	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Boilers #1 and #2	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0007	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Boilers #1 and #2	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0007	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, filterable (FPM)	0.0012	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM10)	0.0012	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0012	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-202, 203, 204 Pickle Line Boilers	0		Good Combustion Practice	Particulate matter, filterable (FPM)	0.0019	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-202, 203, 204 Pickle Line Boilers	0		Good Combustion Practice	Particulate matter, total (TPM10)	0.0076	GR/DSCF

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Boiler
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL ARKANSAS	9/1/2021	SN-202, 203, 204 Pickle Line Boilers	0		Good Combustion Practice	Particulate matter, total (TPM2.5)	0.0076	GR/DSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Vacuum Degasser Boiler (EP 20-13)	50	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	Particulate matter, filterable (FPM)	1.9000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Vacuum Degasser Boiler (EP 20-13)	50	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	Particulate matter, total (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Vacuum Degasser Boiler (EP 20-13)	50	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	Particulate matter, total (TPM2.5)	7.6000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickle Line #2 â€“ Boiler #1 & #2 (EP 21-04 & EP 21-05)	18	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	Particulate matter, total (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickle Line #2 â€“ Boiler #1 & #2 (EP 21-04 & EP 21-05)	18	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	Particulate matter, total (TPM2.5)	7.6000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickle Line #2 â€“ Boiler #1 & #2 (EP 21-04 & EP 21-05)	18	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	Particulate matter, filterable (FPM)	1.9000	LB/MMSCF
SDSW STEEL MILL	1/17/2020	Pickling Line Boilers	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	Particulate matter, total (TPM)	0.0075	LB/MMBTU
SDSW STEEL MILL	1/17/2020	Pickling Line Boilers	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	Particulate matter, total (TPM10)	0.0075	LB/MMBTU
SDSW STEEL MILL	1/17/2020	Pickling Line Boilers	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	Particulate matter, total (TPM2.5)	0.0075	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-142 Vacuum Degasser Boiler	50	MMBTU/hr	Good combustion practices	Particulate matter, filterable (FPM)	0.0019	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-142 Vacuum Degasser Boiler	50	MMBTU/hr	Good combustion practices	Particulate matter, total (TPM10)	0.0076	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-142 Vacuum Degasser Boiler	50	MMBTU/hr	Good combustion practices	Particulate matter, total (TPM2.5)	0.0076	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-233 Galvanizing Line Boilers	15	MMBTU/hr each	Good combustion practices	Particulate matter, filterable (FPM)	0.0019	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-233 Galvanizing Line Boilers	15	MMBTU/hr each	Good combustion practices	Particulate matter, total (TPM10)	0.0076	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-233 Galvanizing Line Boilers	15	MMBTU/hr each	Good combustion practices	Particulate matter, total (TPM2.5)	0.0076	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, VACUUM DEGASSER	89	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, filterable (FPM)	9.3800	X10^-4 LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, VACUUM DEGASSER	89	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, filterable (FPM10)	9.3800	X10^-4 LB/MMBTU

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Boiler
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
BIG RIVER STEEL LLC	11/7/2018	BOILER, VACUUM DEGASSER	89	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, total (TPM2.5)	9.3800	X10^-4 LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, PICKLE LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, filterable (FPM)	0.0019	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, PICKLE LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, total (TPM10)	0.0019	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, PICKLE LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, total (TPM2.5)	0.0019	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER SN-26, GALVANIZING LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, filterable (FPM)	6.8000	X10^-4 LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER SN-26, GALVANIZING LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, total (TPM10)	6.8000	X10^-4 LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER SN-26, GALVANIZING LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	Particulate matter, total (TPM2.5)	6.8000	X10^-4 LB/MMBTU
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3 boilers)	0		Good combustion practices	Particulate matter, filterable (FPM)	1.9000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3 boilers)	0		Good Combustion Practices	Particulate matter, total (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3 boilers)	0		Good Combustion Practices	Particulate matter, total (TPM2.5)	7.6000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Vacuum Tank Degasser Equipment (vacuum degasser boiler 2)	0		Good combustion practices	Particulate matter, filterable (FPM)	1.9000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Vacuum Tank Degasser Equipment (vacuum degasser boiler 2)	0		Good combustion practices	Particulate matter, total (TPM10)	7.6000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Vacuum Tank Degasser Equipment (vacuum degasser boiler 2)	0		Good combustion practices	Particulate matter, total (TPM2.5)	7.6000	LB/MMSCF

Summary of RBLC Results for NOx Emissions from Boiler
Process Type: 81.290 - Other Steel Manufacturing Processes

<u>NOx Emission Limit</u>

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
EXPLORATORY VENTURES LLC	3/5/2024	Continuous Pickle Line Boiler	54	MMBtu/hr	Low NOx burners□ Combustion of clean fuel□ Good Combustion Practices	0.0350	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	AHSS Continuous Galvanizing Line Boilers	54	MMBtu/hr	Low NOx burners□ Combustion of clean fuel□ Good Combustion Practices	0.0350	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Pickle Galvanizing Line Boiler	54	lb/MMBtu	Low NOx burners□ Combustion of clean fuel□ Good Combustion Practices	0.0350	
BIG RIVER STEEL LLC	2/8/2024	Color Coating Line Boiler	0		Good combustion practices□ Energy efficient burners□ Combustion of natural gas	0.0350	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler NGO Line	0		Good combustion practices□ Energy efficient burners□ Combustion of natural gas	0.0350	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler	0		Good combustion practices□ Energy efficient burners□ Combustion of natural gas	0.0350	LB/MMBTU
NUCOR STEEL	3/30/2023	Boiler (CC-BOIL)	50	MMBtu/hr	low NOx burners	0.0350	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Line Boiler	54	MMBtu/hr	Low NOx burners□ Combustion of clean fuel□ Good Combustion Practices	0.0350	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Boilers #1 and #2	54	MMBtu/hr	Low NOx burners□ Combustion of clean fuel□ Good Combustion Practices	0.0350	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Boiler	54	MMBtu/hr	Low NOx burners□ Combustion of clean fuel□ Good Combustion Practices	0.0350	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-202, 203, 204 Pickle Line Boilers	0		Low NOx burners	0.0350	LB/MMBTU
NUCOR STEEL GALLATIN, LLC	4/19/2021	Vacuum Degasser Boiler (EP 20-13)	50	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan. Also equipped with low-NOx burners.	35.0000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickle Line #2 â€“ Boiler #1 & #2 (EP 21-04 & EP 21-05)	18	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan. Equipped with low-NOx burners.	50.0000	LB/MMSCF
SDSW STEEL MILL	1/17/2020	Pickling Line Boilers	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	0.0490	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-142 Vacuum Degasser Boiler	50	MMBTU/hr	Low Nox Burners	0.0350	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-233 Galvanizing Line Boilers	15	MMBTU/hr each	Low Nox Burners	0.1000	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, VACUUM DEGASSER	89	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE LOW NOX BURNERS	0.0350	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, PICKLE LINE	54	MMBTU/HR	LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.0350	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER SN-26, GALVANIZING LINE	54	MMBTU/HR	LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.0350	LB/MMBTU
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3 boilers)	0		Use of Low NOX Burners and Good Combustion Practices	50.0000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Vacuum Tank Degasser Equipment (vacuum degasser boiler 2)	0		Use of Low NOX Burners and Good Combustion Practices	0.6000	LB/MMSCF

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Boiler
Process Type: 81.290 - Other Steel Manufacturing Processes

<u>**VOC Emission Limit**</u>

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	VOC EMISSION LIMIT	VOC EMISSION LIMIT UNITS
EXPLORATORY VENTURES LLC	3/5/2024	Continuous Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	AHSS Continuous Galvanizing Line Boilers	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Pickle Galvanizing Line Boiler	54	lb/MMBtu	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
NUCOR STEEL	3/30/2023	Boiler (CC-BOIL)	50	MMBtu/hr	good combustion practices and natural gas fuel (clean fuel)	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Boilers #1 and #2	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Boiler	54	MMBtu/hr	Combustion of Natural gas and Good Combustion Practice	0.0054	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-202, 203, 204 Pickle Line Boilers	0		Good Combustion Practice	0.0055	LB/MMBTU
NUCOR STEEL GALLATIN, LLC	4/19/2021	Vacuum Degasser Boiler (EP 20-13)	50	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	5.5000	LB/MMSCF
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickle Line #2 â€" Boiler #1 & #2 (EP 21-04 & EP 21-05)	18	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	5.5000	LB/MMSCF
SDSW STEEL MILL	1/17/2020	Pickling Line Boilers	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	0.0054	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-142 Vacuum Degasser Boiler	50	MMBTU/hr	Good combustion practices	0.0026	LB/HR
NUCOR STEEL ARKANSAS	2/14/2019	SN-233 Galvanizing Line Boilers	15	MMBTU/hr each	Good combustion practices	0.0055	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, VACUUM DEGASSER	89	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER, PICKLE LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0054	LB/MMBTU
BIG RIVER STEEL LLC	11/7/2018	BOILER SN-26, GALVANIZING LINE	54	MMBTU/HR	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0540	LB/MMBTU
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3 boilers)	0		Good combustion practices	5.5000	LB/MMSCF
NUCOR STEEL - BERKELEY	5/4/2018	Vacuum Tank Degasser Equipment (vacuum degasser boiler 2)	0		Good combustion practices	2.6000	LB/MMSCF

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Boiler
Process Type: 81.290 - Other Steel Manufacturing Processes

GHG Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	GHG EMISSION LIMIT	GHG EMISSION LIMIT UNITS
EXPLORATORY VENTURES LLC	3/5/2024	Continuous Pickle Line Boiler	54	MMBtu/hr	Good operating practices□ □ Boiler □ Efficiency	117.0000	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	AHSS Continuous Galvanizing Line Boilers	54	MMBtu/hr	Good operating practices□ □ Boiler □ Efficiency	117.0000	LB/MMBTU
EXPLORATORY VENTURES LLC	3/5/2024	Pickle Galvanizing Line Boiler	54	lb/MMBtu	Good operating practices	117.0000	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler NGO Line	0		Good combustion practices□ Energy efficient burners□ Combustion of natural gas	117.0000	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Cold Mill Boiler	0		Good combustion practices□ Energy efficient burners□ Combustion of natural gas	117.0000	LB/MMBTU
BIG RIVER STEEL LLC	2/8/2024	Color Coating Line Boiler	0		Good combustion practices□ Energy efficient burners□ Combustion of natural gas	117.0000	LB/MMBTU
NUCOR STEEL	3/30/2023	Boiler (CC-BOIL)	50	MMBtu/hr	energy efficiency measures and only pipeline quality natural gas fuel shall be combusted	117.1000	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Line Boiler	54	MMBtu/hr	Good operating practices□ Minimum Boiler Efficiency	117.0000	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Galvanizing Line Boilers #1 and #2	54	MMBtu/hr	Good operating practices□ Minimum Boiler Efficiency	117.0000	LB/MMBTU
BIG RIVER STEEL LLC	1/31/2022	Pickle Galvanizing Line Boiler	54	MMBtu/hr	Good operating practices	117.0000	LB/MMBTU
NUCOR STEEL ARKANSAS	9/1/2021	SN-202, 203, 204 Pickle Line Boilers	0		Good Combustion Practice	121.0000	LB/MMBTU
NUCOR STEEL GALLATIN, LLC	4/19/2021	Vacuum Degasser Boiler (EP 20-13)	50	MMBtu/hr	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	26125.0000	TONS/YR
NUCOR STEEL GALLATIN, LLC	4/19/2021	Pickle Line #2 â€“ Boiler #1 & #2 (EP 21-04 & EP 21-05)	18	MMBtu/hr, each	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.	12675.0000	TONS/YR
SDSW STEEL MILL	1/17/2020	Pickling Line Boilers	0		GOOD COMBUSTION PRACTICES, CLEAN FUEL	117.1000	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-142 Vacuum Degasser Boiler	50	MMBTU/hr	Good combustion practices	121.0000	LB/MMBTU
NUCOR STEEL ARKANSAS	2/14/2019	SN-233 Galvanizing Line Boilers	15	MMBTU/hr each	Good combustion practices	121.0000	LB/MMBTU
NUCOR STEEL - BERKELEY	5/4/2018	Pickle Line Equipment (pickle line no. 3 boilers)	0		Use of natural gas and efficient combustion technology through good combustion practices	15965.0000	TPY
NUCOR STEEL - BERKELEY	5/4/2018	Vacuum Tank Degasser Equipment (vacuum degasser boiler 2)	0		Use of natural gas and efficient combustion technology through good combustion practices.	26028.0000	TPY

Summary of RBLC Results for PM/PM10/PM2.5 Emissions from Anneal and Coating Line – Cooling Section
Process Type: 81.290 - Other Steel Manufacturing Processes

PM Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	POLLUTANT	PM EMISSION LIMIT	PM EMISSION LIMIT UNITS
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	90,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, total (TPM10)	0.5400	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	90,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, total (TPM2.5)	0.0017	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	90,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, filterable (FPM)	0.7800	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-06 - Light Plate Quench DCW Cooling Tower	8,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, total (TPM10)	0.0400	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-06 - Light Plate Quench DCW Cooling Tower	8,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, total (TPM2.5)	0.0001	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-06 - Light Plate Quench DCW Cooling Tower	8,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, filterable (FPM)	0.0600	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	3,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, total (TPM10)	0.0200	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	3,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, total (TPM2.5)	0.0001	LB/HR
NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	3,000	gal/min	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	Particulate matter, filterable (FPM)	0.0200	LB/HR
AK STEEL CORPORATION ROCKPORT WORKS	2/24/2015	APL: AIR QUENCH STATION	130	T/H	BAGHOUSE	Particulate matter, total (TPM10)	1.7270	LB/H

Summary of RBLC Results for NOx Emissions from Hydrogen Purging
Process Type: 81.290 - Other Steel Manufacturing Processes

NOx Emission Limit

FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	THROUGHPUT	THROUGHPUT UNITS	CONTROL METHOD DESCRIPTION	NOx EMISSION LIMIT	NOx EMISSION LIMIT UNITS
NUCOR YAMATO STEEL COMPANY (LIMITED PARTNERSHIP)	6/1/2018	Vacuum tank Degasser and Flare	150	tons per hour	Proper equipment design and operation	0.0980	LB/MMBTU
NUCOR STEEL - BERKELEY	5/4/2018	Vacuum Tank Degasser Equipment (vaccum tank degasser flares)	0			0.0000	
NUCOR STEEL TUSCALOOSA, INC.	7/22/2014	Vacuum Degasser with flare and cooling towers	0		Flare	0.0050	LB/T

APPENDIX F CAM PLAN

Arcelor Mittal
Cold Rolling Mill 1
Compliance Assurance Monitoring Plan
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1.0 Introduction

Under 40 CFR Part 64, compliance assurance monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units. The CAM plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies only to emission units that are subject to an emission limitation or standard (other than an emissions limit or standard exempt under 40 CFR §64.3(b)), and that use a control device to achieve compliance with such emission limit or standard, and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program.

The cold rolling mill 1 is controlled by a mist eliminator and a condenser. The cold rolling mill 1 operations, pre-controlled, emit PM at levels that would, by themselves, exceed a major source threshold, and are subject to a Prevention of Significant Deterioration (PSD) / Best Achievable Control Technology (BACT) limit under Alabama Administrative Code (AAC) 335-3-14-.04 for PM.

This CAM plan addresses the monitoring approach, performance indicators, and rationale for selecting the performance indicators and their ranges to verify compliance with the proposed emission limits for the condenser which collects particulate emissions from the cold rolling mill 1 operations.

2.0 Monitoring Approach

Monitoring of the mist eliminator and condenser for compliance is accomplished by:

1. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.
2. Monitoring of differential pressure
3. Monitoring of outlet temperature.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

1. Inspection and preventative maintenance was selected as a performance indicator. Qualified maintenance personnel will conduct the inspections and preventative maintenance in accordance with work practices and procedures.
2. Monitoring of differential pressure across the mist eliminator system was selected as a performance indicator because it is indicative of good operation and maintenance of the mist eliminator system.
3. Monitoring of outlet temperature across the cold rolling mill condenser was selected as a performance indicator because it is indicative of good operation and maintenance of the condenser.

4.0 Rationale for Selection of Indicator Ranges

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Cold Rolling Mill 1
Compliance Assurance Monitoring Plan
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The rationale for the selection of the indicator ranges associated with the performance indicators above is as follows:

1. The indicator range for maintenance and inspection is the observation of visible emissions.
2. The indicator range for the differential pressure will be based on best operating practices per the manufacturer.
3. The indicator range for maintenance and inspection for the outlet temperature will be based on best operating practices per the manufacturer.

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Cold Rolling Mill 1
Compliance Assurance Monitoring Plan
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Cold Rolling Mill 1 Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**	**Performance Indicator 3**
1	**Indicator**	**Inspection/Maintenance**	**Differential Pressure**	**Outlet Temperature**
A.	Measurement	Semi-annual inspections and applicable maintenance according to work practices and procedures.	Differential pressure across the mist eliminator system will be measured using a differential pressure gauge.	Outlet temperature for the cold rolling mill will be measured using a temperature gauge.
2	**Indicator Range/Excursion**	Excursions are defined as both not conducting semiannual inspections properly and not performing maintenance according to work practices and procedures.	The pressure differential range will be based on best engineering practices and provided by the manufacturer. Excursions will trigger an inspection, corrective action, and a reporting requirement.	The outlet temperature will be set based on best engineering practices.
3	**Performance Criteria**			
A.	Data Representativeness	Inspections will be performed for the emission controls system.	The differential pressure will measure the pressure difference between the inlet and outlet of the mist eliminator system.	The temperature gauge will measure the exhaust temperature.
B	Verification of Operational Status	NA.	Records of the readings will be maintained by the environmental department.	Records of the readings will be maintained by the environmental department.

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Cold Rolling Mill 1
Compliance Assurance Monitoring Plan
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CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**	**Performance Indicator 3**
C	QA/QC Practices & Criteria	Qualified personnel will perform inspections and maintenance.	The differential pressure gauge will have a performance check annually.	The temperature gauge will have a performance check annually.
D	Monitoring Frequency	Semi-annual inspections and preventative maintenance conducted as needed.	Once per shift.	Once per shift.
4	**Data Collection Procedures**	Records are maintained to document quarterly inspections and any required maintenance.	The differential pressure will be recorded with date and time.	The outlet temperature will be recorded with the data and time.
5	**Averaging Period**	NA.	Once per shift.	Once per shift.
6	**Record Keeping**	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of excursion, and corrective action taken.

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Cold Rolling Mill 2
Compliance Assurance Monitoring Plan
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1.0 Introduction

Under 40 CFR Part 64, compliance assurance monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units. The CAM plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies only to emission units that are subject to an emission limitation or standard (other than an emissions limit or standard exempt under 40 CFR §64.3(b)), and that use a control device to achieve compliance with such emission limit or standard, and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program.

The cold rolling mill 2 is controlled by a mist eliminator and a condenser. The cold rolling mill 2 operations, pre-controlled, emit PM at levels that would, by themselves, exceed a major source threshold, and are subject to a Prevention of Significant Deterioration (PSD) / Best Achievable Control Technology (BACT) limit under Alabama Administrative Code (AAC) 335-3-14-.04 for PM.

This CAM plan addresses the monitoring approach, performance indicators, and rationale for selecting the performance indicators and their ranges to verify compliance with the proposed emission limits for the condenser which collects particulate emissions from the cold rolling mill 2 operations.

2.0 Monitoring Approach

Monitoring of the mist eliminator and condenser for compliance is accomplished by:

1. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.
2. Monitoring of differential pressure
3. Monitoring of outlet temperature.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

1. Inspection and preventative maintenance was selected as a performance indicator. Qualified maintenance personnel will conduct the inspections and preventative maintenance in accordance with work practices and procedures.
2. Monitoring of differential pressure across the mist eliminator system was selected as a performance indicator because it is indicative of good operation and maintenance of the mist eliminator system.
3. Monitoring of outlet temperature across the cold rolling mill condenser was selected as a performance indicator because it is indicative of good operation and maintenance of the condenser.

4.0 Rationale for Selection of Indicator Ranges

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Cold Rolling Mill 2
Compliance Assurance Monitoring Plan
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The rationale for the selection of the indicator ranges associated with the performance indicators above is as follows:

1. The indicator range for maintenance and inspection is the observation of visible emissions.
2. The indicator range for the differential pressure will be based on best operating practices per the manufacturer.
3. The indicator range for maintenance and inspection for the outlet temperature will be based on best operating practices per the manufacturer.

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Cold Rolling Mill 2
Compliance Assurance Monitoring Plan
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Cold Rolling Mill 2 Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**	**Performance Indicator 3**
1	**Indicator**	**Inspection/Maintenance**	**Differential Pressure**	**Outlet Temperature**
A.	Measurement	Semi-annual inspections and applicable maintenance according to work practices and procedures.	Differential pressure across the mist eliminator system will be measured using a differential pressure gauge.	Outlet temperature for the cold rolling mill will be measured using a temperature gauge.
2	**Indicator Range/Excursion**	Excursions are defined as both not conducting semiannual inspections properly and not performing maintenance according to work practices and procedures.	The pressure differential range will be based on best engineering practices and provided by the manufacturer. Excursions will trigger an inspection, corrective action, and a reporting requirement.	The outlet temperature will be set based on best engineering practices.
3	**Performance Criteria**			
A.	Data Representativeness	Inspections will be performed for the emission controls system.	The differential pressure will measure the pressure difference between the inlet and outlet of the mist eliminator system.	The temperature gauge will measure the exhaust temperature.
B	Verification of Operational Status	NA.	Records of the readings will be maintained by the environmental department.	Records of the readings will be maintained by the environmental department.

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Cold Rolling Mill 2
Compliance Assurance Monitoring Plan
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CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**	**Performance Indicator 3**
C	QA/QC Practices & Criteria	Qualified personnel will perform inspections and maintenance.	The differential pressure gauge will have a performance check annually.	The temperature gauge will have a performance check annually.
D	Monitoring Frequency	Semi-annual inspections and preventative maintenance conducted as needed.	Once per shift.	Once per shift.
4	**Data Collection Procedures**	Records are maintained to document quarterly inspections and any required maintenance.	The differential pressure will be recorded with date and time.	The outlet temperature will be recorded with the data and time.
5	**Averaging Period**	NA.	Once per shift.	Once per shift.
6	**Record Keeping**	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of excursion, and corrective action taken.

Arcelor Mittal
Oven + RTO 1
Compliance Assurance Monitoring Plan
APPENDIX F

1.0 Introduction

Under 40 CFR Part 64, compliance assurance monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units. The CAM plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies only to emission units that are subject to an emission limitation or standard (other than an emissions limit or standard exempt under 40 CFR §64.3(b)), and that use a control device to achieve compliance with such emission limit or standard, and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program.

The curing oven is controlled by a regenerative thermal oxidizer (RTO). The oven operations, pre-controlled, emit VOC at levels that would, by themselves, exceed a major source threshold, and are subject to a Prevention of Significant Deterioration (PSD) / Best Achievable Control Technology (BACT) limit under Alabama Administrative Code (AAC) 335-3-14-.04 for VOC.

The RTO collects air emissions from the curing oven exhaust airstreams containing VOCs, raises the airstream to high temperature to oxidize the pollutants into CO_2 and H_2O before releasing the airstream into the atmosphere. The RTO combusts natural gas to reach the required temperature and thermocouples inside the chamber monitor temperature and adjust gas burner firing as needed.

This CAM plan addresses the monitoring approach, performance indicators, and rationale for selecting the performance indicators and their ranges to verify compliance with the proposed emission limits for the scrubber which collects particulate emissions from the pickling line operations.

2.0 Monitoring Approach

Monitoring of the scrubber for compliance is accomplished by:

1. Monitoring of thermal oxidizer temperature.

2. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

1. Monitoring of thermal oxidizer temperature was selected as a performance indicator because the RTO operates by raising the temperature of the exhaust gas from the curing oven to further break down the VOC from the oven into CO_2 and H_2O. A minimum temperature is required to demonstrate that the RTO is successfully operating.

2. Inspection and preventative maintenance was selected as a performance indicator. Qualified maintenance personnel will conduct the inspections and preventative maintenance in accordance with work practices and procedures.

4.0 Rationale for Selection of Indicator Ranges

The rationale for the selection of the indicator ranges associated with the performance indicators above is as follows:

1. The indicator range for the temperature will be based on the level equal to or greater than that recorded during the latest emissions test that indicated compliance with the applicable emissions limits.

2. The indicator range for maintenance and inspection is the observation of visible emissions.

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Oven + RTO 1
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Oven + RTO 1 Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
1	**Indicator**	**Temperature**	**Inspection/Maintenance**
A.	Measurement	The RTO temperature will be measured using the RTO controller.	Semi-annual inspections and applicable maintenance according to work practices and procedures.
2	**Indicator Range/Excursion**	An excursion is defined as a 3-hr block average below the minimum required temperature when the RTO is in operation.	An excursion is defined as the observation of visible emissions.
3	**Performance Criteria**		
A.	Data Representativeness	The RTO temperature will be measured using the instrumentation provided with the RTO.	Inspections will be performed at the RTO.
B	Verification of Operational Status	Records of the readings will be maintained by the environmental department.	Inspection records will be maintained by the environmental department.

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CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
C	QA/QC Practices & Criteria	Controller will develop and implement a periodic performance check system.	Qualified personnel will perform inspections and maintenance.
D	Monitoring Frequency	At least once every 15 Minutes.	Semi-annual.
4	**Data Collection Procedures**	The temperature will be recorded with date and time.	Records are maintained to document semi-annual inspections and any required maintenance.
5	**Averaging Period**	3-hr.	NA.
6	**Record Keeping**	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of any excursion and the corrective action taken.

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Oven + RTO 2
Compliance Assurance Monitoring Plan
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1.0 Introduction

Under 40 CFR Part 64, compliance assurance monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units. The CAM plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies only to emission units that are subject to an emission limitation or standard (other than an emissions limit or standard exempt under 40 CFR §64.3(b)), and that use a control device to achieve compliance with such emission limit or standard, and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program.

The curing oven is controlled by a regenerative thermal oxidizer (RTO). The oven operations, pre-controlled, emit VOC at levels that would, by themselves, exceed a major source threshold, and are subject to a Prevention of Significant Deterioration (PSD) / Best Achievable Control Technology (BACT) limit under Alabama Administrative Code (AAC) 335-3-14-.04 for VOC.

The RTO collects air emissions from the curing oven exhaust airstreams containing VOCs, raises the airstream to high temperature to oxidize the pollutants into CO_2 and H_2O before releasing the airstream into the atmosphere. The RTO combusts natural gas to reach the required temperature and thermocouples inside the chamber monitor temperature and adjust gas burner firing as needed.

This CAM plan addresses the monitoring approach, performance indicators, and rationale for selecting the performance indicators and their ranges to verify compliance with the proposed emission limits for the scrubber which collects particulate emissions from the pickling line operations.

2.0 Monitoring Approach

Monitoring of the scrubber for compliance is accomplished by:

1. Monitoring of thermal oxidizer temperature.

2. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

1. Monitoring of thermal oxidizer temperature was selected as a performance indicator because the RTO operates by raising the temperature of the exhaust gas from the curing oven to further break down the VOC from the oven into CO_2 and H_2O. A minimum temperature is required to demonstrate that the RTO is successfully operating.

2. Inspection and preventative maintenance was selected as a performance indicator. Qualified maintenance personnel will conduct the inspections and preventative maintenance in accordance with work practices and procedures.

4.0 Rationale for Selection of Indicator Ranges

The rationale for the selection of the indicator ranges associated with the performance indicators above is as follows:

1. The indicator range for the temperature will be based on the level equal to or greater than that recorded during the latest emissions test that indicated compliance with the applicable emissions limits.

2. The indicator range for maintenance and inspection is the observation of visible emissions.

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Oven + RTO 2
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Oven + RTO 2 Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
1	**Indicator**	**Temperature**	**Inspection/Maintenance**
A.	Measurement	The RTO temperature will be measured using the RTO controller.	Semi-annual inspections and applicable maintenance according to work practices and procedures.
2	**Indicator Range/Excursion**	An excursion is defined as a 3-hr block average below the minimum required temperature when the RTO is in operation.	An excursion is defined as the observation of visible emissions.
3	**Performance Criteria**		
A.	Data Representativeness	The RTO temperature will be measured using the instrumentation provided with the RTO.	Inspections will be performed at the RTO.
B	Verification of Operational Status	Records of the readings will be maintained by the environmental department.	Inspection records will be maintained by the environmental department.

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CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
C	QA/QC Practices & Criteria	Controller will develop and implement a periodic performance check system.	Qualified personnel will perform inspections and maintenance.
D	Monitoring Frequency	At least once every 15 Minutes.	Semi-annual.
4	**Data Collection Procedures**	The temperature will be recorded with date and time.	Records are maintained to document semi-annual inspections and any required maintenance.
5	**Averaging Period**	3-hr.	NA.
6	**Record Keeping**	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of any excursion and the corrective action taken.

Arcelor Mittal
Pickling Line Scrubber
Compliance Assurance Monitoring Plan
APPENDIX F

1.0 Introduction

Under 40 CFR Part 64, compliance assurance monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units. The CAM plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies only to emission units that are subject to an emission limitation or standard (other than an emissions limit or standard exempt under 40 CFR §64.3(b)), and that use a control device to achieve compliance with such emission limit or standard, and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program.

The pickling lines are controlled by a wet scrubber. The pickling line operations, pre-controlled, emit PM at levels that would, by themselves, exceed a major source threshold, and are subject to a Prevention of Significant Deterioration (PSD) / Best Achievable Control Technology (BACT) limit under Alabama Administrative Code (AAC) 335-3-14-.04 for PM.

The exhaust system of the pickling line captures the emissions from several areas along the line and combines the flow together into a single run of ductwork. This airstream is routed through a wet scrubber where the particulate matter is captured in the liquid.

This CAM plan addresses the monitoring approach, performance indicators, and rationale for selecting the performance indicators and their ranges to verify compliance with the proposed emission limits for the scrubber which collects particulate emissions from the pickling line operations.

2.0 Monitoring Approach

Monitoring of the scrubber for compliance is accomplished by:

1. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.

2. Monitoring of Visual Emissions.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

1. Inspection and preventative maintenance was selected as a performance indicator. Qualified maintenance personnel will conduct the inspections and preventative maintenance in accordance with work practices and procedures.

2. Monitoring of visual emissions was selected as a performance indicator because opacity is a good indicator of proper operation and maintenance of the scrubber. When the scrubber is operating optimally, there will be no visible emissions. In general, an increase in visible emissions indicates reduced performance of the scrubber. The emission unit has an opacity standard of less than 10 percent.

4.0 Rationale for Selection of Indicator Ranges

The rationale for the selection of the indicator ranges associated with the performance indicators above is as follows:

1. The indicator range for maintenance and inspection is the observation of visible emissions.

2. The indicator range for opacity is a 6-minute average opacity of less than 10 percent. This indicator range was selected based on AAC 335-3-14-.04 and because an increase in visible emissions is indicative of an increase in particulate emissions.

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Pickling Line Scrubber
Compliance Assurance Monitoring Plan
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Pickling Line Scrubber Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
1	**Indicator**	**Inspection/Maintenance**	**Opacity**
A.	Measurement	Quarterly inspections and applicable maintenance according to work practices and procedures.	A visual check for emissions will be performed at least once per day. These checks will be performed by a person familiar with EPA Method 9. If any visible emissions are noted, and not corrected within a period of one (1) hour, then a Method 9 will be performed within 4 hours of the initial observation.
2	**Indicator Range/Excursion**	An excursion is defined as the observation of visible emissions.	An excursion is defined as the presence of visible emissions greater than 10% opacity. Excursions trigger an inspection, corrective action, and a reporting requirement.
3	**Performance Criteria**		
A.	Data Representativeness	Inspections will be performed at the scrubber	Visual inspection logs will be maintained and audited to ensure VE readings are conducted.
B	Verification of Operational Status	NA.	Records of the readings will be maintained by the environmental department.

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Pickling Line Scrubber
Compliance Assurance Monitoring Plan
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CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
C	QA/QC Practices & Criteria	Qualified personnel will perform inspections and maintenance.	Method 9 Reader will be certified, and training records will be maintained by the environmental department.
D	Monitoring Frequency	Quarterly.	Daily.
4	**Data Collection Procedures**	Records are maintained to document quarterly inspections and any required maintenance.	The VE observer will be familiar with scrubber operations and be familiar with Method 9.
5	**Averaging Period**	NA.	6 minute average (Method 9).
6	**Record Keeping**	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of excursion, and corrective action taken.

Arcelor Mittal
Shot Blaster Baghouse
Compliance Assurance Monitoring Plan
APPENDIX F

1.0 Introduction

Under 40 CFR Part 64, compliance assurance monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units. The CAM plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies only to emission units that are subject to an emission limitation or standard (other than an emissions limit or standard exempt under 40 CFR §64.3(b)), and that use a control device to achieve compliance with such emission limit or standard, and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program.

The shot blaster is controlled by a baghouse. The shot blaster operations, pre-controlled, emit PM at levels that would, by themselves, exceed a major source threshold, and are subject to a Prevention of Significant Deterioration (PSD) / Best Achievable Control Technology (BACT) limit under Alabama Administrative Code (AAC) 335-3-14-.04 for PM.

The exhaust system of the shot blaster captures the emissions from several areas along the line and combines the flow together into a single run of ductwork. This airstream is routed through a baghouse where the particulate matter is captured in the filter media.

This CAM plan addresses the monitoring approach, performance indicators, and rationale for selecting the performance indicators and their ranges to verify compliance with the proposed emission limits for the baghouse which collects particulate emissions from the shot blaster operations.

2.0 Monitoring Approach

Monitoring of the baghouse for compliance is accomplished by:

1. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.

2. Monitoring of Visual Emissions.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

1. Inspection and preventative maintenance was selected as a performance indicator. Qualified maintenance personnel will conduct the inspections and preventative maintenance in accordance with work practices and procedures.

2. Monitoring of visual emissions was selected as a performance indicator because opacity is a good indicator of proper operation and maintenance of the baghouse. When the baghouse is operating optimally, there will be no visible emissions. In general, an increase in visible emissions indicates reduced performance of the baghouse. The emission unit has an opacity standard of less than 10 percent.

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Shot Blaster Baghouse
Compliance Assurance Monitoring Plan
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4.0 Rationale for Selection of Indicator Ranges

The rationale for the selection of the indicator ranges associated with the performance indicators above is as follows:

1. The indicator range for maintenance and inspection is the observation of visible emissions.

2. The indicator range for opacity is a 6-minute average opacity of less than 10 percent. This indicator range was selected based on AAC 335-3-14-.04 and because an increase in visible emissions is indicative of an increase in particulate emissions.

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Shot Blaster Baghouse
Compliance Assurance Monitoring Plan
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Shot Blaster Baghouse Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
1	**Indicator**	**Inspection/Maintenance**	**Opacity**
A.	Measurement	Semi-annual inspections and applicable maintenance according to work practices and procedures.	A visual check for emissions will be performed at least once per day. These checks will be performed by a person familiar with EPA Method 9. If any visible emissions are noted, and not corrected within a period of one (1) hour, then a Method 9 will be performed within 4 hours of the initial observation.
2	**Indicator Range/Excursion**	Excursions are defined as both not conducting semiannual inspections properly and not performing maintenance according to work practices and procedures.	An excursion is defined as the presence of visible emissions greater than 10% opacity. Excursions trigger an inspection, corrective action, and a reporting requirement.
3	**Performance Criteria**		
A.	Data Representativeness	Inspections will be performed at the baghouse.	Visual inspection logs will be maintained and audited to ensure VE readings are conducted.
B	Verification of Operational Status	NA.	Records of the readings will be maintained by the environmental department.

Arcelor Mittal
Shot Blaster Baghouse
Compliance Assurance Monitoring Plan
APPENDIX F

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
C	QA/QC Practices & Criteria	Qualified personnel will perform inspections and maintenance.	Method 9 Reader will be certified, and training records will be maintained by the environmental department.
D	Monitoring Frequency	Semi-annual inspections and preventative maintenance conducted as needed.	Daily.
4	**Data Collection Procedures**	Records are maintained to document quarterly inspections and any required maintenance.	The VE observer will be familiar with baghouse operations and be familiar with Method 9.
5	**Averaging Period**	NA.	6 minute average (Method 9).
6	**Record Keeping**	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of excursion, and corrective action taken.

Arcelor Mittal
Tank Farm Scrubber
Compliance Assurance Monitoring Plan
APPENDIX F

1.0 Introduction

Under 40 CFR Part 64, compliance assurance monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units. The CAM plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies only to emission units that are subject to an emission limitation or standard (other than an emissions limit or standard exempt under 40 CFR §64.3(b)), and that use a control device to achieve compliance with such emission limit or standard, and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program.

The tank farm is controlled by a wet scrubber. The tank farm operations, pre-controlled, emit PM at levels that would, by themselves, exceed a major source threshold, and are subject to a Prevention of Significant Deterioration (PSD) / Best Achievable Control Technology (BACT) limit under Alabama Administrative Code (AAC) 335-3-14-.04 for PM.

The exhaust system for each tank captures the emissions from several areas along the line and combines the flow together into a single run of ductwork. This airstream is routed through a wet scrubber where the particulate matter is captured in the liquid.

This CAM plan addresses the monitoring approach, performance indicators, and rationale for selecting the performance indicators and their ranges to verify compliance with the proposed emission limits for the scrubber which collects particulate emissions from the tank farm operations.

2.0 Monitoring Approach

Monitoring of the scrubber for compliance is accomplished by:

1. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.

2. Monitoring of Visual Emissions.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

1. Inspection and preventative maintenance was selected as a performance indicator. Qualified maintenance personnel will conduct the inspections and preventative maintenance in accordance with work practices and procedures.

2. Monitoring of visual emissions was selected as a performance indicator because opacity is a good indicator of proper operation and maintenance of the scrubber. When the scrubber is operating optimally, there will be no visible emissions. In general, an increase in visible emissions indicates reduced performance of the scrubber. The emission unit has an opacity standard of less than 10 percent.

4.0 Rationale for Selection of Indicator Ranges

The rationale for the selection of the indicator ranges associated with the performance indicators above is as follows:

1. The indicator range for maintenance and inspection is the observation of visible emissions.

2. The indicator range for opacity is a 6-minute average opacity of less than 10 percent. This indicator range was selected based on AAC 335-3-14-.04 and because an increase in visible emissions is indicative of an increase in particulate emissions.

Arcelor Mittal
Tank Farm Scrubber
Compliance Assurance Monitoring Plan
APPENDIX F

Tank Farm Scrubber Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
1	**Indicator**	**Inspection/Maintenance**	**Opacity**
A.	Measurement	Semi-annual inspections and applicable maintenance according to work practices and procedures.	A visual check for emissions will be performed at least once per day. These checks will be performed by a person familiar with EPA Method 9. If any visible emissions are noted, and not corrected within a period of one (1) hour, then a Method 9 will be performed within 4 hours of the initial observation.
2	**Indicator Range/Excursion**	An excursion is defined as the observation of visible emissions.	An excursion is defined as the presence of visible emissions greater than 10% opacity. Excursions trigger an inspection, corrective action, and a reporting requirement.
3	**Performance Criteria**		
A.	Data Representativeness	Inspections will be performed at the scrubber.	Visual inspection logs will be maintained and audited to ensure VE readings are conducted.
B	Verification of Operational Status	NA.	Records of the readings will be maintained by the environmental department.
C	QA/QC Practices & Criteria	Qualified personnel will perform inspections and maintenance.	Method 9 Reader will be certified, and training records will be maintained by the environmental department.

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CAM Monitoring Approach		Performance Indicator 1	Performance Indicator 2
D	Monitoring Frequency	Semi-annual.	Daily.
4	**Data Collection Procedures**	Records are maintained to document semi-annual inspections and any required maintenance.	The VE observer will be familiar with scrubber operations and be familiar with Method 9.
5	**Averaging Period**	NA.	6 minute average (Method 9).
6	**Record Keeping**	Maintain records for a period of 5 years.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of excursion, and corrective action taken.

ERM

APPENDIX G AIR DISPERSION MODELING REPORT

Prevention of Significant Deterioration (PSD) Permit

Air Dispersion Modeling Report

PREPARED FOR

AMC Calvert

DATE
25 March 2025

REFERENCE
0721801

SIGNATURE PAGE

Prevention of Significant Deterioration (PSD) Permit

Air Dispersion Modeling Report

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1. INTRODUCTION

AM/NS Calvert, L.L.C. (AM/NS), a joint venture between Arcelor Mittal and Nippon Steel, owns and operates a carbon steel mill located in Calvert, Alabama. The facility was previously owned and operated by ThyssenKrupp Steel USA, L.L.C. (TKS). TKS submitted Prevention of Significant Deterioration (PSD) permit applications for the carbon steel mill and obtained construction authorizations via PSD permits issued by the Alabama Department of Environmental Management (ADEM). Initial operation of certain sources at the facility commenced in June 2010 under Temporary Authorizations to Operate (TAOs) issued by ADEM. As per Alabama Administrative Code (AAC) 335-3-16-.04(1), an initial Title V operating permit application was submitted within 12 months after the commencement of operations. AM/NS acquired the facility in February of 2014, and filed the necessary transfer of ownership notifications. The most recent Title V permit was issued by ADEM on October 22, 2021 (Permit Number 503-0095).

Arcelor Mittal Calvert, L.L.C. (AMC) is adding steel processing operations on the shared AM/NS property and is submitting this permit application to request authorization for the following additions:

- Construction of a new annealing and pickling line;
- Construction of two (2) new annealing and coating lines;
- Construction of two (2) new cold rolling mills; and
- Construction of any ancillary sources for these process lines.

The modeling report is organized as follows:

- Section 1 – Introduction and Facility Description;
- Section 2 – Summary of Emission Calculations;
- Section 3 – PSD applicability analysis;
- Section 4 – Applicable Air Quality Standards;
- Section 5 – Air Quality Dispersion Model;
- Section 6 – Emission Inventory Data;
- Section 7 – Meteorological Data;
- Section 8 – Receptor Grid;
- Section 9 – Ambient Background Concentrations;
- Section 10 – Air Quality Impact Analysis;
- Section 11 – Impact on PSD Class I Areas
- Appendix A – SIL Modeling Results Figures
- Appendix B – Emissions and Exhaust Parameters of the Existing AM/NS sources
- Appendix C – MERPs Hypothetical Source and Ozone Monitor Justification

1.1 FACILITY DESCRIPTION

The facility manufactures and processes carbon steel products for high-value applications by manufacturers in North America and throughout the North American Free Trade Agreement (NAFTA) region. The facility can produce various grades and/or types of steel strips in various forms (i.e., coils, slits, sheets, blanks, and so on) with various coatings, finishes, and properties for general industrial use. Much of the product is consumed by the automotive industry, appliance industry, tube manufacturers, steel fabricators, and steel service centers, among others.

Raw materials for the production of the non-grain oriented electrical steels (NOES) will be provided by the AM/NS facility. Comprised of various alloys, the Steel Making Facility will melt the raw materials in the Electric Arc Furnace, and then cast steel slabs. The slabs will then await rolling time in the AM/NS Hot Strip Mill (HSM). It is the HSM where the steel slabs are heated and rolled to form the flat strip, which is then coiled for shipment to the NOES mill, within the Calvert site.

A detailed description of the changes proposed with this project will be provided with the permit application package.

The Project approximate central location is at UTM X = 405129.82 meters, UTM Y = 3444724.8 meters, Zone 16, NAD83. This coordinate was used as a center point to determine the significance radius. The proposed site will be graded to approximately 49 feet. For modeling purposes, all Project sources and buildings are assumed to be at 49 feet.

2. EMISSION CALCULATIONS

A summary of the Potential To Emit (PTE) from the proposed Project is provided in Table 2-1. The specific emission calculation details are included in the PSD application package.

TABLE 2-1 SUMMARY OF PROJECT EMISSIONS

Project Potential to Emit	
Pollutant	**Annual Emissions Rate (tpy)**
PM	44.41
PM_{10}	41.63
$PM_{2.5}$	30.76
CO	78.50
SO_2	0.59
NO_x	72.93
VOC	53.97
Lead (Pb)	0.0005
Total HAP	11.81
CO_2e	122,123.78

3. PSD APPLICABILITY ANALYSIS

AMC is located in Mobile County, which is currently designated as being in attainment of all National Ambient Air Quality Standards (NAAQS). Because the plant is located in an attainment area, Nonattainment New Source Review (NNSR) would not currently apply to this project. Therefore, the only New Source Review (NSR) mechanism considered in this analysis is PSD.

PSD applies to new major stationary sources or major modifications at existing major stationary sources located in NAAQS attainment or unclassifiable areas. AMC is an existing major stationary source in an attainment area. Per ADEM Administrative Code (AAC) 335-3-14-.04(2)(b), a major modification at an existing major stationary source is defined as follows:

"Major modification shall mean any physical change in or change in the method of operation at a major stationary source that would result in a significant net emissions increase of any regulated NSR pollutant."

A detailed applicability analysis of PSD to the changes proposed in this application is presented below.

As the NOES project involves construction of new emission sources, the project qualifies as a physical change and the proposed project emissions were compared to the PSD "Significant Emission Rate (SER)" of subject pollutants to determine if the project constitutes a major modification to an existing major source facility. The NOES project is not expected to have an effect on actual emissions from existing sources at the facility. The results of this comparison are presented in Table 3-1 below.

TABLE 3-1 PSD APPLICABILITY ANALYSIS

Pollutant	Baseline Actual Emissions (tpy)	Project Potential Emissions (tpy)	Net Emissions Increase[1] (tpy)	PSD SER (tpy)	PSD Review Triggered?
PM	0	44.41	44.41	25	YES
PM_{10}	0	41.63	41.63	15	YES
$PM_{2.5}$	0	30.76	30.76	10	YES
CO	0	78.50	78.50	100	NO
SO_2	0	0.59	0.59	40	NO
NO_x	0	72.93	72.93	40	YES
VOC	0	53.97	53.97	40	YES
Pb	0	0.0005	0.0005	0.6	NO
CO_2e	0	122,123.78	122,123.78	75,000	YES

[1] The project emission increases are conservatively assumed to be equal to the net emissions increase.

As shown in Table 3-1, the net emissions increase of some of these PSD pollutants is greater than the respective PSD SERs and therefore, these pollutants are subject to PSD review. Detailed emission calculations are provided in Appendix B. For projects that trigger PSD permitting requirements, the following items are required to be addressed in the permit application:

- Determination of BACT for each pollutant which triggers PSD review;
- National Ambient Air Quality Standards (NAAQS) and PSD Increment Air Quality analysis;
- Additional Health Impact Analysis; and
- Class I Area Impact.

The detailed BACT analysis is included in the PSD application package. This document describes the methods and results of the modeling analysis for pollutants subject to PSD review.

4. APPLICABLE AIR QUALITY STANDARDS

Air quality impact analyses to support the proposed modification were performed to demonstrate compliance with the NAAQS and PSD increment standards for the averaging periods and criteria pollutants listed in Table 4-1. Project-only significant impact level (SIL) modeling was performed for each of these standards and subsequent cumulative modeling is described in Section 10. The SIL modeling was also be used to assess if any pre-constructive modeling is necessary by comparing against the Significant Monitoring Concentration (SMC). The SILs, NAAQS, SMC and PSD Increment thresholds are presented in Table 4-1.

TABLE 4-1 APPLICABLE NAAQS AND PSD INCREMENT LEVELS

Pollutant	Averaging Period	SIL[a] (µg/m³)	SMC[a] (µg/m³)	NAAQS (µg/m³)	PSD Class II Increment (µg/m³)
Nitrogen Dioxide (NO_2)	1-hour	7.5[c]	N/A	188[d]	Not Established
	Annual	1	14	100[a]	25
Particulate Matter less than 10 microns (PM_{10})	24-hour	5	10	150[e]	30[b]
	Annual	1	N/A	Revoked	17[a]
Particulate Matter less than 2.5 microns ($PM_{2.5}$)	24-hour	1.2	[f]	35[i]	9[b]
	Annual	0.13	N/A	9[a]	4[a]
Ozone	8-hour	1 ppb	N/A	70 ppb	N/A

a The maximum high 1st-high predicted concentration modeled over five years of meteorological data.

b Not to be exceeded more than once per year.

c U.S. EPA interim SIL, based on SIL of 4 ppb, recommended in the U.S. EPA Memorandum, *Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program*, June 29, 2010.

d Five year average high-8th-high of the maximum daily 1-hour concentrations.

e High sixth high over five years of concatenated meteorological data.

f $PM_{2.5}$ SMC was vacated and remanded on January 22, 2013 by the United States District Court, D.C. Circuit.

i Five year average high-8th-high of the maximum daily concentrations.

5. AIR QUALITY DISPERSION MODEL

5.1 MODEL OPTIONS

Per ADEM modeling guidelines [2], the air quality modeling analyses employed the AMS/EPA Regulatory Model (AERMOD), version 24142. The following settings were used in the AERMOD model:

- terrain represented by receptor elevations and hill height scales
- regulatory default model parameters, including:
  - calm correction
  - buoyancy induced dispersion
  - stack-tip downwash
  - direction specific building downwash
  - final plume rise
  - default wind profile coefficients
  - default vertical potential temperature gradients.

AERMOD allows for simulation of multiple sources (and source types) simultaneously, while making the correct accounting for building downwash and building cavity effects.

In October 2004, the USEPA released an updated Building Profile Input Program (BPIP) that utilizes the **P**lume **Ri**se **M**odel **E**nhancements or "PRIME" algorithms. The BPIPPRM (version 04274) program contains improved plume rise and building downwash algorithms to determine wind direction - dependent building dimensions.

5.2 BUILDING DOWNWASH

The BPIPPRM program builds a mathematical representation of each building to determine Projected building dimensions and its potential zone of influence. These calculations are performed for 36 different wind directions (at 10 degree intervals). For example, the BPIPPRM building dimensions for a wind direction orientation of 30 degrees are used for wind directions between 26 and 35 degrees. If the BPIPPRM program determines that a source is under the influence of several potential building wakes, the structure or combination of structures which has the greatest influence (h_b + 1.5 L_b) will be selected for input to the AERMOD model. Building dimensions will be input to the model for the AMC mill. Figure 5-1 illustrates the mill emission sources in relation to building structures considered in the downwash analysis. Figure 5-2 shows the Project structures relative to the wider AM/NS facility and the existing structures that were included in the cumulative modeling. Table 5-1 summarizes the downwash analysis and associated dominant buildings determined by BPIPPRM. Table 5-2 summarizes all the project structures considered in the downwash analysis.

2 PSD Air Quality Analysis Modeling Guidelines, ADEM, March 2024

Downwash inputs from nearby offsite sources were provided by ADEM and included in the cumulative modeling.

Good Engineering Practice (GEP) stack height analysis was conducted to demonstrate that stack heights comply with USEPA's GEP stack height regulations and will therefore be modeled at their actual height.

TABLE 5-1 DOWNWASH ANALYSIS AS DETERMINED BY BPIP

Source ID	Controlling Structure	Effective Building Height (m)	Maximum Projected Width (m)	Approximate Distance to Stack (m)	5L Distance (m)	GEP Equation Stack Height (m)
COOL_1	ACL1	28.49	338.90	246.20	142.45	70.22
COOL_2	ACL1	28.49	342.28	231.44	142.45	70.22
COOL_3	ACL1	28.49	340.59	215.53	142.45	70.22
COOL_4	ACL1	28.49	343.96	200.49	142.45	70.22
PICKL	ACL1	28.49	157.78	93.24	142.45	70.22
BOIL_1	ACL1	28.49	159.92	225.60	142.45	70.22
BOIL_2	ACL1	28.49	159.92	236.58	142.45	70.22
RTO_1	ACL1	28.49	32.00	0.00	142.45	70.22
RTO_2	ACL1	28.49	127.49	229.09	142.45	70.22
AEAL1	ACL1	28.49	149.18	225.24	142.45	70.22
SPRY_R	ACL1	28.49	337.19	108.22	142.45	70.22
SHOT_B	ACL1	28.49	159.92	172.65	142.45	70.22
CLEAN_1	ACL1	28.49	32.00	0.00	142.45	70.22
CLEAN_2	ACL1	28.49	127.50	28.59	142.45	70.22
CRM_1	ACL1	28.49	298.21	103.75	142.45	70.22
CRM_2	ACL1	28.49	47.71	72.00	142.45	70.22
OXIDE	ACL1	28.49	342.28	97.80	142.45	70.22
TNK_FM	ACL1	28.49	385.29	105.00	142.45	70.22
ACL_C1	ACL1	28.49	32.00	0.00	142.45	70.22
ACL_C2	ACL1	28.49	127.49	25.50	142.45	70.22
QUEN_1	ACL1	28.49	32.00	0.00	142.45	70.22

Source ID	Controlling Structure	Effective Building Height (m)	Maximum Projected Width (m)	Approximate Distance to Stack (m)	5L Distance (m)	GEP Equation Stack Height (m)
QUEN_2	ACL1	28.49	125.31	25.50	142.45	70.22
HYPU_A1	ACL1	28.49	32.00	0.00	142.45	70.22
HYPU_A2	ACL1	28.49	32.00	0.00	142.45	70.22
HYPU_A3	ACL1	28.49	32.00	0.00	142.45	70.22
HYPU_A4	ACL1	28.49	32.00	0.00	142.45	70.22
HYPU_A5	ACL1	28.49	32.00	0.00	142.45	70.22
HYPU_B1	ACL1	28.49	125.31	25.50	142.45	70.22
HYPU_B2	ACL1	28.49	125.31	25.50	142.45	70.22
HYPU_B3	ACL1	28.49	123.13	25.50	142.45	70.22
HYPU_B4	ACL1	28.49	123.12	25.50	142.45	70.22
HYPU_B5	ACL1	28.49	123.12	25.50	142.45	70.22

TABLE 5-2 TABLE OF BUILDINGS ASSOCIATED WITH THE PROJECT

Building ID	Building Tier Height (m)	Building X-Length (m)	Building Y-Length (m)	Reference Corner Coordinate UTM X (m)	Reference Corner Coordinate UTM Y (m)
ACL1	28.49	32.00	515.00	405051.66	3444572.44
ACL2	27.66	32.00	515.00	405101.24	3444547.00
APL	25.79	32.00	515.00	405023.43	3444587.47
INC_CS	19.42	35.50	118.85	405353.59	3444995.54
COIL_S	23.53	33.27	131.00	405102.58	3444507.45
RCM	21.16	28.05	131.00	405089.40	3444482.67
EMUL	20.82	33.27	36.00	404986.91	3444568.94
RCM_R	21.16	28.05	47.97	404973.74	3444544.17

FIGURE 5-1 PROJECT SOURCES AND STRUCTURE LOCATION FOR DOWNWASH ANALYSIS

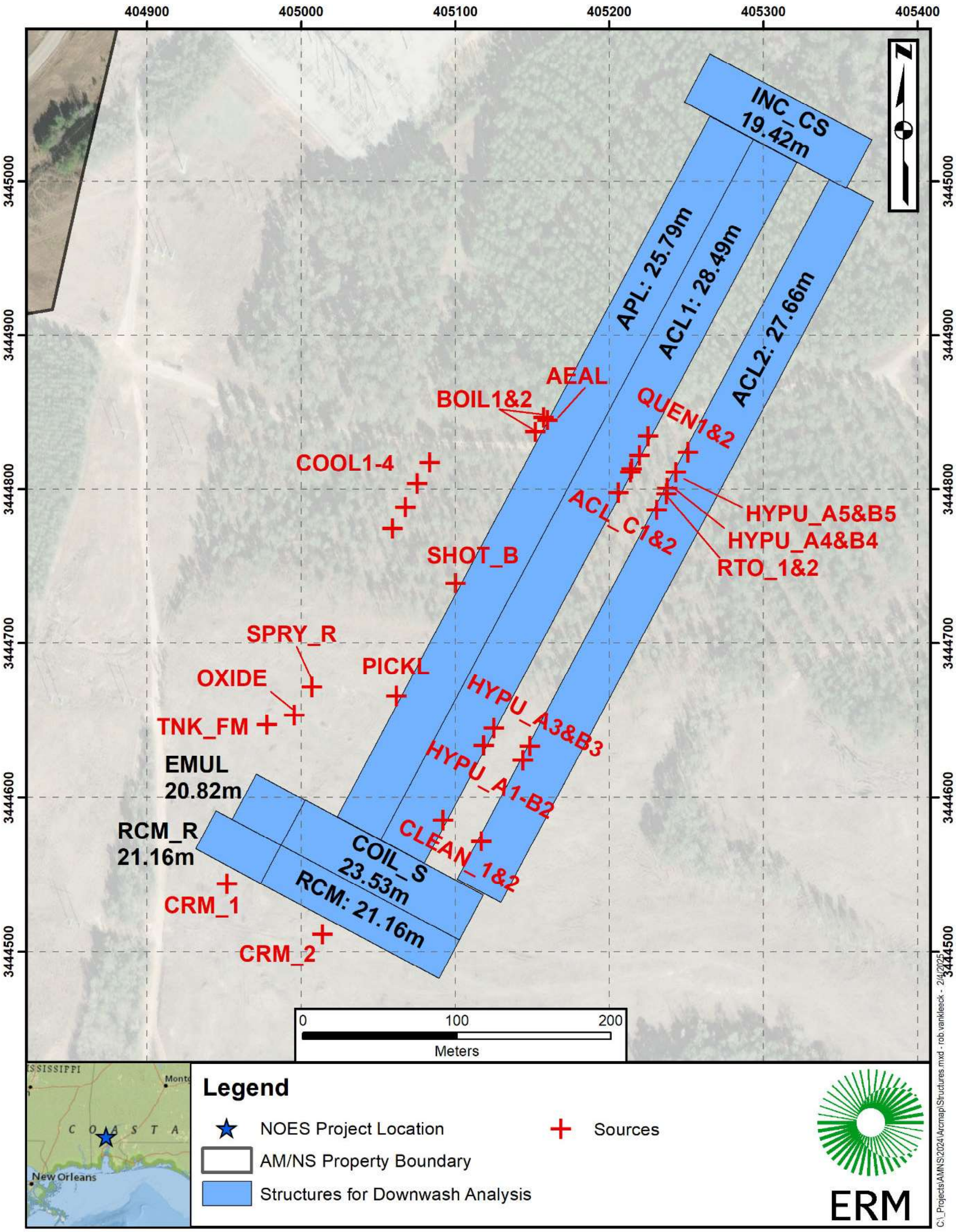
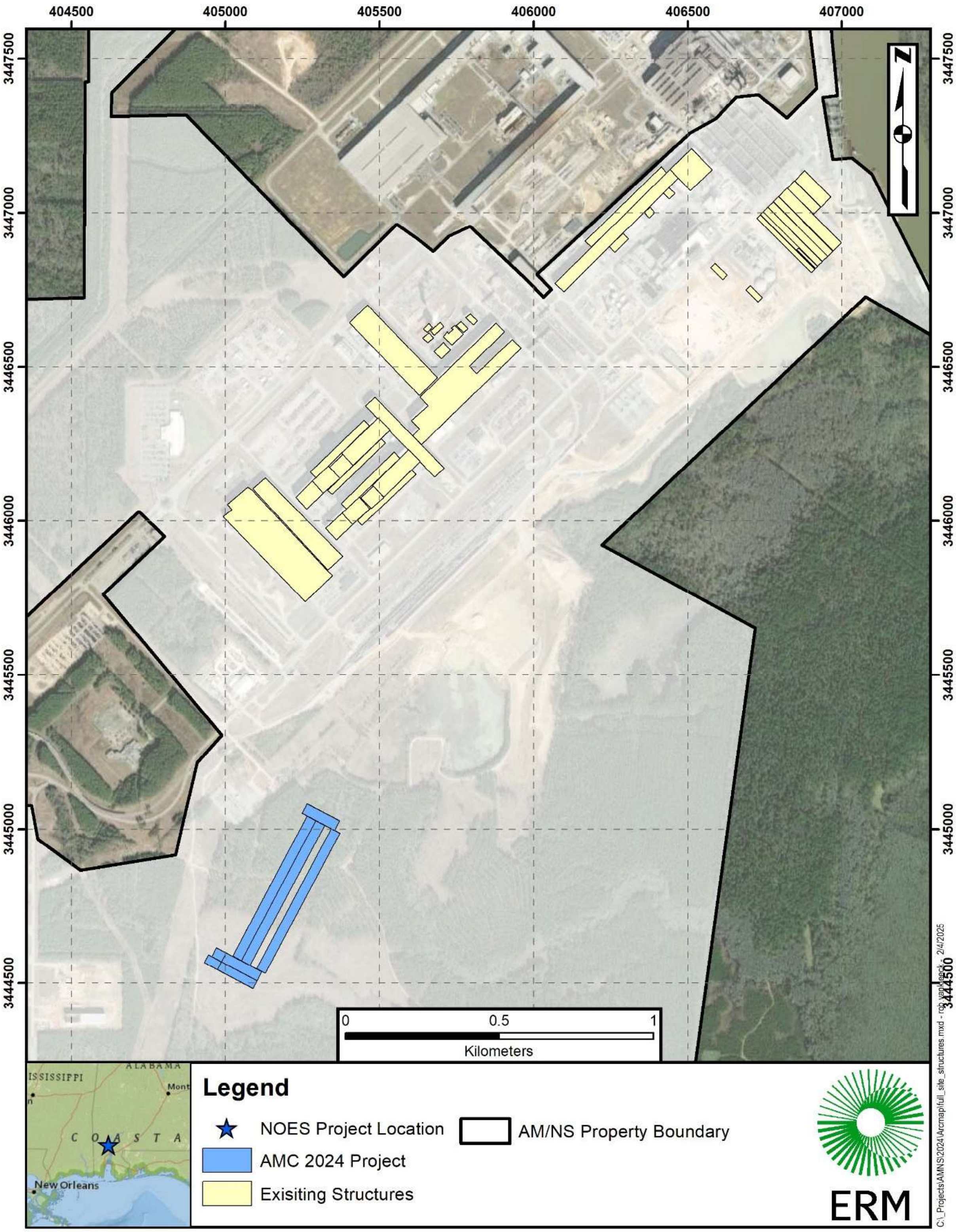


FIGURE 5-2 PROJECT AND EXISITING AM/NS STRUCTURES FOR CUMULATIVE MODELING



5.3 LAND USE

The selection of either rural or urban dispersion coefficients followed the procedures listed in 40 CFR 51 Appendix W Section 7.2.1. The preferred Land Use procedure classifies the land use within a 3-km radius circle around the Project site using the Auer land use type scheme. If the urban Auer land use types I1, I2, C1, R2, and R3 (Industrial, Commercial, and Compact Residential) account for 50 percent or more of the area within 3-km of the site, urban dispersion coefficients should be used. Sources located in areas defined as rural should be modeled using the rural dispersion parameters.

AERSURFACE (version 24142) was used to analyze 2021 NLCD land cover data within 3-km of the Project site; these NLCD data are displayed in Figure 5-3. The NLCD land use categories 23 (Developed, Medium Intensity) and 24 (Developed, High Intensity) are equivalent to the urban Auer land use types. The analysis in Table 5-3 indicates that more than 87 percent of the area around the site is rural. Based on this assessment, the site will be characterized as rural in the modeling.

In addition, inspection of the land use on aerial photo around 3 kilometers around the Project (Figure 5-4) also confirms rural dispersion is appropriate for this Project.

TABLE 5-3 LAND USE ANALYSIS AROUND 3-KM RADIUS OF THE PROJECT

2021 NLCD Category	Description	Area (km^2)	Percent
11	Open Water	0.24	0.84%
21	Developed, Open Space	1.12	3.96%
22	Developed, Low Intensity	1.80	6.36%
23	Developed, Medium Intensity	2.41	8.51%
24	Developed, High Intensity	1.18	4.18%
31	Barren Land (Rock/Sand/Clay)	0.48	1.69%
41	Deciduous Forest	0.07	0.24%
42	Evergreen Forest	10.25	36.24%
43	Mixed Forest	1.23	4.35%
52	Shrub/Scrub	1.16	4.11%
71	Grasslands/Herbaceous	0.59	2.09%
81	Pasture/Hay	0.16	0.57%
90	Woody Wetlands	6.76	23.93%
95	Emergent Herbaceous Wetland	0.83	2.93%
	Total:	28.27	**100.0%**
	Total Rural:	24.69	87.32%
23 + 24	**Total Urban:**	3.59	12.68%

FIGURE 5-3 LAND USE WITHIN 3-KM RADIUS AROUND THE PROJECT SITE

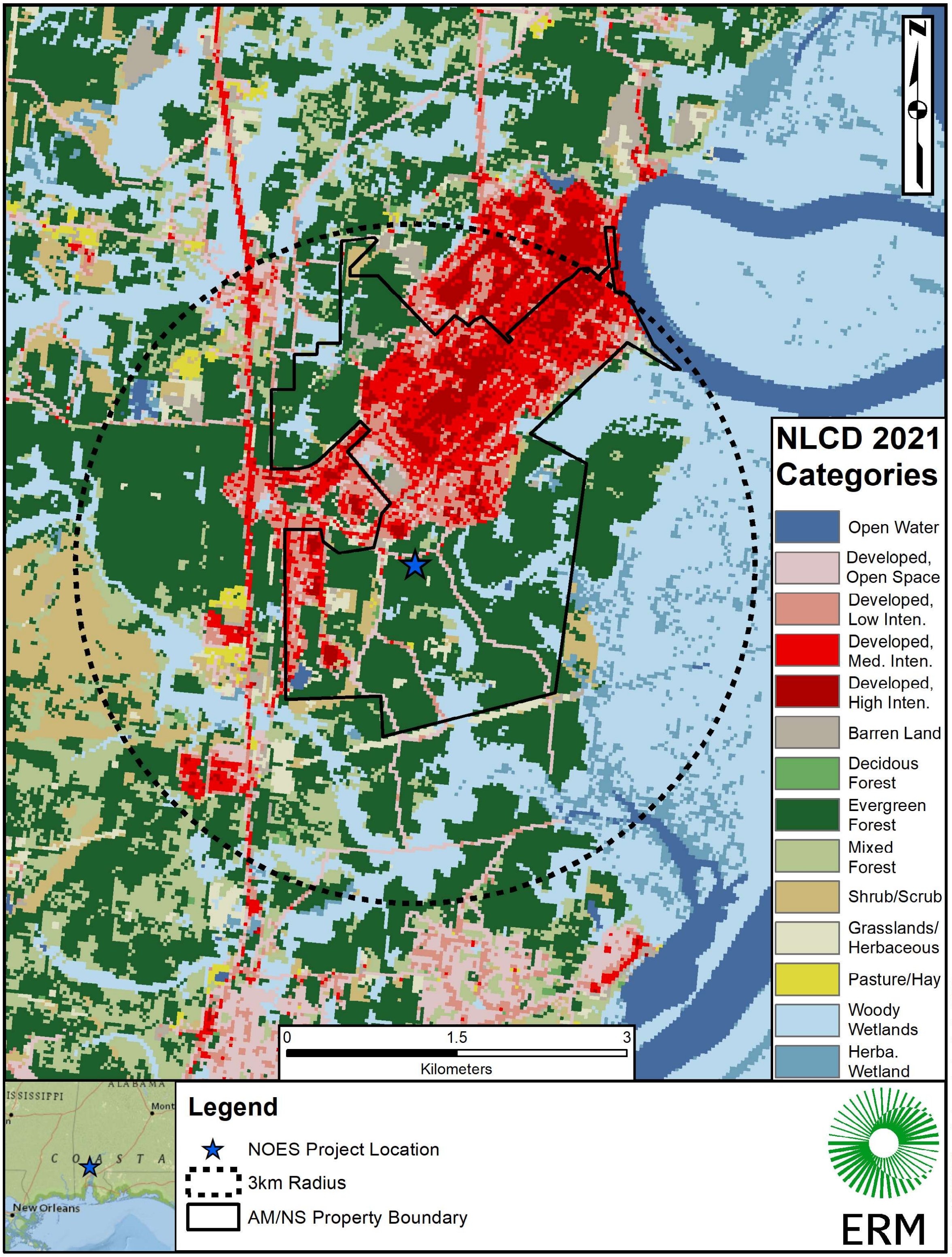
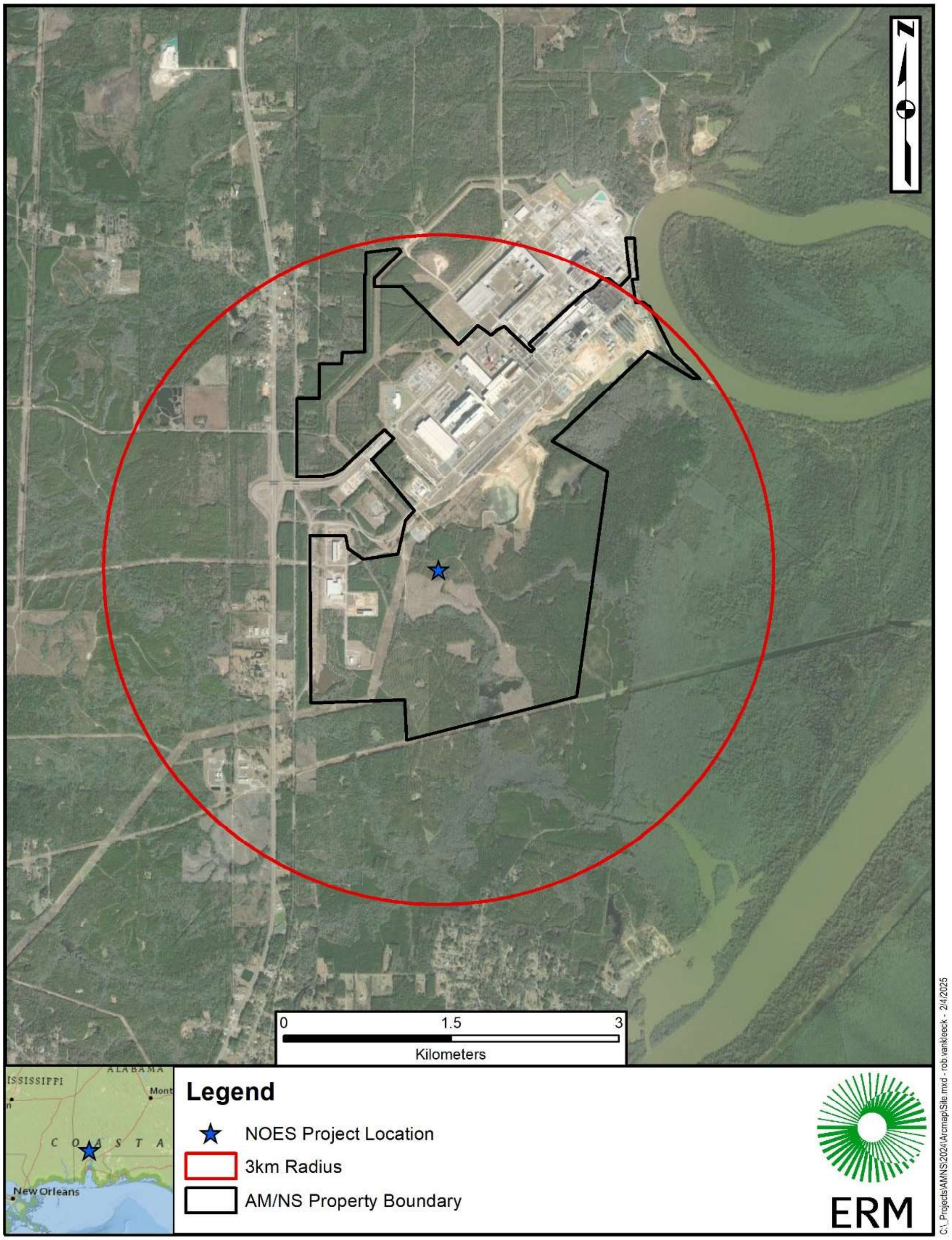


FIGURE 5-4 AERIAL DEPICTING 3-KM RADIUS AROUND THE PROJECT SITE



6. EMISSION INVENTORY DATA

ArcelorMittal Calvert

The proposed Project will have one type of source at the ArcelorMittal Calvert facility: point. The Project's preliminary stack parameters are presented in Table 6-1. For each source, the source ID in the modeling runs is listed, along with any unique characteristics related to the source. Table 6-2 summarizes air emissions of the AMC proposed Project sources in grams per second (g/s), as was used in modeling.

Other Major Emission Sources

Appendix B Table B-1 contains the emissions inventory of the existing mill's sources. Permitted emissions of $PM_{2.5}$ for several existing mill's sources were refined with the most recent 2-year (2022-2023) average emissions to account for actual operations as described in Table 8-2 of the EPA's Appendix W. [3] Appendix B Table B-2 shows emission calculations.

In addition to emissions from the mill, other sources located near the mill have potential to impact concentrations in the vicinity of the mill. These sources were incorporated in the dispersion modeling analyses if they are located within, or have a significant impact on, the proposed modification's significant impact area. ADEM provided the nearby emission inventories for pollutants that have triggered PSD and NAAQS cumulative modeling. The modeling archive contains the provided inventory.

3 82 Fed. Reg. 5,182 (January 17, 2017) https://www.govinfo.gov/content/pkg/FR-2017-01-17/pdf/2016-31747.pdf.

TABLE 6-1 TABLE OF STACK PARAMETERS FOR PROPOSED PROJECT SOURCES

Source ID	Source Description	Release Type	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
COOL_1	Cooling Tower 1	Vertical Point	405083.634	3444817.283	9.14	305.37	12.19	9.14
COOL_2	Cooling Tower 2	Vertical Point	405075.392	3444803.600	9.14	305.37	12.19	9.14
COOL_3	Cooling Tower 3	Vertical Point	405067.830	3444788.310	9.14	305.37	12.19	9.14
COOL_4	Cooling Tower 4	Vertical Point	405059.418	3444774.357	9.14	305.37	12.19	9.14
PICKL	Pickling Line Scrubber	Vertical Point	405062.140	3444665.850	26.82	373.15	10.00	1.20
BOIL_1	Boiler 1	Vertical Point	405157.457	3444846.680	30.00	423.15	16.50	0.81
BOIL_2	Boiler 2	Vertical Point	405152.137	3444837.251	30.00	423.15	16.50	0.81
RTO_1	Curing Oven 1 + RTO 1	Vertical Point	405213.844	3444810.929	29.82	553.15	9.60	0.76
RTO_2	Curing Oven 2 + RTO 2	Vertical Point	405237.208	3444797.153	28.91	553.15	9.60	0.76
AEAL1	Annealing Furnace	Vertical Point	405160.062	3444844.932	37.91	573.15	10.00	2.20
SPRY_R	Spray Roaster	Vertical Point	405007.061	3444671.553	45.72	338.15	5.00	0.50
SHOT_B	Shot Blaster Baghouse	Vertical Point	405100.296	3444739.022	28.91	373.15	10.00	1.30
CLEAN_1	ACL Cleaning Section 1	Vertical Point	405092.173	3444585.243	29.82	348.15	15.00	0.77
CLEAN_2	ACL Cleaning Section 2	Vertical Point	405117.138	3444571.480	28.91	348.15	15.00	0.77
CRM_1	Cold Rolling Mill 1	Vertical Point	404952.030	3444543.735	53.00	293.15	10.50	2.50
CRM_2	Cold Rolling Mill 2	Vertical Point	405014.078	3444511.011	53.00	293.15	10.50	2.50
OXIDE	Iron Oxide Bins w/ Bagfilters	Vertical Point	404995.766	3444653.387	30.48	358.15	19.69	0.36
TNK_FM	Tank Farm Scrubber	Vertical Point	404978.066	3444647.215	24.99	353.15	25.69	0.56

Source ID	Source Description	Release Type	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
ACL_C1	ACL Cooling Section 1	Vertical Point	405206.130	3444797.930	27.91	353.15	14.81	0.69
ACL_C2	ACL Cooling Section 2	Vertical Point	405230.903	3444786.778	27.91	353.15	14.81	0.69
QUEN_1	Quenching Line 1	Vertical Point	405225.360	3444834.500	27.91	329.15	14.03	2.1
QUEN_2	Quenching Line 2	Vertical Point	405251.123	3444824.078	27.91	329.15	14.03	2.1
HYPU_A1	Hydrogen Purging #1, Line 1	Vertical Point	405118.760	3444633.770	27.91	623.15	19.49	0.38
HYPU_A2	Hydrogen Purging #2, Line 1	Vertical Point	405118.760	3444633.770	27.91	623.15	19.49	0.38
HYPU_A3	Hydrogen Purging #3, Line 1	Vertical Point	405125.160	3444644.840	27.91	623.15	19.49	0.38
HYPU_A4	Hydrogen Purging #4, Line 1	Vertical Point	405214.587	3444813.424	27.91	623.15	19.49	0.38
HYPU_A5	Hydrogen Purging #5, Line 1	Vertical Point	405219.654	3444821.998	27.91	623.15	19.49	0.38
HYPU_B1	Hydrogen Purging #1, Line 2	Vertical Point	405144.152	3444624.022	27.91	623.15	19.49	0.38
HYPU_B2	Hydrogen Purging #2, Line 2	Vertical Point	405144.152	3444624.022	27.91	623.15	19.49	0.38
HYPU_B3	Hydrogen Purging #3, Line 2	Vertical Point	405148.581	3444633.127	27.91	623.15	19.49	0.38
HYPU_B4	Hydrogen Purging #4, Line 2	Vertical Point	405237.761	3444800.620	27.91	623.15	19.49	0.38
HYPU_B5	Hydrogen Purging #5, Line 2	Vertical Point	405243.429	3444811.066	27.91	623.15	19.49	0.38

TABLE 6-2 TABLE OF EMISSIONS FOR PROPOSED PROJECT SOURCES

Source ID	Source Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_x (g/s)
COOL_1	Cooling Tower 1	1.518E-03	5.103E-06	0.000E+00
COOL_2	Cooling Tower 2	1.518E-03	5.103E-06	0.000E+00
COOL_3	Cooling Tower 3	1.518E-03	5.103E-06	0.000E+00
COOL_4	Cooling Tower 4	1.518E-03	5.103E-06	0.000E+00
PICKL	Pickling Line Scrubber	4.450E-02	3.900E-02	0.000E+00
BOIL_1	Boiler 1	4.272E-02	4.272E-02	2.064E-01
BOIL_2	Boiler 2	4.272E-02	4.272E-02	2.064E-01
RTO_1	Curing Oven 1 + RTO 1	1.303E-02	1.303E-02	1.455E-01
RTO_2	Curing Oven 2 + RTO 2	1.303E-02	1.303E-02	1.455E-01
AEAL1	Annealing Furnace	8.850E-02	8.850E-02	5.900E-01
SPRY_R	Spray Roaster	8.889E-03	8.889E-03	8.889E-02
SHOT_B	Shot Blaster Baghouse	1.214E-02	1.214E-03	0.000E+00
CLEAN_1	ACL Cleaning Section 1	4.767E-02	4.767E-02	0.000E+00
CLEAN_2	ACL Cleaning Section 2	4.767E-02	4.767E-02	0.000E+00
CRM_1	Cold Rolling Mill 1	2.887E-01	1.877E-01	0.000E+00
CRM_2	Cold Rolling Mill 2	2.887E-01	1.877E-01	0.000E+00
OXIDE	Iron Oxide Bins w/ Bagfilters	3.886E-02	3.760E-02	0.000E+00
TNK_FM	Tank Farm Scrubber	2.598E-02	2.539E-02	0.000E+00
ACL_C1	ACL Cooling Section 1	4.599E-02	4.599E-02	0.000E+00
ACL_C2	ACL Cooling Section 2	4.599E-02	4.599E-02	0.000E+00
QUEN_1	Quenching Line 1	1.326E-02	4.975E-05	0.000E+00
QUEN_2	Quenching Line 2	1.326E-02	4.975E-05	0.000E+00
HYPU_A1	Hydrogen Purging #1, Line 1	0.000E+00	0.000E+00	2.762E-02
HYPU_A2	Hydrogen Purging #2, Line 1	0.000E+00	0.000E+00	4.603E-02
HYPU_A3	Hydrogen Purging #3, Line 1	0.000E+00	0.000E+00	4.603E-02
HYPU_A4	Hydrogen Purging #4, Line 1	0.000E+00	0.000E+00	4.603E-02

Source ID	Source Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_x (g/s)
HYPU_A5	Hydrogen Purging #5, Line 1	0.000E+00	0.000E+00	4.603E-02
HYPU_B1	Hydrogen Purging #1, Line 2	0.000E+00	0.000E+00	2.762E-02
HYPU_B2	Hydrogen Purging #2, Line 2	0.000E+00	0.000E+00	4.603E-02
HYPU_B3	Hydrogen Purging #3, Line 2	0.000E+00	0.000E+00	4.603E-02
HYPU_B4	Hydrogen Purging #4, Line 2	0.000E+00	0.000E+00	4.603E-02
HYPU_B5	Hydrogen Purging #5, Line 2	0.000E+00	0.000E+00	4.603E-02

7. METEOROLOGICAL DATA

Guidance for air quality modeling recommends the use of one year of onsite meteorological data or five years of representative off-site meteorological data. Since onsite data are not available for the facility, meteorological data from the National Weather Service (NWS) was used in this analysis.

AMC proposes to utilize the latest five years (2019-2023) of pre-processed meteorological data from Mobile Regional Airport NWS station (WBAN 13894) and concurrent upper air data from the Slidell, Louisiana NWS station (WBAN 53813) as the source of representative meteorological data in the air quality modeling analysis. These stations correspond to the representative NWS data for Mobile and Washington counties in Appendix B of ADEM's May 2024 PSD Air Quality Analysis Modeling Guidelines. The airport is located about 55 kilometers southwest of the facility. The pre-processed, hourly NWS data, including the low wind speed option (Adjusted U*), was obtained from the ADEM Air Division, which was processed by ADEM with the latest AERMET version 24142. Figure 7-1 presents the cumulative annual frequency wind rose.

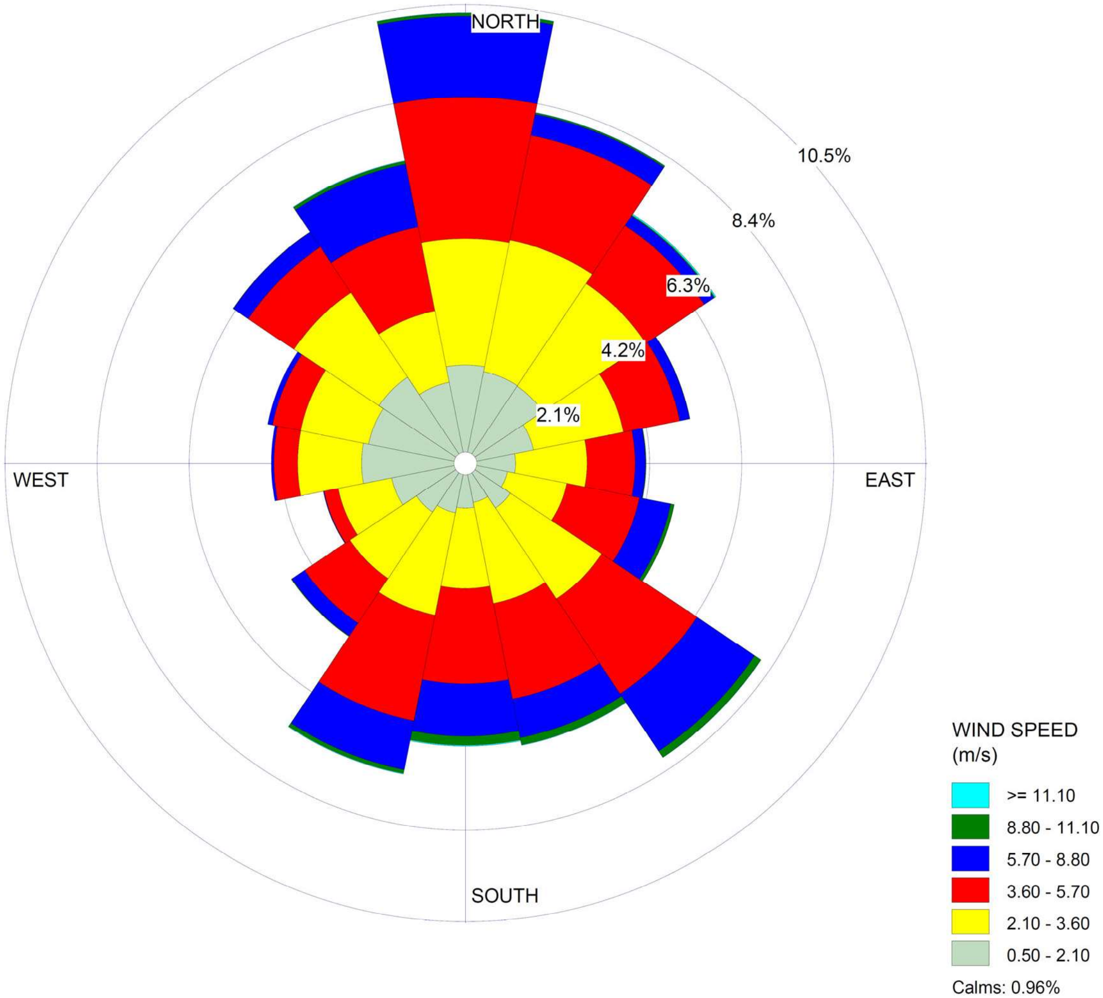
ADEM Air Division processed meteorological data using AERMET includes key components listed in the "Mobile Readme" word document. Specifically, ADEM used the EPA recommended method to determine the applicable Bowen Ratio moisture tables for each year, which corresponds to dry in 2020 and 2023, average in 2019 and 2022, and wet in 2021. AERSURFACE surface characteristics assigned by ADEM are outlined below:

- Late autumn after frost and harvest, or winter with no snow – December, January, February.
- Transitional spring – March, April, May
- Midsummer with lush vegetation – June, July, August, September
- Autumn with unharvested cropland – October, November

AERMINUTE (version 15272) was used to generate hourly averaged wind speeds and wind directions to supplement the standard hourly ASOS observations. The hourly averaged wind speed and direction generated by the AERMINUTE program was merged with data from standard surface archives, along with upper air in Stage 2 of AERMET processing. THRESH_1MIN keyword was used in Stage 2 to specify a 0.5 m/s threshold wind speed for the 1-minute data. This threshold value only applies to the hourly averaged winds derived from 1-minute data and does not apply to the standard hourly NWS weather observations.

FIGURE 7-1 5 YEAR (2019-2023) WIND ROSE FOR MOBILE AIRPORT, AL

WIND ROSE PLOT:	DISPLAY:
5-Year Wind Rose for Mobile Airport 2019 - 2023	**Wind Speed Direction (blowing from)**



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2019 - 00:00 **End Date: 12/31/2023 - 23:59**	MODELER: **Robert Van Kleeck**	
	CALM WINDS: **0.96%**	TOTAL COUNT: **43515 hrs.**	
	AVG. WIND SPEED: **3.40 m/s**	DATE: **12/13/2024**	PROJECT NO.:

8. RECEPTOR GRID AND RESTRICTED ACCESS

The initial significant impact analyses was performed using a receptor grid extending out to 20 km (consisting of 13,202 receptors). The receptor assignments are as follows:

1. 100-meter (m) spacing along the mill fence line;
2. 100-m spacing fence line to 5,000 m;
3. 250-m spacing from 5,000 m to 7,000 m;
4. 500-m spacing from 7,000 m to 10,000 m; and
5. 1,000-m spacing from 10,000 m to 20,000 m.

Figures 8-1 and 8-2 show the near-field and the far-field for the 20 km receptor grid. Receptor elevations were assigned using the USEPA's AERMAP software tool (version 24142), which is designed to extract elevations from USGS National Elevation Dataset (NED) data at 1/3 arc-second (approximately 10 m) resolution in GeoTIFF format. AERMAP, the terrain preprocessor for AERMOD, uses interpolation procedures to assign elevations to a receptor. Base elevations for mill buildings and emission sources are based on information provided by ArcelorMittal Calvert. For any cases in which high gradients of concentrations occur within a nearby inventory facility's fence line, AMC will split the receptor grid to exclude the emission impacts from the culpable inventory facility from within their own fence line. As per ADEM guidance, for the cumulative modeling runs, all maximum impacts were resolved within a 100 meter receptor spacing with receptors added if the predicted maxima occurs beyond 5 km. For SIL modeling, Tables 10-1 and 10-2 and Appendix A figures demonstrates that all applicable pollutants and averaging periods maximum impacts occur within the 100 meter receptor spacing at the facility's fence line. Additionally, all applicable pollutants' and averaging periods' ground level concentrations are decreasing towards the edge of the modeling domain.

In accordance with the U.S. EPA draft guidance *Revised Policy on Exclusions from "Ambient Air"*, video surveillance, monitoring, routine security patrols and clear signage may adequately preclude public access.[4] AMC respectfully requests consideration of this provision given the facility layout and shared infrastructure with its neighbor, Outokumpu Stainless USA, LLC (Outokumpu). The following procedures describe the security protocols for AM/NS, which AMC resides within. AMC will rely on the Security Services of AM/NS.

AM/NS, is situated on approximately 2,000 acres and is bordered to the south by timberland, wetlands, and a natural gas utility corridor. The facility is bordered to the east by the Tombigbee River and to the west by the Norfolk Southern rail mainline. AM/NS shares a property boundary to the north with neighboring facility, Outokumpu, and shares infrastructure such as utilities, river terminal facilities and AM/NS processes slabs for Outokumpu. Outokumpu manages security separately from AM/NS through a security access point from the north of their property (Paul Bayou Road). For AM/NS, security is managed by the Fire Department which also provides first response services to Outokumpu and therefore must be able to quickly traverse between the common property boundary unimpeded. Since there are several shared utilities and infrastructure

4 U.S. Environmental Protection Agency, *Revised Policy on Exclusions from "Ambient Air"* December, 2019

as well as the placement of buildings and roads, a fence line along the northern boundary between the two facilities is not practical. To assist with security, signage depicting the property boundary demarcation including the wording "authorized personnel only" are located at each road crossing of the common property boundary.

The AM/NS Fire/Security Department provides continuous video monitoring (noted by the green video camera icon in Figure 8-3) and has posted clearly visible signage (Authorized Personnel Only). These security measures are employed along all interior perimeter areas in which the two companies have shared areas of travel. Authorized Outokumpu traffic allowed on the AM/NS site includes semi-trucks that pass through the radiation portal and/or weight scales located near the AM/NS Dispatch Building which is highlighted in blue in Figure 8-3.

The River Terminal common area for AM/NS and Outokumpu includes a road that connects to the site via 26th Street which is highlighted in green in Figure 8-3. AM/NS employees, Outokumpu employees, and contractors are permitted in this area. This common area is continuously monitored/recorded by AM/NS Fire/Security Department personnel.
The AM/NS Fire/Security Department:

- Conducts four patrols daily of the interior perimeter of the AM/NS site.
- Conducts an exterior perimeter patrol once a week to ensure security of the facility and inspect. all fencing and clearly visible Authorized Personnel Only signage.
- Conducts fire suppression inspections daily on both the AM/NS and Outokumpu sites.
- Provides Emergency Services for AM/NS and Outokumpu.

In accordance with the U.S. EPA guidance on the Revised Policy on Exclusions from "Ambient Air,"[4] AM/NS Calvert employs a combination of physical fencing, video surveillance, monitoring, routine security patrols, and clear signage to effectively restrict public access. Figure 8-4 illustrates the property boundary and highlights the various means of access control, excluding video surveillance.

The facility was originally built by ThyssenKrupp and included both carbon and stainless-steel operations. The stainless-steel business was later divested to Outokumpu, and AM/NS subsequently acquired the carbon steel assets. As the two companies share the site, AM/NS Calvert has posted signage clearly marking its property and restricting access to authorized personnel only. This area is depicted by a blue line, starting at the Tombigbee River, and extending southwest, where it connects to the physical fence at the entrance to Outokumpu's security gate. The perimeters marked in red indicate locations where AM/NS Calvert uses physical fencing to prevent public access. The Tombigbee River itself serves as a natural barrier to public access, with two marine docks where operational activities occur around the clock, 365 days a year. Additionally, the riverbanks are steep and tall, creating an additional natural deterrent along the undeveloped areas adjacent to the river. The area highlighted in green represents zones where a combination of signage and natural barriers, such as wetlands, effectively restricts public access along the property boundary.

AM/NS Calvert's Second Street, highlighted in yellow, is a privately owned road that provides access to the Alabama Industrial Development Training (AIDT) Building and AM/NS Calvert's Industrial Park. Unlike other areas of the facility, entry through a guard gate is not required. However, the street and surrounding properties are clearly posted with signage prohibiting public access, and the area is monitored by security cameras and regular patrols. Plans are underway to enhance security along Second Street by installing additional controlled access points, which will be completed prior to the start-up of the NOES mill.

FIGURE 8-1 FAR FIELD AERMOD RECEPTOR GRID

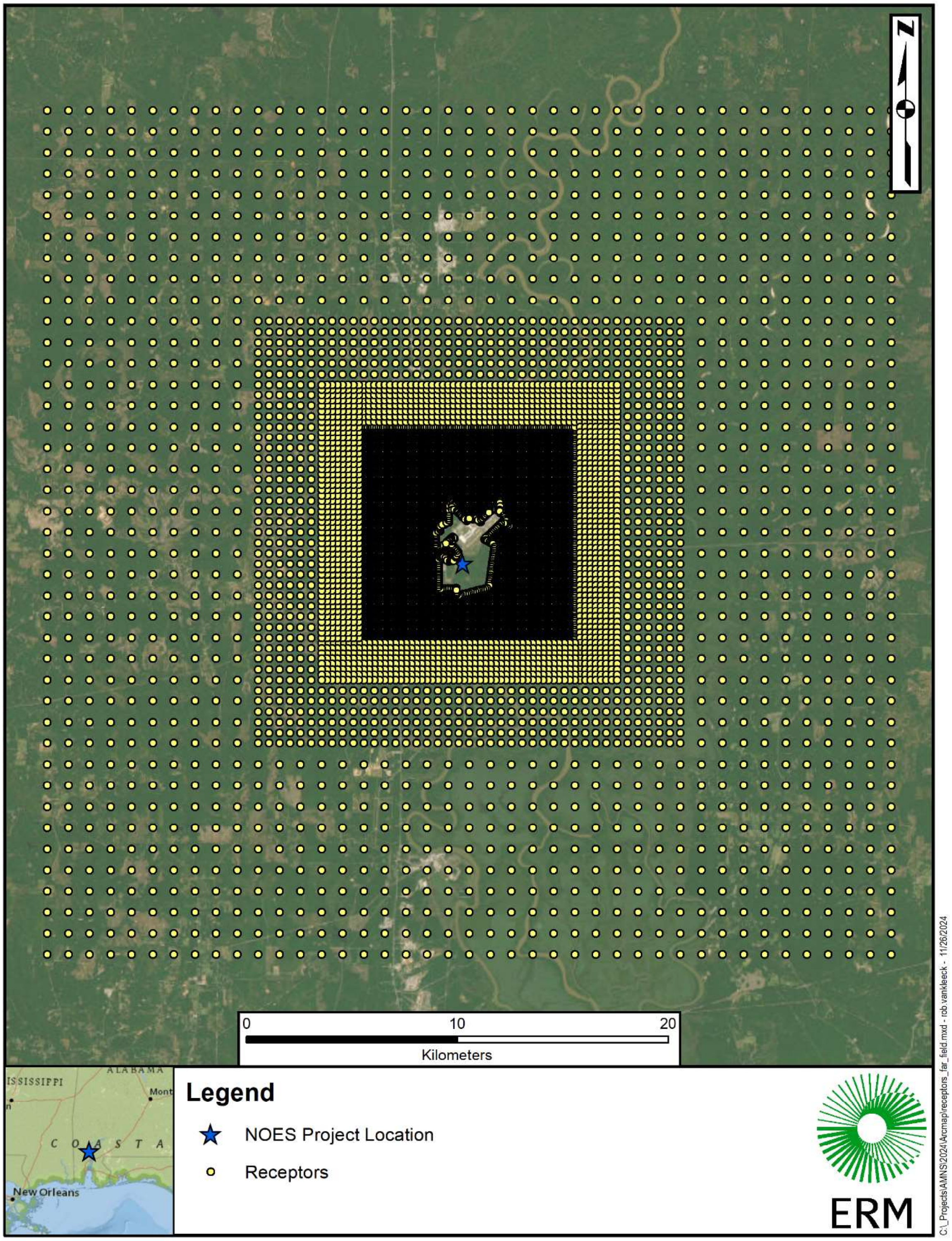


FIGURE 8-2 NEAR-FIELD AERMOD RECEPTOR GRID

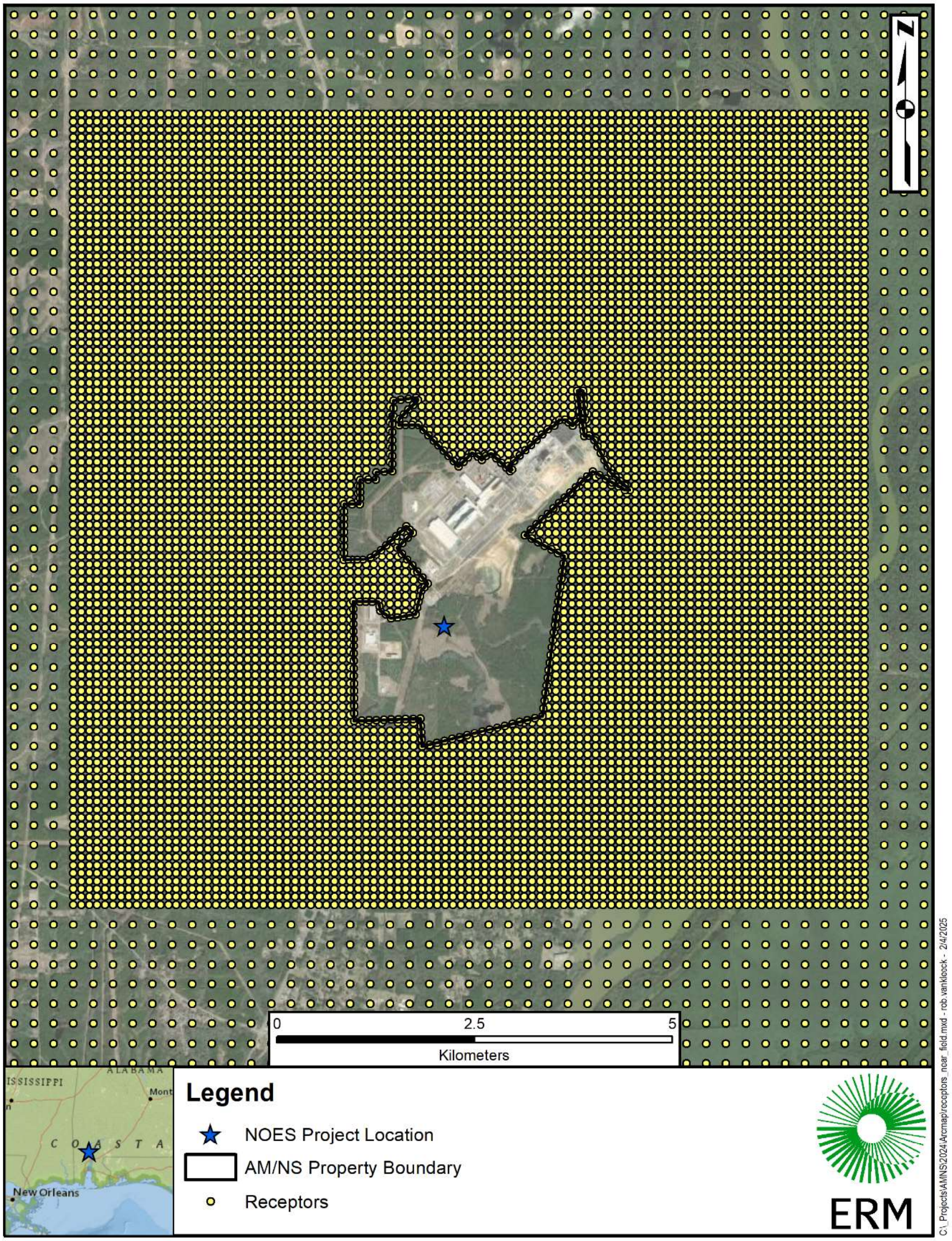
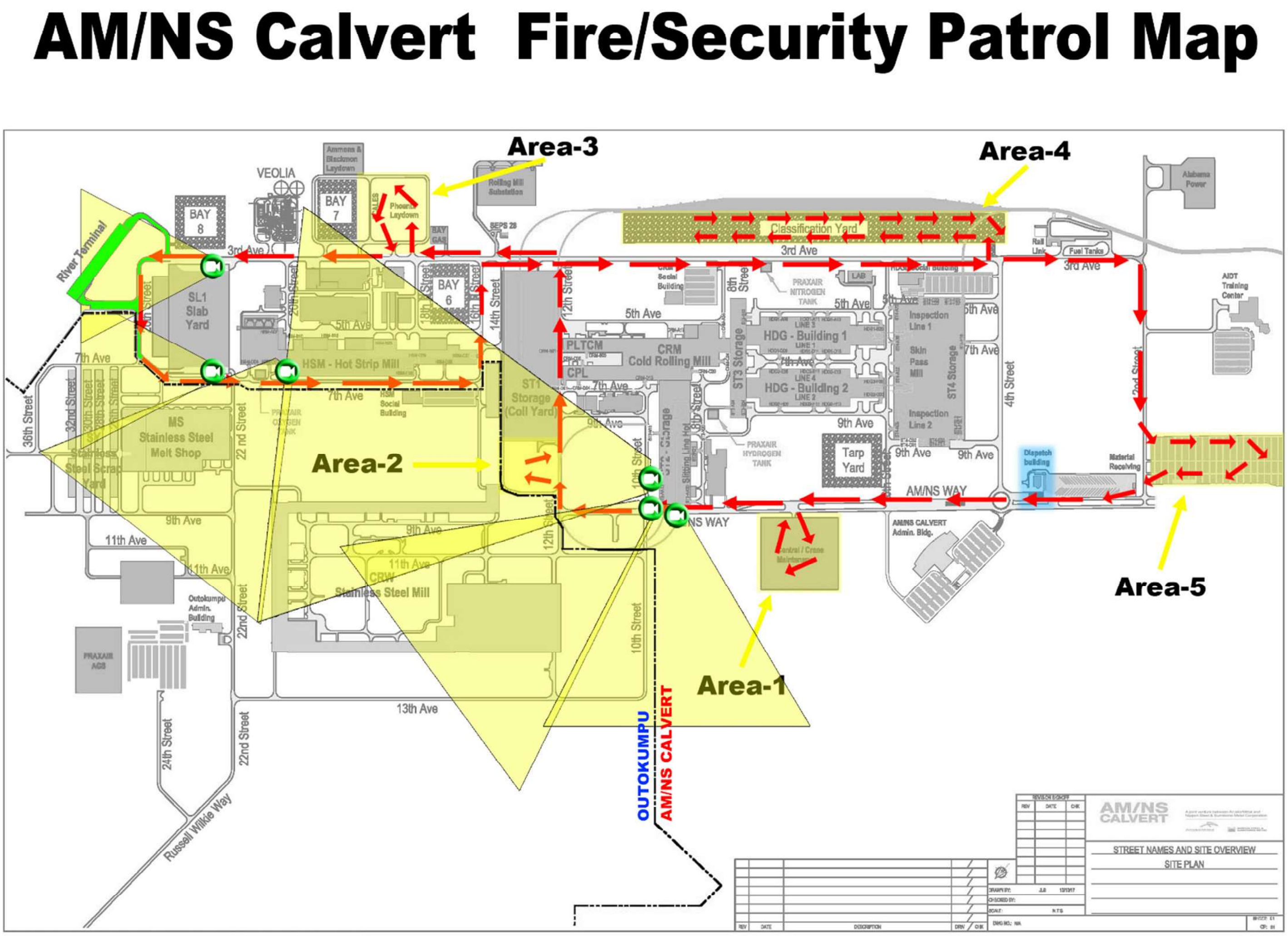
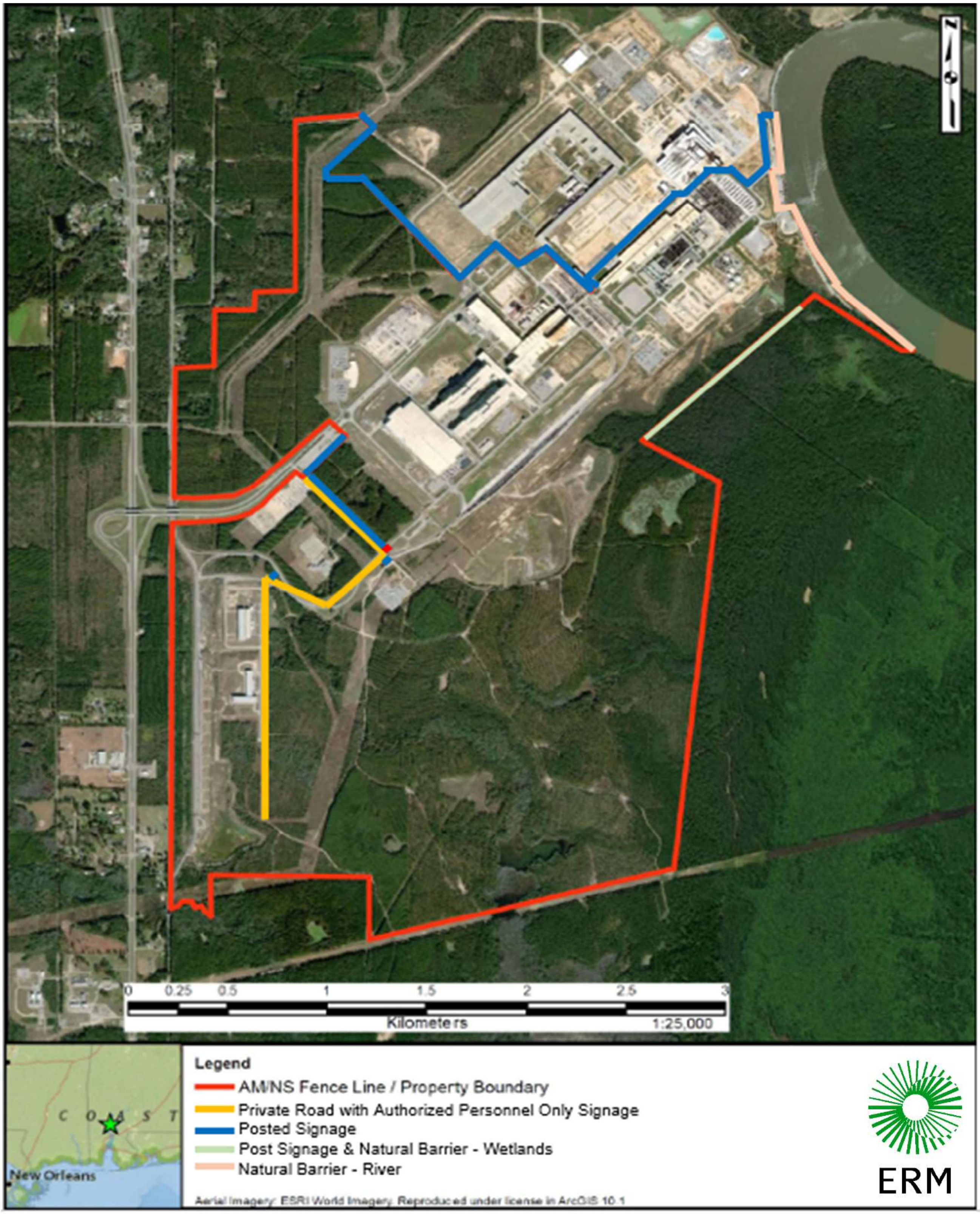


FIGURE 8-3 AM/NS PATROL MAP



Note: North is towards the lower left corner

FIGURE 8-4 AM/NS CALVERT RESTRICTED ACCESS BOUNDARY



9. AMBIENT BACKGROUND CONCENTRATIONS

Representative background concentrations were added to the maximum predicted concentrations due to major emission sources for comparison with the national ambient air quality standards. The proposed background concentrations have been provided by ADEM [5] and are listed in Table 9-1.

TABLE 9-1 MONITORED DESIGN VALUES

Pollutant	Monitoring Station	Averaging Period	Monitored Design Value (µg/m³)	Years
NO_2	Yorkville, GA	1-hour	31	2013-2015
NO_2	Yorkville, GA	Annual	7.5	2013-2015
PM_{10}	Montgomery	24-hour	24	2021-2023
$PM_{2.5}$	Sumter	24-hour	16	2021-2023
$PM_{2.5}$	Sumter	Annual	6.2	2021-2023

5 Correspondence between ERM (Jared Williams) and ADEM (Jackson Rogers), May 17, 2024.

10. AMBIENT AIR QUALITY IMPACT ANALYSIS

The ambient air quality impact from the proposed modification and existing emission sources was assessed by performing the following dispersion modeling analyses:

- Determine whether the proposed modification has a significant air quality impact for each pollutant subject to PSD review;
- Demonstrate compliance with the PSD increments; and
- Demonstrate compliance with the NAAQS.

These analyses were performed using the 5-year meteorological database for 2019-2023 for the Mobile Regional Airport as described in Section 7.

10.1 NO_X TO NO_2 CONVERSION

For NO_2 modeling, AMC used the regulatory default Tier 2 Ambient Ratio Method 2 (ARM2) option with the default minimum and maximum NO_2/NO_X ratios of 0.5 and 0.9 to calculate conversion of NO_X to NO_2.

10.2 DETERMINATION OF SIGNIFICANT IMPACT AREAS

The significant impact area (SIA) is defined as the area in which predicted concentrations, due to the proposed modification, exceed specified significant impact levels (SILs) on a pollutant-specific basis.

The SIL modeling results are presented in Table 10-1. Appendix A shows the contour plots and SIAs. The peak concentrations for NO_2 and PM_{25} for all averaging periods exceed their respective SILs with the peak concentrations occurring on the fenceline with 100-meters resolution, and concentrations decreasing towards the edge of the grid.

TABLE 10-1 SIL MODELING RESULTS

Pollutant	Averaging Period	SIL (μg/m³)	SMC (μg/m³)	Model-Predicted Peak Conc. (μg/m³)	% of the SIL	SIA [1] (km)	Location of Peak Conc.
NO_2	1-hour	7.5	N/A	45.29	604%	10.63	AM/NS property boundary, 100-m spacing
	Annual	1	14	1.92	192%	0.75	AM/NS property boundary, 100-m spacing
PM_{10}	24-hour	5	10	4.69	94%	N/A	AM/NS property boundary, 100-m spacing
	Annual	1	N/A	1.08	108%	0.35	AM/NS property boundary, 100-m spacing
$PM_{2.5}$ (with secondary)	24-hour	1.2	N/A	3.59[2]	299%	2.09	AM/NS property boundary, 100-m spacing
	Annual	0.13	N/A	0.78[2]	601%	2.09	AM/NS property boundary, 100-m spacing

(1) The SIA center point is based on UTM X=405129.82 meters and UTM Y = 3444724.8 meters, UTM Zone 16, NAD83.
(2) $PM_{2.5}$ 24-hour secondary: 0.025 (μg/m³), $PM_{2.5}$ Annual secondary: 0.001 (μg/m³). These values were added to the primary 24-hour and annual $PM_{2.5}$ modeling results, respectively. The calculations for these values are shown in Section 10.5.

Exceedances of the SIL triggers cumulative NAAQS and PSD increment analyses within the SIA. The NAAQS and PSD Increment analyses were carried out by modeling all receptors at which the Project exceeds the respective SILs. Because the 24-hour and annual $PM_{2.5}$ SIAs were so similar, the significance grid used for $PM_{2.5}$ considers receptors over either SIL. For NAAQS analyses, impacts due to off-site sources, existing AM/NS sources, as well as ambient air monitored background concentrations were added to modeled concentrations for comparison with the NAAQS. For the PSD Increment, for each pollutant for which a baseline has been triggered, consuming and expanding offsite inventory sources were added and credited, respectively to the Project's impacts. Existing AM/NS increment consuming sources were also included.

10.3 SIGNIFICANT MONITORING CONCENTRATIONS

The maximum concentrations from the Project were compared against the applicable monitoring *de minimis* concentration or SMC, as shown in Table 10-1. They indicate that annual NO_2 and 24-hour PM_{10} are less their respective SMCs.

A preconstruction ambient air monitoring waiver must be requested in order for a facility subject to PSD review to be exempt from preconstruction ambient air monitoring requirements. A waiver may be considered based on the modeled impacts of the Project when compared to the SMCs in 40 CFR 52.21. If a Project cannot be exempted from preconstruction monitoring based on modeling results, the applicant may propose the use of existing monitoring data if appropriate justification is provided. As presented in Table 9-1, ADEM has provided representative regional background data from nearby monitoring sites for all applicable pollutants.

10.4 CUMULATIVE MODELING

This section describes the methodology and results for all triggered cumulative impacts analyses. For NAAQS, this includes 1-hour and annual NO_2, along with 24-hour/annual $PM_{2.5}$. For PSD Increment, this includes annual NO_2, 24-hour and annual $PM_{2.5}$, and annual PM_{10}.

10.4.1 NAAQS ASSESSMENT

The NAAQS design values for each of the criteria pollutant and averaging periods (based on ranks listed in the footnotes of Table 4-1) includes the design background concentrations (listed in Table 9-1), non-Project facility and off-site impacts (provided by ADEM).

Modeling was performed using pollutant and averaging period specific receptor grids that included only receptors that were over the respective SIL. The NAAQS is exceeded when the total concentration at a specific time and location is above the NAAQS. If the NAAQS is exceeded, a significance test is then performed to assess if the Project causes or contributes to the exceedance. The threshold for assessing a significant contribution of an exceedance to the NAAQS is whether the Project contribution is greater than the SIL. Table 10-2 shows the results of these NAAQS analyses. $PM_{2.5}$ was below their respective thresholds for each averaging period and hence showed compliance with the NAAQS.

The NO_2 NAAQS modeling indicated a concentration equal to 1,748.97 µg/m^3 for 1-hour average and 198.70 µg/m^3 for annual average. Such high concentrations are the result of having receptors on top of the nearby Florida Gas utility company sources (Facility ID 3028). To address these unrealistic predictions near the offsite sources, their contributions can be excluded within the property boundary of the offsite facility. Therefore, the NO_2 NAAQS runs were separated into two groups; one with receptors on the offsite facility's property without contribution from the co-located sources, and the other excludes those same receptors but includes the facility's emissions. The receptors that fall inside the property were excluded from the second run as the property was clearly visible from satellite imagery. Only the highest resulting concentrations from both runs is presented in Table 10-2. The annual NO_2 NAAQS exceedance of 198.70 µg/m^3 was resolved with the refinements described above, resulting in 93.48 µg/m^3, 93% of the NAAQS. However, the 1-hour NO_2 NAAQS was still exceeded, at 1,569.74 µg/m^3 and equal to 835% of the NAAQS. The 1-hour NO_2 exceedances were around the Florida Gas utility company.

A culpability modeling analysis was conducted on the exceeding receptors with the MAXDCONT output file, written out to the 50th ranking, indicated that the Project does not significantly contribute to any of the modeled NAAQS exceedances. The largest contribution from the Project is

7.38 µg/m³ at the 22nd rank. Therefore, the Project is in compliance with the 1-hour NO_2 NAAQS. All maximum predicted concentrations occur on the 100-meter spaced grid.

TABLE 10-2 NAAQS MODELING RESULTS

Pollutant	Averaging Period	NAAQS (µg/m³)	Model-Predicted Peak Conc. (µg/m³)	Ambient Background (µg/m³)	Total Conc. (µg/m³)	% Of the NAAQS	Location of Peak Conc.
NO_2	1-hour	188	1,538.74(2)	31	1,569.74 (2)	835%(2)	100m spacing near offsite facility
	Annual	100	85.98	7.5	93.48	93%	
$PM_{2.5}$ (with secondary)	24-hour	35	15.94(1)	16	31.94	91%	AM/NS property boundary, 100 m spacing
	Annual	9	2.49(1)	6.2	8.69	97%	

(1) $PM_{2.5}$ 24-hour project secondary: 0.025 (µg/m³), $PM_{2.5}$ Annual project secondary: 0.001 (µg/m³). $PM_{2.5}$ 24-hour offsite NAAQS secondary: 7.79 (µg/m³). $PM_{2.5}$ Annual offsite secondary: 0.43 (µg/m³). These values were added to the primary 24-hour and annual $PM_{2.5}$ modeling results, respectively. The calculations for the project secondary values are shown in Section 10.5.
(2) The Project does not significantly contribute to the NAAQS violations. The maximum Project impacts on the periods and receptors where the NAAQS is violated is equal to 7.38 µg/m³.

10.4.2 PSD INCREMENT ASSESSMENT

A Class II PSD increment modeling analysis was performed for 24-hour and annual $PM_{2.5}$, annual PM_{10}, and annual NO_2. For the PSD increment assessment, no ambient background is added as the threshold applies only to the change in ambient concentrations that have occurred since the baseline date was established. For the criteria pollutants triggering cumulative modeling the most recent major source baseline date for $PM_{2.5}$ is October 20, 2010. Based on an AM/NS Title V Application submitted June 8, 2011, initial operation of the facility commenced in June 2010. Most of the existing facility sources were thus excluded the $PM_{2.5}$ PSD increment modeling. The table in Appendix B of the existing AM/NS sources notes the specific sources that were added after the $PM_{2.5}$ baseline date. For the other triggered PSD increment criteria pollutant runs, all the facility sources were included as their major source baseline dates were prior to June 2010. The nearby offsite inventory sources (provided by ADEM) have been categorized to account for whether a source was constructed after the baseline date (consuming sources). Sources that have been retired since the baseline date (expanding sources) were modeled with negative emissions in AERMOD to take credit for the reductions that have occurred after the baseline date). Table 10-3 summarizes the results of the PSD increment assessment. The results indicates that emissions from the Project, when assessed with other increment consuming and expanding sources, are in compliance with the PSD increments. All maximum predicted concentrations occur on the 100-meter spaced grid.

TABLE 10-3 PSD INCREMENT MODELING RESULTS

Pollutant	Averaging Period	PSD Increment (μg/m³)	Model-Predicted Peak Conc. (μg/m³)	% Of the Increment	Location of Peak Conc.
NO_2	Annual	25	18.47	74%	Outokumpu facility, 100m spacing
PM_{10}	Annual	17	2.94	17%	AM/NS Property boundary, 100m spacing
$PM_{2.5}$ (with secondary)	24-hour	9	7.26(1)	81%	AM/NS Property boundary, 100m spacing
	Annual	4	1.56(1)	39%	AM/NS Property boundary, 100m spacing

(1) $PM_{2.5}$ 24-hour secondary: 0.025 (μg/m³), $PM_{2.5}$ Annual secondary: 0.001 (μg/m³). $PM_{2.5}$ 24-hour offsite increment secondary: 3.22 (μg/m³). $PM_{2.5}$ Annual increment offsite secondary: 0.43 (μg/m³). These values were added to the primary 24-hour and annual $PM_{2.5}$ modeling results, respectively. The calculations for the project secondary values are shown in Section 10.5.

10.5 SECONDARY FORMATION OF $PM_{2.5}$

For estimating the Project impacts on secondary $PM_{2.5}$, AMC completed a Modeled Emission Rates for Precursors (MERPs) analysis. Secondary $PM_{2.5}$ precursors are from emissions of NO_X and SO_2.

AMC utilized the U.S. EPA's MERPs as a first-tier assessment of impacts on secondary $PM_{2.5}$ formation and following the latest guidance from April 30, 2024[6]. EPA provides a MERPs View Qlik Tool[7] for identifying a representative hypothetical source and using the hypothetical source modeled impacts on $PM_{2.5}$ to estimate Project secondary $PM_{2.5}$ impacts. Table 10-4 shows the MERPs for the most representative hypothetical source (e.g., 500 tpy and 10 meters stack) located nearest to the AMC facility. The Autauga, Alabama hypothetical source is approximately 200 km north of the AMC facility, both sites are in a relatively flat terrain. The Project elevation is about 14 meters in comparison to the Autauga site at 96 meters. Appendix C provides additional justification for the hypothetical source selection. The results of the MERPs View Qlik Tool are summarized in Table 10-4.

6 U.S. EPA. Supplement to the Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program. April 30, 2024. Available at: https://www.epa.gov/system/files/documents/2024-04/supplement-to-the-guidance-on-significant-impact-levels-for-ozone-and-fine-particles-in-the-psd-permitting-program-4-30-2024.pdf

7 United States Environmental Protection Agency. 2024. MERPs View Qlik Tool. Available at: https://www.epa.gov/scram/merps-view-qlik

TABLE 10-4 EPA MERPS VIEW QLIK OUTPUT

State	County	Metric	Precursor	Emissions (TPY)	Stack (m)	EPA Max Conc
Alabama	Autauga	8-hr Ozone	NOx	500	10	2.012 ppb
Alabama	Autauga	8-hr Ozone	VOC	500	10	0.064 ppb
Alabama	Autauga	Annual PM2.5	NOx	500	10	0.010 µg/m^3
Alabama	Autauga	Annual PM2.5	SO2	500	10	0.029 µg/m^3
Alabama	Autauga	Daily PM2.5	NOx	500	10	0.178 µg/m^3
Alabama	Autauga	Daily PM2.5	SO2	500	10	1.231 µg/m^3

The secondary formation of $PM_{2.5}$ as a result of pre-cursor emissions of NOx (64.82 tpy) and SO_2 (0.58 tpy). Project emissions[8] was computed using Equation 1 from the 2024 guidance[6] and hypothetical source data from Table 10-4.

Equation 1:

Project Air Quality Impact = Project emissions * (modeled air quality impact from hypothetical source / modeled emissions rate from hypothetical source)

24-hour $PM_{2.5}$ Secondary Project Air Quality Impact

NO_x Project Air Quality Impact = 64.82 tpy * (0.178 µg/m^3 / 500 tpy) = 0.0231 µg/m^3

SO_2 Project Air Quality Impact = 0.58 tpy * (1.231 µg/m^3 / 500 tpy) = 0.0014 µg/m^3

Total Secondary (NO_X & SO_2) 24-hour Project Air Quality Impact =

0.0231 µg/m^3 + 0.0014 µg/m^3 = 0.025 µg/m^3

The calculated amount of **0.025 µg/m^3** will be then added to the primary $PM_{2.5}$ modeled concentration at the SIL, NAAQS, and PSD level before comparing to applicable thresholds to account for the contribution of 24-hour secondary $PM_{2.5}$.

Annual $PM_{2.5}$ Secondary Project Air Quality Impact

NO_x Project Air Quality Impact = 64.82 tpy * (0.010 µg/m^3 / 500 tpy) = 0.001 µg/m^3

SO_2 Project Air Quality Impact = 0.58 tpy * (0.029 µg/m^3 / 500 tpy) = 0.00003 µg/m^3

[8] Based on 100 hours of non-emergency use for engines

Total Secondary (NO_X & SO_2) Annual Project Air Quality Impact =

0.001 µg/m^3 + 0.00003 µg/m^3 = 0.001 µg/m^3

The calculated amount of **0.001 µg/m^3** was added to the primary annual $PM_{2.5}$ modeled concentration at the SIL, NAAQS, and PSD level before comparing to applicable thresholds to account for the contribution of annual secondary $PM_{2.5}$.

For the secondary offsite contribution as well as the existing AMNS sources, ADEM provided a 24-hour increment concentration (3.2165 µg/m^3), a 24-hour NAAQS concentration (7.786 µg/m^3), and an annual concentration for use in both increment and NAAQS modeling (0.425 µg/m^3). These values were added to their respective averaging periods/standards in the cumulative modeling, as shown in Tables 10-2 and 10-3.

10.6 OZONE AMBIENT IMPACT ANALYSIS

For estimating the Project impacts on ozone formation, AMC completed a Modeled Emission Rates for Precursors (MERPs) analysis. Ozone precursors are emissions of VOC and NO_X.

AMC utilized the U.S. EPA's MERPs as a first-tier assessment of impacts on ozone formation. EPA provides a MERPs tool[9] for identifying a representative hypothetical source and using the hypothetical source modeled impacts on ozone and $PM_{2.5}$ to estimate Project impacts on ozone and $PM_{2.5}$. Table 10-4 shows the MERPs for the most representative hypothetical source located nearest to the AMC facility. The Autauga, Alabama hypothetical source (e.g., 500 tpy and 10 meters stack) is approximately 200 km north of the AMC facility, both in a flat terrain. Appendix C provides additional justification for the hypothetical source selection.

Ozone concentration as a result of pre-cursor emissions of NOx (64.82 tpy) and VOC (45.86 tpy) Project emissions was computed using Equation 1 from the 2024 guidance[6] and hypothetical source data from Table 10-5.

8-hour Ozone Secondary Project Air Quality Impact

NO_x Project Air Quality Impact = 64.82 tpy * (2.01 ppb / 500 tpy) = 0.261 ppb

VOC Project Air Quality Impact = 45.86 tpy * (0.064 ppb / 500 tpy) = 0.006 ppb

Total Secondary (NO_X & VOC) Project Air Quality Impact =

0.261 ppb + 0.006 ppb = 0.27 ppb

The Project's preliminary ozone impacts are estimated to be **0.27 ppb**, which is less than the ozone SIL of 1 ppb. Table 10-6 shows the Project's ozone impacts added to a background monitor ozone value. The nearest active monitor with three recent years of complete data is the Chickasaw monitor (ID: 01-097-0003). Because of its proximity to the plant site, this monitor provides the best representative ozone data for the area of the AMC facility, as documented in Appendix C.

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9 United States Environmental Protection Agency. 2024. MERPs View Qlik Tool. Available at: https://www.epa.gov/scram/merps-view-qlik

TABLE 10-5 OZONE MERPs ANALYSIS RESULTS

Ozone Averaging Period	Ozone Class II SIL (ppb)	Precursor	Project Emissions (TPY)	Ozone MERP (TPY)	Ozone Secondary Concentration (ppb)
8-hour	1.0	NO_x	64.82	249	0.27
		VOC	45.86	7796	

TABLE 10-6 PROJECT OZONE IMPACTS AND BACKGROUND OZONE VALUE NAAQS COMPARISON

Chickasaw Background Ozone Value (2021-2023) (ppb)	Project Ozone Impact (ppb)	Total Ozone Impact (ppb)	8-hour Ozone NAAQS (ppb)	Exceeds NAAQS?
60.00	0.27	60.27	70	No

As shown in the table, the total ozone impact including the background ozone value is less than the NAAQS; therefore, this preliminary analysis shows that the Project demonstrates compliance with the ozone NAAQS in all areas.

11. ADDITIONAL AIR QUALITY IMPACT ANALYSES

A qualitative assessment of the impacts on general growth, soil, and vegetation associated with the proposed modification was performed. The additional impact analysis has been conducted to evaluate the following:

- Analysis of additional growth associated with the proposed modification,
- Analysis of potential detrimental effects to soils, and
- Analysis of potential detrimental effects to vegetation with economic or recreational value.

11.1 ADDITIONAL GROWTH ANALYSIS

The growth impacts analysis focuses qualitatively on the Project's potential impact on industrial, commercial, and residential growth in the surrounding area. Any potential significant emissions due to growth are required to be incorporated into the PSD NAAQS analysis.

The operation of the proposed facility will result in minimal growth in the area surrounding the proposed facility. With respect to industrial growth, AMC does not anticipate suppliers to locate within the surrounding area. With respect to residential growth, AMC anticipates that employment at the facility will increase by approximately 260 full time personnel due to the proposed Project.

AMC plans to follow their normal practice of hiring from the existing workforce in the local area. As a result, there will not be a large, immediate increase in the development of housing in the area. Therefore, the increase in growth will not be large enough to result in a quantifiable increase in emissions and conducting additional modeling was not required to assess impacts due to growth.

11.2 SOIL AND VEGETATION ANALYSIS

PSD regulations require an analysis to assess the potential impacts to soils and vegetation. The analysis evaluates the maximum predicted short-term concentrations for the proposed Project relative to the USEPA-recommended screening concentrations[10].

The screening levels represent the minimum concentrations in either plant tissue or soils at which adverse growth effects or tissue injury was reported in the literature. The NAAQS secondary standards were set to protect public welfare, including protection against damage to crops and vegetation. Comparing the modeled emissions to the air quality related values (AQRV) screening concentrations and the NAAQS secondary standards provides one indication as to whether potential impacts are likely to be significant for vegetation and soils. Table 11-1 summarizes cumulative concentrations for the pollutants and averaging periods for which the Project was significant.

As shown in Table 11-1, the cumulative impacts will not exceed any of the applicable AQRV screening concentrations or NAAQS secondary standards. Therefore, the Project will not have a significant impact on soils and vegetation.

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[10] A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals" (USEPA, 1980)

TABLE 11-1 SOILS AND VEGETATION IMPACT ANALYSIS

Pollutant	Averaging Period	Cumulative Concentration (µg/m^3)	AQRV Screening Levels (µg/m^3)	Secondary NAAQS (µg/m^3)
NO_2	4-hour	1,569.74 (1)	3,760	--
	8-hour	1,569.74 (1)	3,760	--
	Monthly	416.40	564	--
$PM_{2.5}$ (with secondary)	24-hour	31.94(2)	--	35
	Annual	8.69(2)	--	15

(1) For 4-hour and 8-hour NO_2, the model-predicted 1-hour NO_2 NAAQS was conservatively used.
(2) $PM_{2.5}$ 24-hour project secondary: 0.025 (µg/m^3), $PM_{2.5}$ Annual project secondary: 0.001 (µg/m^3). $PM_{2.5}$ 24-hour offsite secondary: 7.79 (µg/m^3). $PM_{2.5}$ Annual offsite secondary: 0.43 (µg/m^3). These values were added to the primary 24-hour and annual $PM_{2.5}$ modeling results, respectively. The calculations for the project secondary values are shown in Section 10.5.

11.3 CUMULATIVE MODELING CONCLUSIONS

The refined modeling concluded that the air quality as a results of the Project emissions will be in compliance with the all applicable NAAQS and PSD increment.

11.4 IMPACT ON VISIBILITY

Any facility emitting significant amounts of TSP/PM_{10} and/or NO_X has a potential adverse impact on visibility through atmospheric discoloration or reduction of visual range due to increased haze.

A visibility analysis was not required using the VISCREEN model as there are no regional airports or scenic vistas located within the significant impact area of the proposed modification. The closest identified Class II area is Meaher State Park, which is greater than 40 km away and well outside the largest project SIA (1-hour NO_2 SIA is 10.63 km) .

As the increase in emissions associated with the operation of the facility will result in only a very small increase in air quality impacts in a small area surrounding the facility, it is unlikely that the operation of the facility will cause any impairment to visibility at any location.

12. IMPACT ON PSD CLASS I AREAS

The nearest PSD Class I area is the Breton Wildlife Refuge, located approximately 130 km south-southwest of the mill, as shown in Figure 12-1. Because the Class I area is greater than 100 km from AMC, ADEM does not require AMC to address the modification's impact on PSD Increment at the Class I Area. The Federal Land Managers (FLM) use the following approach to determine whether a PSD Project should provide detailed dispersion modeling impact analyses for air quality related values (AQRVs):

$$[SO_2 + NO_x + PM_{10} \text{ emissions (tpy)}]/ \text{distance (km)} > 10$$

Using the maximum 24-hour emissions increases associated with the modification, we evaluated the above equation and the corresponding results are (0.59 tpy of SO_2 + 72.93 tpy of NO_x + 41.63 tpy of PM_{10})/130 km = 0.89. Because this factor is well below the screening level of 10, AQRV analyses for the Class will not be required. The Federal Land Manager of the Class I area have been notified with the "Request for Applicability of Class I Area Modeling Analysis, Southern Region, U.S. Forest Service" form, as shown in Figure 12-2. Note that the NOx emissions and PM_{10} emissions have been increased since the form was submitted in September, which increased the factor from 0.6 to 0.89. Jaron Ming of FWS has confirmed on September, 19, 2024 that based on the provided information in the form, Class I modeling will not be required.

Both FLM and ADEM will be provided with any details relevant to Class I impacts from the proposed modification.

FIGURE 12-1 CLASS I AREA LOCATION RELATIVE TO THE PROJECT

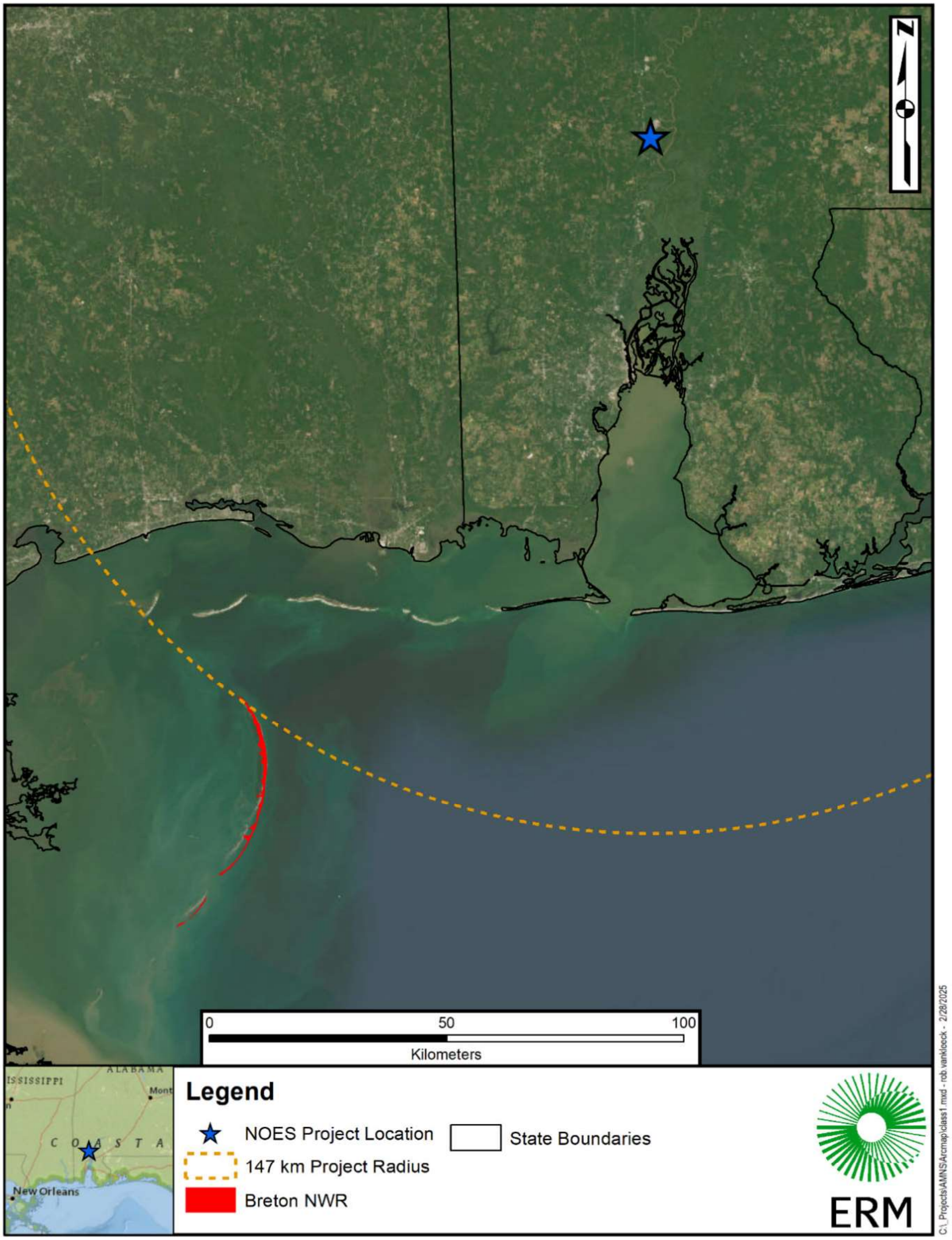


FIGURE 12-2 CLASS I AREA FORM TO US FOREST SERVICE

Request for Applicability of Class I Area Modeling Analysis
Southern Region, U.S. Forest Service

Facility Name (Company Name)	ArcelorMittal Calvert
New Facility or Modification?	Modification
Source Type	Carbon Steel Mill
Project Location (County/State/ Lat. & Long. in decimal degrees)	Calvert, Alabama lat=31.145279°, long= -87.991202°

Application Contacts

Applicant		*Consultant*		*Air Agency Permit Engineer*	
Company	ArcelorMittal Calvert	**Company**	ERM	**Agency**	ADEM
Contact	Jacqueline Gorski	**Contact**	Joe Gross	**Contact**	Jackson Rogers P.E.
Address	AM/NS Calvert, LLC P.O. Box 456 Calvert, AL 36513	**Address**	3838 N. Causeway Blvd. Suite 3000 Metairie, LA 70002	**Address**	1400 Coliseum Blvd. Montgomery, AL 36110-2400
Phone #	251-289-3395	**Phone #**	504-617-0184	**Phone #**	334-271-7784
Email	jacqueline.gorski@arcelormittal.com	**Email**	joe.gross@erm.com	**Email**	jackson.rogers@adem.alabama.gov

Briefly Describe the Proposed Project

Construction of annealing, pickling and coating operations to support the development of electrical steel.

Proposed Emissions and BACT

Criteria Pollutant	*Proposed Emissions (tons/year)*	*Emission Factor (AP-42, Stack Test, etc?)*	*Proposed BACT*
Nitrogen Oxides	49.59	AP-42, Vendor Data	SCR, Low NOx Burners, Good Combustion Practices
Sulfur Dioxide	0.58	AP-42	N/A, Project is not triggering PSD for SO2. Good Combustion Practices, and the use of low sulfur fuels (i.e. natural gas) will be used.
Particulate Matter (filterable+condensable)	25.75	AP-42, Vendor Data	Baghouse, Wet Scrubber, Mist Eliminator, Good Combustion Practices, Drift Eliminators
Volatile Organic Compounds	42.21	AP-42, Vendor Data	Regenerative Thermal Oxidizer, Good Combustion Practices

Proximity to U.S. Forest Service Class I Areas

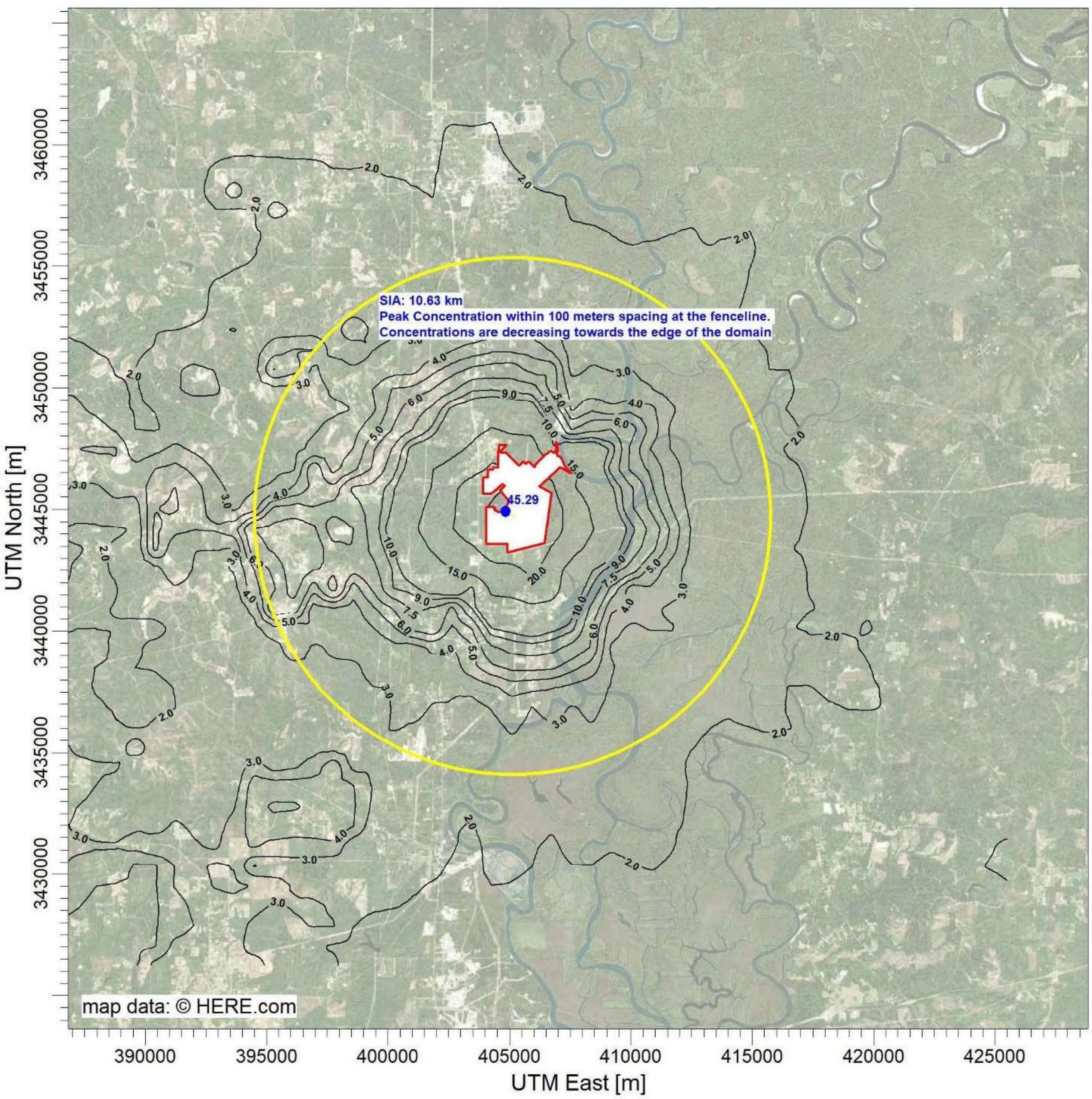
Class I Area	Breton		
Distance from Facility (km)	130		
Calculated Q/d (from above)	0.6		

For Additional Information or Questions, Contact Melanie Pitrolo
(828) 257-4213 or mpitrolo@fs.fed.us

APPENDICES

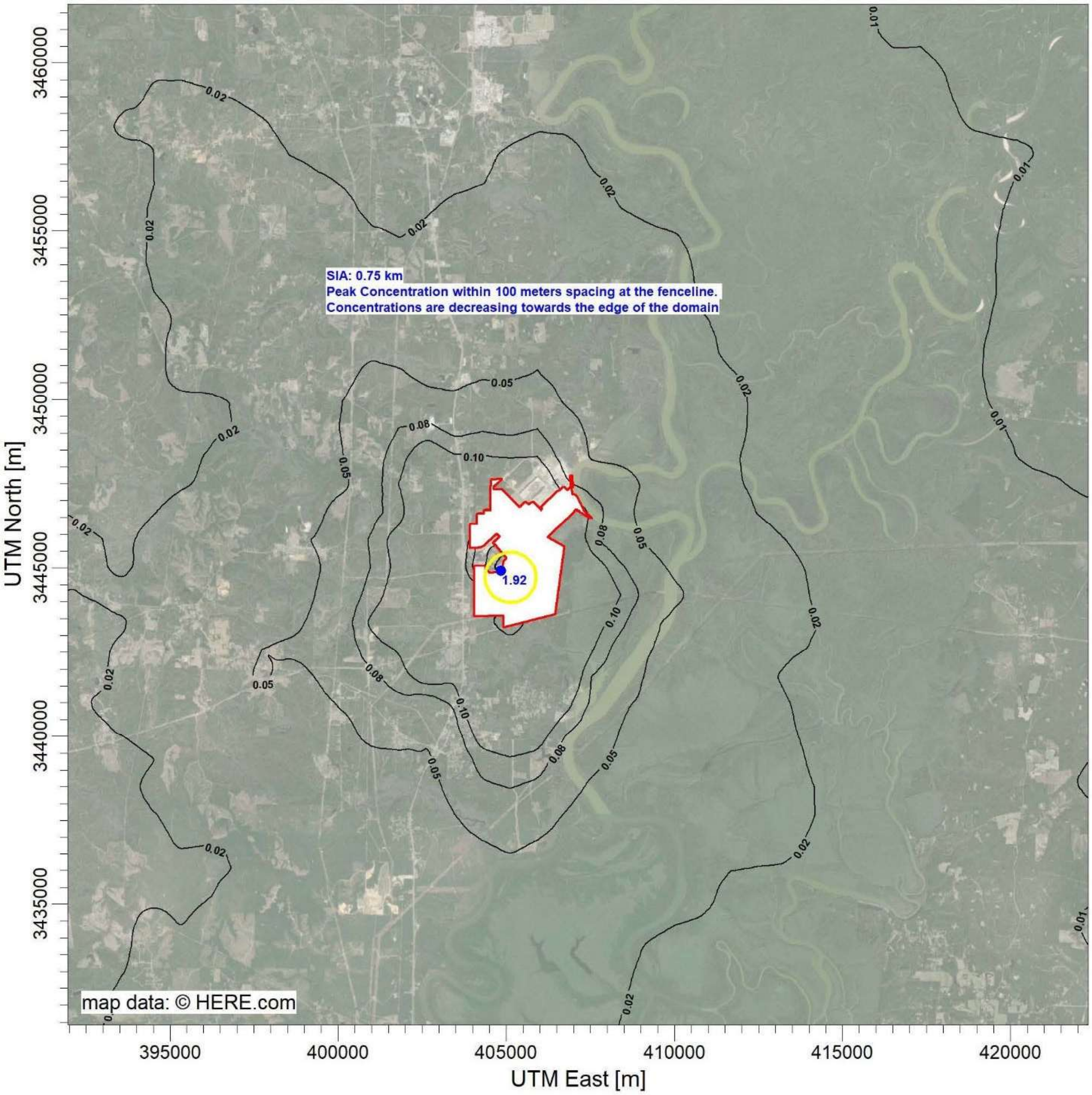
APPENDIX A SIL MODELING RESULTS FIGURES

FIGURE A-1 NO_2 1-HOUR SIL MODELING RESULTS CONTOUR PLOT AND SIA



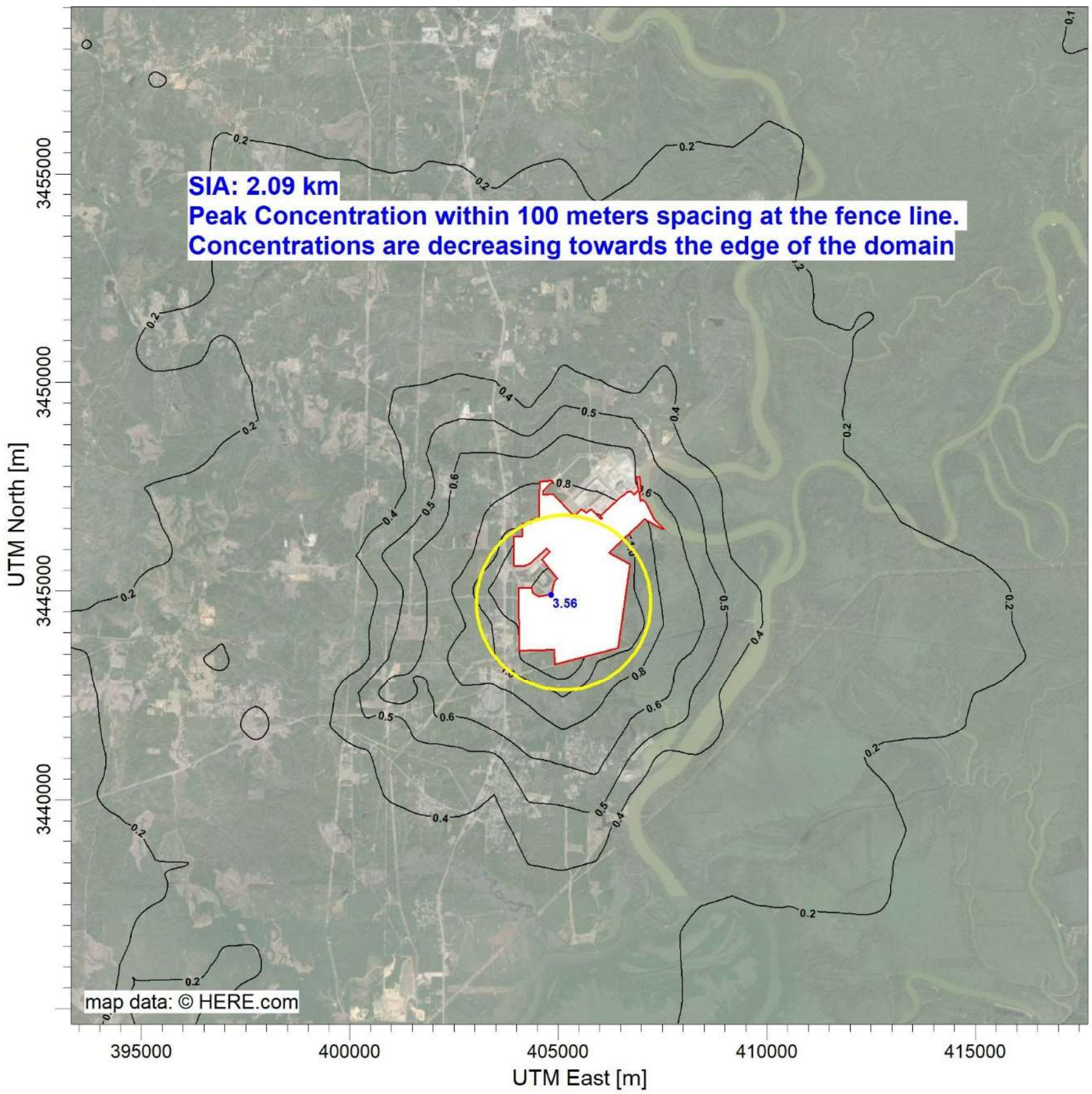
COMMENTS:	SOURCES:	COMPANY NAME:	
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	**32**		
	RECEPTORS: **13433**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:264,104 0 — 10 km	
	MAX: **45.3 ug/m^3**	DATE: **2/6/2025**	PROJECT NO.:

FIGURE A-2 NO_2 ANNUAL SIL MODELING RESULTS CONTOUR PLOT AND SIA



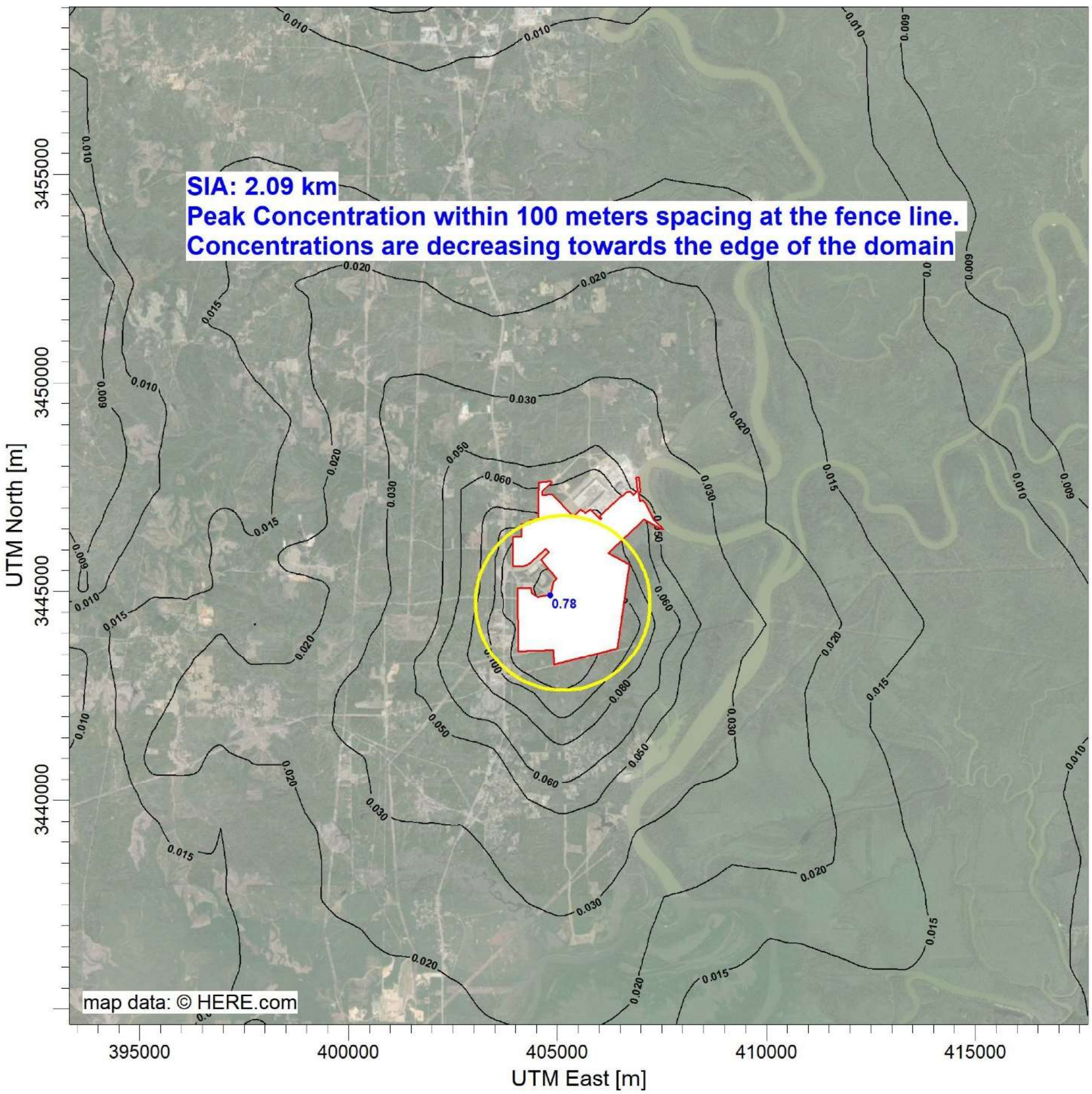
COMMENTS:	SOURCES:	COMPANY NAME:	
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	**32**		
	RECEPTORS: **13433**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:190,813 0 — 5 km	
	MAX: **1.92 ug/m^3**	DATE: **2/6/2025**	PROJECT NO.:

FIGURE A-3 $PM_{2.5}$ 24-HOUR SIL MODELING RESULTS CONTOUR PLOT AND SIA



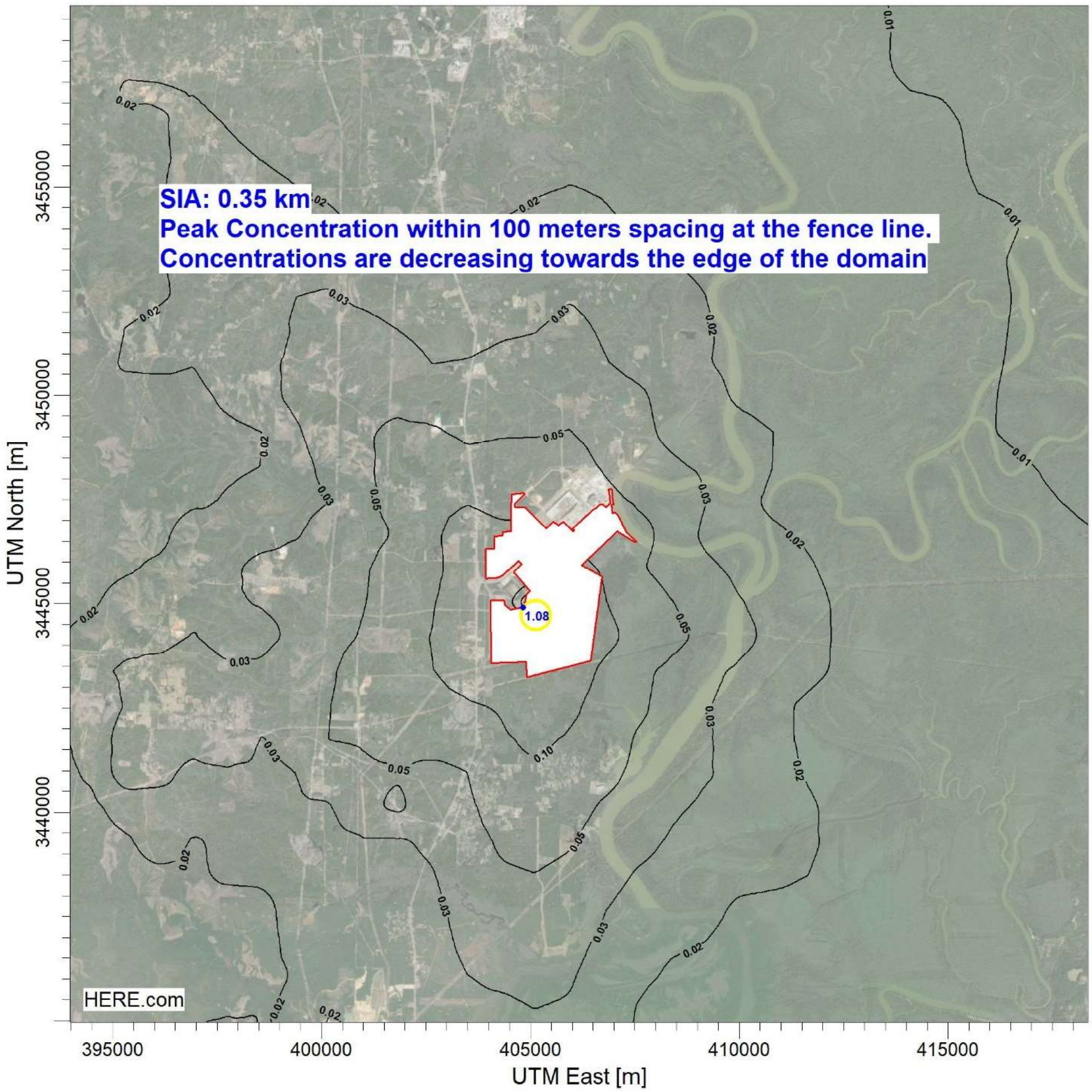
COMMENTS:	SOURCES:	COMPANY NAME:	
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	32		
	RECEPTORS: 13433	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:153,332 0 5 km	
	MAX: 3.6 ug/m^3	DATE: 3/24/2025	PROJECT NO.:

FIGURE A-4 $PM_{2.5}$ ANNUAL SIL MODELING RESULTS CONTOUR PLOT AND SIA



COMMENTS:	SOURCES:	COMPANY NAME:	
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	**32**		
	RECEPTORS: **13433**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:153,332 0 — 5 km	
	MAX: **7.8E-01 ug/m^3**	DATE: **3/24/2025**	PROJECT NO.:

FIGURE A-5 PM_{10} ANNUAL SIL MODELING RESULTS CONTOUR PLOT AND SIA



COMMENTS:	SOURCES:	COMPANY NAME:	
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	32		
	RECEPTORS: 13433	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:153,252 (0 – 5 km)	
	MAX: 1.08 ug/m^3	DATE: 3/24/2025	PROJECT NO.:

APPENDIX B EMISSIONS AND EXHAUST PARAMETERS OF THE EXISTING AM/NS SOURCES

Table B-1 Existing AM/NS Sources		Location and Stack Parameters								Potential to Emit			Date Operation Began
Source ID	**Description**	**Type**	**UTMx**	**UTMy**	**Base Elevation**	**Height (m)**	**Temp (K)**	**Velocity (m/s)**	**Diameter (m)**	**PM25 ST (g/s)**	**PM25 LT (g/s)**	**NO2 (g/s)**	
EAF1	Electric Arc Furnance No. 1	POINT	406745.97	3446703.8	14.9	61.00	391.48	23.03	6.50	7.82E+00	5.21E+00	1.46E+01	After October 2010
EAF2	Electric Arc Furnace No. 2	POINT	406755.44	3446673.6	14.9	61.00	391.48	23.03	6.50	7.82E+00	5.21E+00	1.46E+01	After October 2010
DEGAS_1	Degasser Flare No. 1	POINT	406912.66	3446932	14.9	50.37	1273.00	20.00	0.40	4.17E-02	4.79E-02	1.92E-01	After October 2010
Alloy01	Alloys Silo 1	POINTHOR	407021.72	3446747	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy02	Alloys Silo 2	POINTHOR	407019.75	3446745	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy03	Alloys Silo 3	POINTHOR	407017.67	3446743	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy04	Alloys Silo 4	POINTHOR	407015.7	3446741.1	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy05	Alloys Silo 5	POINTHOR	407013.63	3446739.1	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy06	Alloys Silo 6	POINTHOR	407011.66	3446737.2	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy07	Alloys Silo 7	POINTHOR	407019.63	3446749.1	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy08	Alloys Silo 8	POINTHOR	407017.63	3446747.2	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy09	Alloys Silo 9	POINTHOR	407015.55	3446745.2	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy10	Alloys Silo 10	POINTHOR	407013.58	3446743.3	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy11	Alloys Silo 11	POINTHOR	407011.5	3446741.3	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy12	Alloys Silo 12	POINTHOR	407009.54	3446739.4	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy13	Alloys Silo 13	POINTHOR	407015.35	3446753.5	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy14	Alloys Silo 14	POINTHOR	407013.38	3446751.6	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy15	Alloys Silo 15	POINTHOR	407011.3	3446749.6	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy16	Alloys Silo 16	POINTHOR	407009.34	3446747.7	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy17	Alloys Silo 17	POINTHOR	407007.26	3446745.7	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy18	Alloys Silo 18	POINTHOR	407005.29	3446743.8	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy19	Alloys Silo 19	POINTHOR	407013.23	3446755.7	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy20	Alloys Silo 20	POINTHOR	407011.26	3446753.8	14.9	18.14	Ambient	0.11	1.03	1.08E 03	1.08E 03	0.00E+00	After October 2010

Table B-1 Existing AM/NS Sources		Location and Stack Parameters								Potential to Emit			Date Operation Began
Source ID	Description	Type	UTMx	UTMy	Base Elevation	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)	PM25 ST (g/s)	PM25 LT (g/s)	NO2 (g/s)	
Alloy21	Alloys Silo 21	POINTHOR	407009.18	3446751.8	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy22	Alloys Silo 22	POINTHOR	407007.21	3446749.9	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy23	Alloys Silo 23	POINTHOR	407005.14	3446747.9	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Alloy24	Alloys Silo 24	POINTHOR	407003.17	3446745.9	14.9	18.14	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
DRI01	DRI Silo 1	POINTHOR	407087.43	3446800.7	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
DRI02	DRI Silo 2	POINTHOR	407072.13	3446785.8	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
DRI03	DRI Silo 3	POINTHOR	407056.82	3446771	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
DRI04	DRI Silo 4	POINTHOR	407041.52	3446756.1	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
DRI05	DRI Silo 5	POINTHOR	407072.58	3446816	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
DRI06	DRI Silo 6	POINTHOR	407057.27	3446801.1	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
DRI07	DRI Silo 7	POINTHOR	407041.97	3446786.3	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
DRI08	DRI Silo 8	POINTHOR	407026.66	3446771.4	14.9	27.43	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
Lime01	LDB Silo 1	POINTHOR	407032.61	3446738.4	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime02	LDB Silo 2	POINTHOR	407029.77	3446735.7	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime03	LDB Silo 3	POINTHOR	407026.92	3446732.9	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime04	LDB Silo 4	POINTHOR	407024.08	3446730.1	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime05	LDB Silo 5	POINTHOR	407021.24	3446727.4	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime06	LDB Silo 6	POINTHOR	407029.85	3446741.3	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime07	LDB Silo 7	POINTHOR	407027.01	3446738.5	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime08	LDB Silo 8	POINTHOR	407024.17	3446735.7	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime09	LDB Silo 9	POINTHOR	407021.32	3446733	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Lime10	LDB Silo 10	POINTHOR	407018.48	3446730.2	14.9	32.80	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Inject01	Flux Silo 1	POINTHOR	406986.71	3446739.7	14.9	17.25	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010

Table B-1 Existing AM/NS Sources		Location and Stack Parameters								Potential to Emit			Date Operation Began
Source ID	Description	Type	UTMx	UTMy	Base Elevation	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)	PM25 ST (g/s)	PM25 LT (g/s)	NO2 (g/s)	
Inject02	Flux Silo 2	POINTHOR	406981.68	3446744.9	14.9	17.25	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Inject03	Flux Silo 3	POINTHOR	406976.75	3446750	14.9	17.25	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Inject04	Flux Silo 4	POINTHOR	406972.16	3446754.7	14.9	17.25	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
Inject05	Flux Silo 5	POINTHOR	406966.91	3446760.1	14.9	17.25	Ambient	0.11	1.03	1.08E-03	1.08E-03	0.00E+00	After October 2010
HBI01	HBI Silo 1	POINTHOR	407039.55	3446733	14.9	15.54	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
HBI02	HBI Silo 2	POINTHOR	407037.8	3446731.3	14.9	15.54	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
HBI03	HBI Silo 3	POINTHOR	407033.87	3446727.5	14.9	15.54	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
HBI04	HBI Silo 4	POINTHOR	407032.12	3446725.8	14.9	15.54	Ambient	0.45	1.03	4.32E-03	4.32E-03	0.00E+00	After October 2010
BH_SILO1	BH Silo 1	POINTHOR	406776.09	3446711.2	14.9	18.29	Ambient	0.51	1.03	4.83E-03	4.83E-03	0.00E+00	After October 2010
BH_SILO2	BH Silo 2	POINTHOR	406783.12	3446717.9	14.9	18.29	Ambient	0.51	1.03	4.83E-03	4.83E-03	0.00E+00	After October 2010
CAST_1	Contact Water Stack 1	POINTCAP	406863.09	3446968.8	14.9	51.37	333.15	42.28	1.42	4.33E-01	4.33E-01	0.00E+00	After October 2010
CAST_2	Contact Water Stack 2	POINTCAP	406830.96	3447008.9	14.9	51.37	333.15	42.28	1.42	4.33E-01	4.33E-01	0.00E+00	After October 2010
ESP	Scarfing Electrostatic Precipitator	POINT	406920.41	3447158.3	14.9	65.00	333.15	20.00	2.20	0.00E+00	0.00E+00	0.00E+00	After October 2010
GRBH	New Grinder Baghouse Stack (as of N	POINT	406815	3447246	14.9	20.00	Ambient	14.61	1.10	1.17E-02	1.17E-02	0.00E+00	After October 2010
S1	Walking Beam Furnance #1	POINT	406550.21	3447068.5	14.9	66.18	623.15	5.15	5.08	7.93E-01	7.93E-01	9.05E+00	(on or before) June 2010
S2	Walking Beam Furnance #2	POINT	406567.64	3447086	14.9	66.18	623.15	5.15	5.08	7.93E-01	7.93E-01	9.05E+00	(on or before) June 2010
S3	Walking Beam Furnance #3	POINT	406585.18	3447103.2	14.9	66.18	623.15	5.15	5.08	7.93E-01	7.93E-01	9.05E+00	(on or before) June 2010
S5	S5 Finishing Mill (No Horizontal Shift) (1)	POINT	406260.75	3446870.3	14.9	65.00	313.15	56.51	1.12	4.96E-01	4.18E-01	0.00E+00	(on or before) June 2010
S5A	S5a Roughing Mill (No Horizontal Shift) (1)	POINT	406362.63	3446981.4	14.9	65.00	313.15	16.95	1.12	1.49E-01	1.25E-01	0.00E+00	(on or before) June 2010
S6	Continuous Pickling Line #1 - Processor/Stretcher/Leveler with Bagho (1)	POINT	405916.32	3446524.5	14.9	32.00	303.15	18.25	1.32	2.59E-01	2.16E-01	0.00E+00	(on or before) June 2010
S7	Continuous Pickling Line #2 - Processor/Stretcher/Leveler with Bagho (1)	POINT	405851.91	3446564.5	14.9	32.00	303.15	18.25	1.32	2.59E-01	1.86E-01	0.00E+00	(on or before) June 2010
S8	Continuous Pickling Line #1 Pickling Tank with Scrubber	POINT	405782.25	3446398	14.9	33.55	313.15	8.76	0.90	9.90E-02	9.90E-02	0.00E+00	(on or before) June 2010
S9	Continuous Pickling Line #2 Pickling Tank with Scrubber	POINT	405772.03	3446490.9	14.9	33.55	313.15	8.76	0.90	9.90E-02	9.90E-02	0.00E+00	(on or before) June 2010

Table B-1 Existing AM/NS Sources		Location and Stack Parameters								Potential to Emit			Date Operation Began
Source ID	Description	Type	UTMx	UTMy	Base Elevation	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)	PM25 ST (g/s)	PM25 LT (g/s)	NO2 (g/s)	
S10	Tank Farm Scrubber	POINT	405810.77	3446652.8	14.9	24.99	353.15	25.69	0.56	9.62E-02	9.62E-02	0.00E+00	(on or before) June 2010
S12	Continuous Pickling Line #1 - Tandem Mill with Mist Eliminator (1)	POINT	405653.42	3446264.9	14.9	33.50	303.15	14.54	3.00	1.37E-01	1.14E-01	0.00E+00	(on or before) June 2010
S14	Roll Shop - Chrome Plating with Mist Eliminator	POINT	405797.79	3446464.5	14.9	33.49	293.15	19.38	0.97	3.89E-04	3.89E-04	0.00E+00	(on or before) June 2010
S15	CHDGL-1 Cleaning Section and Dryer with Mist Eliminator	POINT	405533.13	3446182.5	14.9	44.00	343.00	11.93	0.80	7.07E-02	7.07E-02	1.42E-02	(on or before) June 2010
S16	CHDGL-2 Cleaning Section and Dryer with Mist Eliminator	POINT	405435.42	3446283.2	14.9	44.00	343.00	11.93	0.80	7.07E-02	7.07E-02	1.42E-02	(on or before) June 2010
S17	CHDGL-3 Cleaning Section and Dryer with Mist Eliminator	POINT	405571.4	3446143	14.9	44.00	343.00	11.93	0.80	7.07E-02	7.07E-02	1.42E-02	(on or before) June 2010
S19	Continuous Hot Dip Galvanizing Line #1 - Annealing Furnace	POINT	405513.02	3446163.9	14.9	44.99	573.00	17.45	1.45	1.03E-01	1.03E-01	8.32E-01	(on or before) June 2010
S20	Continuous Hot Dip Galvanizing Line #2 - Annealing Furnace and Water	POINT	405415.29	3446264.5	14.9	44.81	500.22	16.34	1.25	1.37E-01	1.37E-01	1.00E+00	(on or before) June 2010
S21	Continuous Hot Dip Galvanizing Line #3 - Annealing Furnace	POINT	405552.25	3446123.3	14.9	44.99	573.00	17.45	1.45	1.03E-01	1.03E-01	8.32E-01	(on or before) June 2010
S22	Continuous Hot Dip Galvanizing Line #4 - Annealing Furnace with SCR	POINT	405428.25	3446198.6	14.9	45.70	565.93	29.20	1.25	1.18E-01	1.18E-01	9.07E-01	(on or before) June 2010
S27	Continuous Hot Dip Galvanizing Line #1 - Skin Pass Mill + Dryer with	POINT	405416.11	3446068.9	14.9	44.00	323.00	11.67	1.01	7.56E-02	7.56E-02	1.42E-02	(on or before) June 2010
S28	Continuous Hot Dip Galvanizing Line #2 - Skin Pass Mill + Dryer with	POINT	405318.37	3446169.5	14.9	43.99	323.00	11.67	1.01	7.51E-02	7.51E-02	1.42E-02	(on or before) June 2010
S29	Continuous Hot Dip Galvanizing Line #3 - Skin Pass Mill + Dryer with	POINT	405454.39	3446029.4	14.9	44.00	323.00	11.67	1.01	7.56E-02	7.56E-02	1.42E-02	(on or before) June 2010
S30	Continuous Hot Dip Galvanizing Line #4 - Skin Pass Mill with Mist El	POINT	405356.78	3446130	14.9	43.99	303.15	10.29	1.01	7.95E-02	7.95E-02	0.00E+00	(on or before) June 2010
S31	Continuous Hot Dip Galvanizing Line #1 - Post Treatment Dryer	POINT	405388.66	3446042.5	14.9	44.00	343.00	14.84	0.50	8.66E-03	8.66E-03	5.80E-02	(on or before) June 2010
S33	Continuous Hot Dip Galvanizing Line #3 - Post Treatment Dryer	POINT	405427.09	3446003	14.9	44.00	343.00	14.84	0.50	8.66E-03	8.66E-03	5.80E-02	(on or before) June 2010
S34	Continuous Hot Dip Galvanizing Line #4 - Line 4 Dryer and Post-Treat	POINT	405329.44	3446103.5	14.9	44.00	343.15	20.54	0.50	1.04E-02	1.04E-02	8.19E-02	(on or before) June 2010
S36	Skin Pass Mill with Mist Eliminator (1)	POINT	405283.37	3445982.4	14.9	26.50	303.15	20.11	1.00	8.30E-02	6.30E-02	0.00E+00	(on or before) June 2010
S37	Boiler #1	POINT	405757.14	3446607.5	14.9	15.26	420.93	16.91	0.91	6.57E-02	6.57E-02	3.09E-01	(on or before) June 2010
S38	Boiler #2	POINT	405750.67	3446614.2	14.9	15.26	420.93	16.91	0.91	6.57E-02	6.57E-02	3.09E-01	(on or before) June 2010
S39	Boiler #3	POINT	405744.12	3446621	14.9	15.26	420.93	16.91	0.91	6.57E-02	6.57E-02	3.09E-01	(on or before) June 2010
S59	Spray Roaster Baghouse	POINT	405680.17	3446611.2	14.9	30.48	358.15	19.69	0.36	5.01E-02	5.01E-02	0.00E+00	After October 2010
S60	Spray Roaster Scrubber	POINT	405675.69	3446628.3	14.9	45.72	358.15	21.43	1.01	2.31E-01	2.31E-01	5.77E-01	After October 2010

Table B-1 Existing AM/NS Sources		Location and Stack Parameters								Potential to Emit			Date Operation Began
Source ID	Description	Type	UTMx	UTMy	Base Elevation	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)	PM25 ST (g/s)	PM25 LT (g/s)	NO2 (g/s)	
BV1	Batch Annealing Furnace (Building Vent 1)	POINT	405696.97	3446438.9	14.9	25.15	309.82	35.09	5.08	3.30E-02	1.09E-02	4.32E-01	After October 2010
BV2	Batch Annealing Furnace (Building Vent 2)	POINT	405675.33	3446416.9	14.9	25.15	309.82	35.09	5.08	3.30E-02	1.09E-02	4.32E-01	After October 2010
S42	CWC - Generator	POINT	406453.03	3446888.2	14.9	2.41	772.65	112.54	0.10	1.69E-02	1.93E-04	0.00E+00	(on or before) June 2010
S43	Generator Electrical Room 2-1	POINT	406415.71	3447042.5	14.9	11.28	774.25	44.24	0.30	6.37E-02	7.27E-04	0.00E+00	(on or before) June 2010
S44	Generator Electrical Room 2-2	POINT	406407.58	3447034.7	14.9	11.28	774.25	44.24	0.30	6.37E-02	7.27E-04	0.00E+00	(on or before) June 2010
S45	Generator Electrical Room 2-3	POINT	406399.75	3447024.9	14.9	11.28	774.25	44.24	0.30	6.37E-02	7.27E-04	0.00E+00	(on or before) June 2010
S46	Generator Electrical Room 4	POINT	406187.44	3446826.8	14.9	6.71	774.25	44.24	0.30	6.37E-02	7.27E-04	0.00E+00	(on or before) June 2010
S47	Primary Diesel Pump 1	POINT	406553.97	3447046.8	14.9	2.74	787.55	111.28	0.15	3.04E-02	3.47E-04	0.00E+00	(on or before) June 2010
S48	Primary Diesel Pump 2	POINT	406561.49	3447042.1	14.9	2.74	787.55	111.28	0.15	3.04E-02	3.47E-04	0.00E+00	(on or before) June 2010
S49	Primary Diesel Pump 3	POINT	406567.35	3447036.3	14.9	2.74	787.55	111.28	0.15	3.04E-02	3.47E-04	0.00E+00	(on or before) June 2010
S50	Secondary Diesel Pump 1	POINT	406582.71	3447019.1	14.9	2.74	719.15	6.85	0.15	9.54E-03	1.09E-04	0.00E+00	(on or before) June 2010
S51	Secondary Diesel Pump 2	POINT	406588.57	3447011.3	14.9	2.74	719.15	6.85	0.15	9.54E-03	1.09E-04	0.00E+00	(on or before) June 2010
S52	Secondary Diesel Pump 3	POINT	406596.4	3447001.5	14.9	2.74	719.15	6.85	0.15	9.54E-03	1.09E-04	0.00E+00	(on or before) June 2010
S53	Diesel Gen. Line 3	POINT	405555.73	3446230.6	14.9	3.66	774.25	63.71	0.25	6.37E-02	7.27E-04	0.00E+00	(on or before) June 2010
S54	Diesel Gen Line 4	POINT	405502.49	3446280.3	14.9	3.66	774.25	63.71	0.25	6.37E-02	7.27E-04	0.00E+00	(on or before) June 2010
S55	Building 901 Emergency Generator	POINT	405449.26	3446500.3	14.9	2.44	766.05	102.65	0.14	2.26E-02	2.57E-04	0.00E+00	(on or before) June 2010
S56	Permanent Data Center Generator	POINT	405474.1	3446826.8	14.9	3.81	783.05	146.10	0.15	4.55E-02	5.19E-04	0.00E+00	(on or before) June 2010
S57	Temporary Data Center Generator	POINT	405094.37	3446535.8	14.9	2.54	773.15	66.32	0.15	1.71E-02	1.95E-04	0.00E+00	(on or before) June 2010
S58A	Dispatch Center Generator - Stack 1	POINT	405101.98	3446542	14.9	3.35	834.15	63.23	0.15	1.71E-02	1.95E-04	0.00E+00	(on or before) June 2010
S58B	Dispatch Center Generator - Stack 2	POINT	404789.16	3445950.2	14.9	3.35	834.15	63.23	0.15	1.71E-02	1.95E-04	0.00E+00	(on or before) June 2010
SXX1	Fueling Station Generator	POINT	405140.5	3445414.4	14.9	2.29	868.15	39.14	0.07	3.05E-03	3.48E-05	0.00E+00	After October 2010

Table B-1 Existing AM/NS Sources		Location and Stack Parameters								Potential to Emit			Date Operation Began
Source ID	Description	Type	UTMx	UTMy	Base Elevation	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)	PM25 ST (g/s)	PM25 LT (g/s)	NO2 (g/s)	
PHEGEN1	Pump House EGEN 1	POINT	406766.95	3446763.6	14.9	4.57	761.15	99.48	0.15	2.30E-02	2.62E-04	0.00E+00	(on or before) June 2010
PHEGEN2	Pump House EGEN 2	POINT	406773.59	3446769	14.9	4.57	761.15	99.48	0.15	2.30E-02	2.62E-04	0.00E+00	(on or before) June 2010
S4EGEN	S4 Emergency Pump	POINT	405360.54	3446564.2	14.9	2.44	766.05	86.25	0.15	2.01E-02	2.30E-04	0.00E+00	(on or before) June 2010
ESEGEN	Electrical Substation EGEN	POINT	406247.36	3446476.2	14.9	1.32	1189.15	124.19	0.05	2.54E-03	2.90E-05	0.00E+00	After October 2010
NGFWP	NG General Controls Fire Water Pump	POINT	406777.74	3446769.2	14.9	2.13	788.71	206.77	0.05	3.03E-03	3.45E-05	0.00E+00	(on or before) June 2010

(1) PM_{25} emissions based on actual 2-year emissions per Appendix W

Table B-2: $PM_{2.5}$ 2-Year Average Actual Emissions Calculations for Selected Exisiting AM/NS Sources

Parameter	S12	S5	S5A	S6	S7	S36
	Continuous Pickling Line #1 - Tandem Mill with Mist Eliminator	**Finishing Mill with Wet ESP**	**Roughing Mill with Wet ESP**	**Continuous Pickling Line #1 - Processor/Stretcher/Leveler with Baghouse**	**Continuous Pickling Line #2 - Processor/Stretcher/Leveler with Baghouse**	**Skin Pass Mill with Mist Eliminator**
Year 2022 Operating hours	6902	7281	7281	6902	5963	114
Year 2022 PM2.5 Emissions (tpy)	4	14.32	4.29	7.11	6.14	0.037
Year 2023 Operating hours	7684	7496	7496	7684	6568	126
Year 2023 PM2.5 Emissions (tpy)	3.93	14.74	4.42	7.91	6.76	0.042
Year 2022+2023 Operating hours	14586	14777	14777	14586	12531	240
Year 2022+2023 Hours	17520	17520	17520	17520	17520	17520
Year 2022+2023 PM2.5 Emissions (US tons)	7.93	29.06	8.71	15.02	12.9	0.079
Actual 2 yr average emission rate (tpy)	3.9650	14.5300	4.3550	7.5100	6.4500	0.0395
Actual 2 yr average emission rate (lb/hr)	1.0873	3.9331	1.1789	2.0595	2.0589	0.6583
Peak (short-term) Actual 2 yr average emission rate (g/s)	**1.37E-01**	**4.96E-01**	**1.49E-01**	**2.59E-01**	**2.59E-01**	**8.30E-02**
Annualized Actual 2 yr average emission rate (g/s)	**1.14E-01**	**4.18E-01**	**1.25E-01**	**2.16E-01**	**1.86E-01**	**1.14E-03**
Allowable emissions (g/s)	1.79E+00	8.89E-01	2.67E-01	3.80E-01	3.80E-01	1.50E-01

APPENDIX C MERPS HYPOTHETICAL SOURCE AND OZONE MONITOR JUSTIFICATION

The following sections provide justification for using the Autauga County, Alabama MERPs hypothetical source for the AMC Calvert PSD modeling analysis.

C-1-1: PROXIMITY AND METEOROLOGICAL INFLUENCES

The Autauga hypothetical source is located about 212 km northeast of the facility and is the nearest to the Project. The next closest hypothetical sources are in Bay County, Florida (around 248 km southeast of the site), and in Orleans, Louisiana (approximately 213 km southwest of the site). These coastal locations are likely heavily influenced by marine airmasses and meteorology, which can affect the resulting photochemical processes used to develop MERPs. Given the project site is about 50 km away from Mobile Bay, marine influences are not representative of the project site. The other hypothetical source in Alabama is Tallapoosa, but it about 280 km to the northeast of the Project and was deemed too distant to be representative.

C-1-2: TERRAIN AND LANDUSE

Both the Autauga region, shown in Figure C-1, and the Project (Figure 5-3) are in rural settings with some industrialized/urban areas nearby. Therefore, the Autauga hypothetical source is the most representative source for the analysis of ozone and secondary $PM_{2.5}$ MERPs. Figures C-2 and C-3 show topographical maps of the AMC Project and Autauga hypothetical source with 2-km radii, respectively. Autauga is situated at a slightly higher elevation (96 meters) with the terrain dominated by low rolling hills. The Project is at a lower elevation (15 meters) but also features rolling hills, especially to the west of the facility. Therefore, terrain at both locations justifies the hypothetical source selection.

C-1-3: STACK HEIGHTS

Most of the AMC PSD Project sources' release heights are between 10 and 35 m. The Autauga hypothetical source was run at 10 and 90 m, and 10 m was chosen as the most representative. Therefore, secondary $PM_{2.5}$ calculations should be suitably conservative against the Project sources.

FIGURE C-1: AERIAL IMAGERY SURROUNDING AUTAUGA HYPOTHETICAL SOURCE

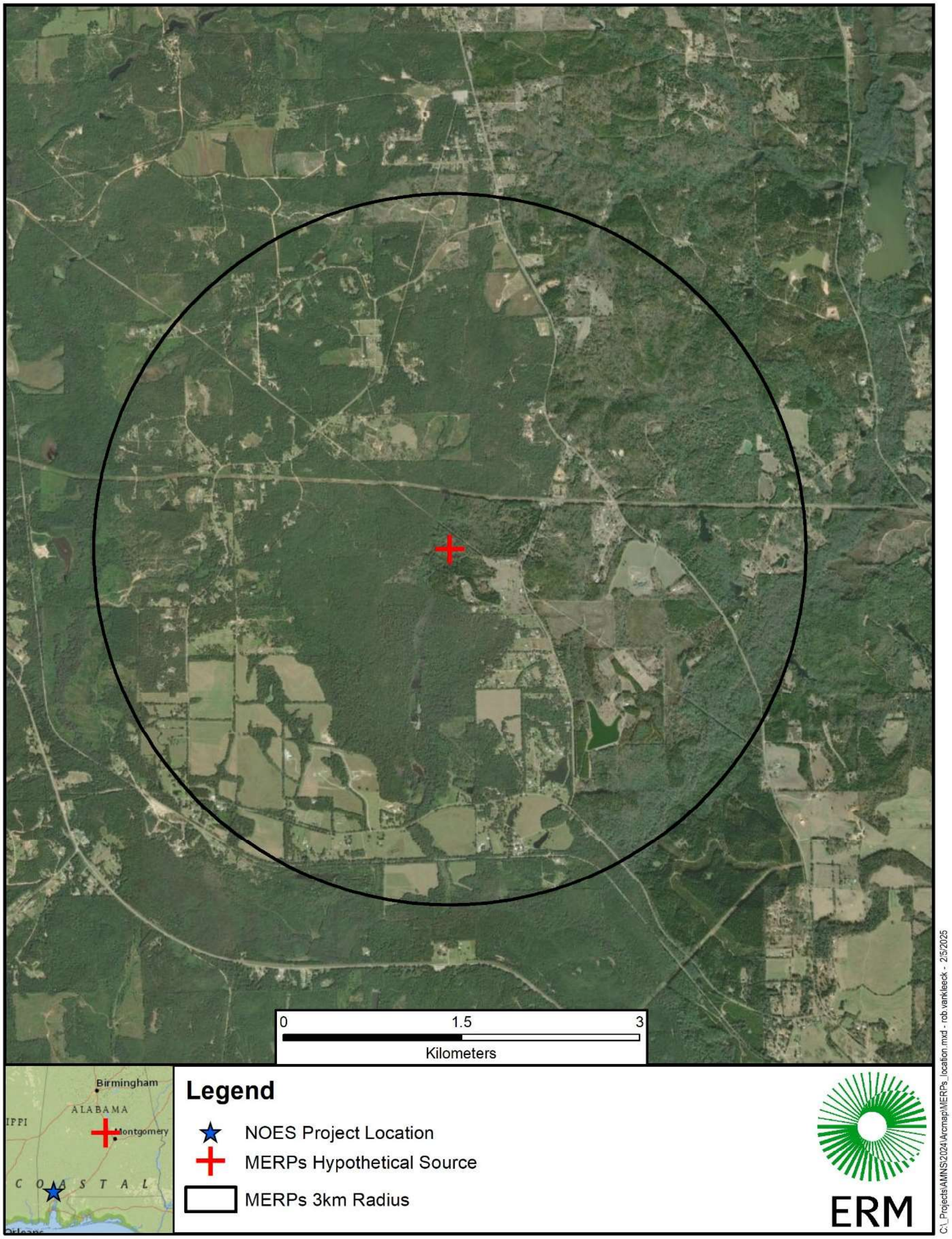


FIGURE C-2: TOPOGRAPHICAL MAP OF AMC PROJECT SITE

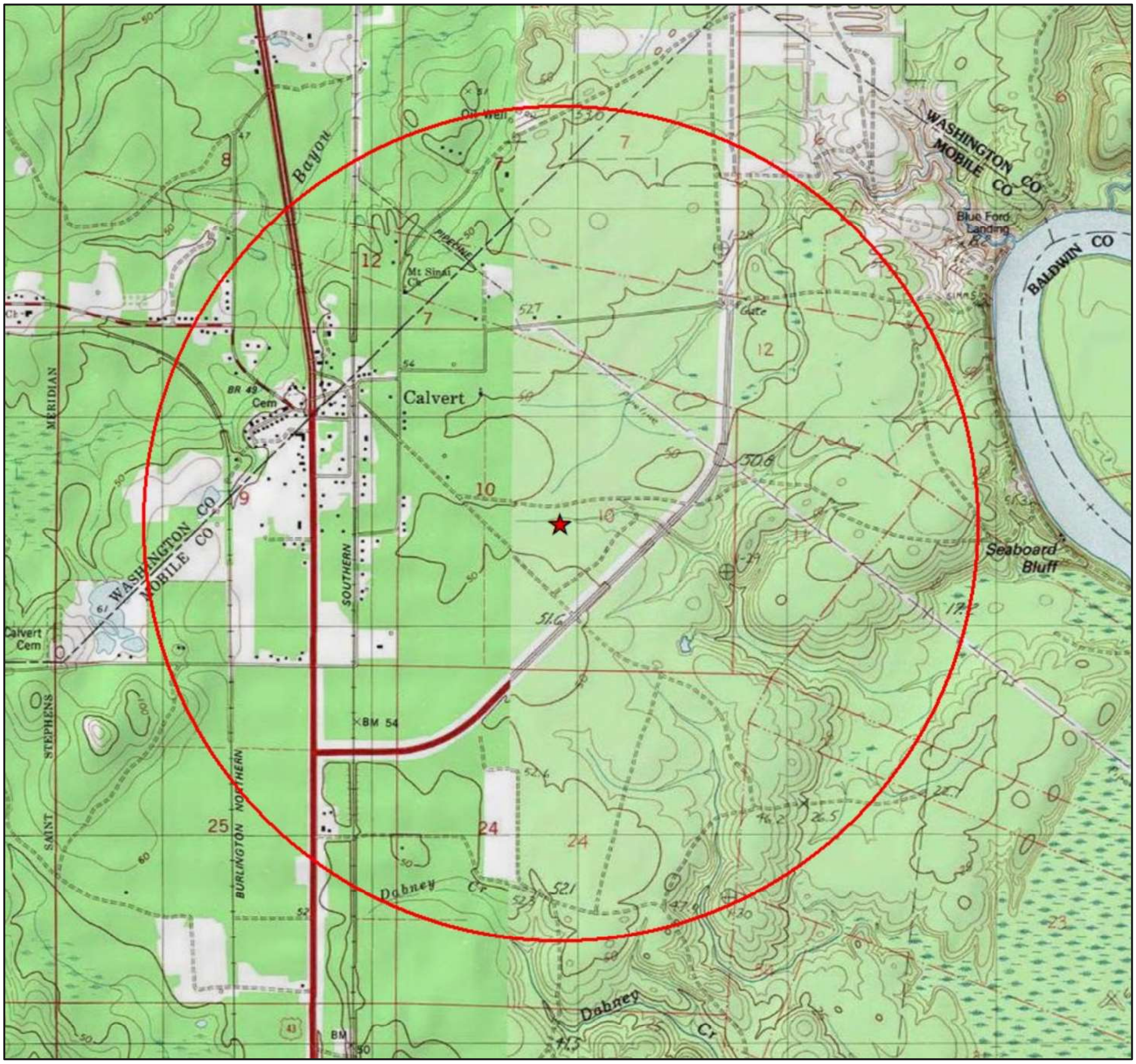
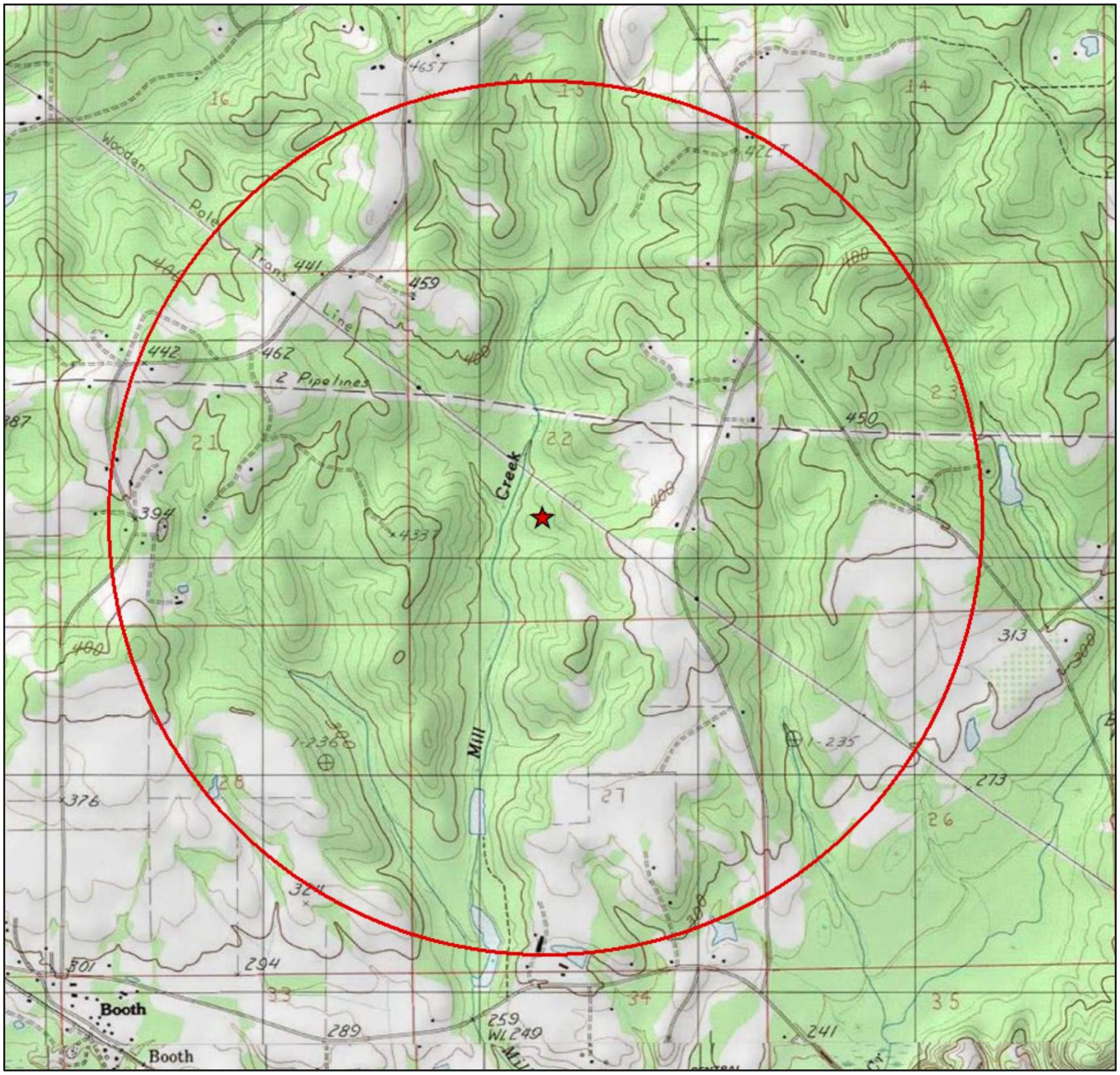


FIGURE C-3: TOPOGRAPHICAL MAP OF AUTAUGA HYPOTHEICAL SOURCE



C-4: Chickasaw Ozone Monitor Justification

The following sections provide justification for using the Chickasaw monitor (ID: 01-097-0003) ozone data for the AMC Calvert PSD modeling analysis.

C-2-1: PROXIMITY AND METEOROLOGICAL INFLUENCES

The Chickasaw monitor is located about 41 km south of the facility and is the nearest to the Project. The next closest active ozone monitor is the Fairhope Alabama monitor, located about 71 km south of the Project. This is significantly closer to the Gulf of Mexico and is likely more heavily influenced by marine airmasses and meteorology than the Chickasaw monitor. Furthermore, the Chickasaw monitor is roughly in the same direction from the Project as the Fairhope monitor, so any downwind impacts from the Mobile metropolitan area would be more representative in the Chickasaw data. The other ozone monitors not in the Mobile metropolitan area are over 130km away to the north and were deemed too distant to be representative.

C-2-2: TERRAIN AND LANDUSE

The Chickasaw monitor is in the northern suburbs of the Mobile Metropolitan area – a more densely populated area than the Project. However, this will provide suitably conservative measurements for use in PSD modeling. The monitor sits at roughly 7.62 meters elevation, which is close to the Project (15 meters).

APPENDIX D ADEM APPROVED PROTOCOL AND COVER LETTER

March 24, 2025

Ms. Jennifer Youngpeter
Alabama Department of Environmental
Management
Air Division
1400 Coliseum Blvd.
Montgomery, AL 36110

RE: AM Calvert, LLC - Carbon Steel Mill
Prevention of Significant Deterioration (PSD) Modeling Report Addendum
NOES Facility

Dear Ms. Youngpeter:

AM Calvert, L.L.C. (AM) is submitting this approved PSD modeling protocol and additional information in support of the previously submitted, on February 27, 2025, Prevention of Significant Deterioration (PSD) modeling report. This additional information highlights the changes in emissions from the protocol to the application at ADEM's request. Table D-1 shows the sources with changes in emissions; all other sources have identical emissions to the approved protocol below. Values that are now different are **bolded.**

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19801 DE, United States
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Table D-1: Changes in Emissions from Approved Protocol

Source ID	PM10	PM2.5	NOx	PM10	PM2.5	NOx
	Protocol Emission Rate (g/s)			New Report Emission Rate (g/s)		
PICKL	2.500E-02	2.500E-02	0.000E+00	**4.450E-02**	**3.900E-02**	0.000E+00
AEAL1	8.850E-02	8.850E-02	7.670E-01	8.850E-02	8.850E-02	**5.900E-01**
SPRY_R	1.583E-02	1.583E-02	8.889E-02	**8.889E-03**	**8.889E-03**	8.889E-02
SHOT_B	8.500E-02	8.500E-02	0.000E+00	**1.214E-02**	**1.214E-03**	0.000E+00
CRM_1	4.958E-03	4.958E-03	0.000E+00	**2.887E-01**	**1.877E-01**	0.000E+00
CRM_2	4.958E-03	4.958E-03	0.000E+00	**2.887E-01**	**1.877E-01**	0.000E+00
OXIDE	5.181E-02	2.897E-02	0.000E+00	**3.886E-02**	**3.760E-02**	0.000E+00
TNK_FM	1.299E-01	1.267E-01	0.000E+00	**2.598E-02**	**2.539E-02**	0.000E+00
HYPU_A1	0.000E+00	0.000E+00	2.930E-02	0.000E+00	0.000E+00	**2.762E-02**
HYPU_A2	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**
HYPU_A3	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**
HYPU_A4	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**
HYPU_A5	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**
HYPU_B1	0.000E+00	0.000E+00	2.930E-02	0.000E+00	0.000E+00	**2.762E-02**
HYPU_B2	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**
HYPU_B3	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**
HYPU_B4	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**
HYPU_B5	0.000E+00	0.000E+00	4.884E-02	0.000E+00	0.000E+00	**4.603E-02**

If you have any questions regarding this submittal or need further information, please do not hesitate to contact Jacqueline Gorski at (251) 225-0475.

Sincerely,

Keith Howell, COO, AM Calvert, L.L.C.

cc: US EPA Region 4

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Prevention of Significant Deterioration (PSD) Permit

Air Dispersion Modeling Protocol

PREPARED FOR

AMC Calvert

DATE
10 December 2024

REFERENCE
0721801

SIGNATURE PAGE

Prevention of Significant Deterioration (PSD) Permit

Air Dispersion Modeling Protocol

0721801

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1. INTRODUCTION

ArcelorMittal, the parent company of ArcelorMittal LLC (AMC) and AM/NS Calvert LLC (AM/NS) owns and operates the latter, a carbon steel mill located in Calvert, Alabama. This application is for the new, greenfield electrical steels mill to be owned by ArcelorMittal Calvert. AMC, LLC (AMC) owns and operates a carbon steel mill located in Calvert, Alabama. The facility was previously owned and operated by ThyssenKrupp Steel USA, L.L.C. (TKS). TKS submitted Prevention of Significant Deterioration (PSD) permit applications for the carbon steel mill and obtained construction authorizations via PSD permits issued by the Alabama Department of Environmental Management (ADEM). Initial operation of certain sources at the facility commenced in June 2010 under Temporary Authorizations to Operate (TAOs) issued by ADEM. As per Alabama Administrative Code (AAC) 335-3-16-.04(1), an initial Title V operating permit application was submitted within 12 months after the commencement of operations. AM/NS Calvert acquired the facility in February of 2014, and filed the necessary transfer of ownership notifications. The most recent Title V permit was issued by ADEM on October 22, 2021 (Permit/Facility Number 503-0095).

AMC is submitting this application to request authorization for the following changes:

Construction of an Electrical Steels Processing facility, with input raw material, hot rolled coils, will be provided by the AM/NS Calvert Hot Strip Mill.

- One (1) Annealing Furnace;
- One (1) Pickling Line Scrubber;
- Two (2) Natural Gas-Fired Boilers;
- Two (2) Natural Gas-Fired Ovens each controlled by a Regenerative Thermal Oxidizer;
- One (1) Shot Blaster Baghouse;
- Two (2) Cold Rolling Mills;
- One (1) Spray Roaster Operation with Iron Oxide Bins with Bag filters;
- One (1) Tank Farm Scrubber.

The Project will include installation of auxiliary equipment including one (1) new contact cooling tower, an annealing and pickling line cooling section, annealing and coating line cleaning sections, quenching operations, and hydrogen purging.

The modeling protocol is organized as follows:

- Section 1.1 - Facility Description;
- Section 1.2 - Description of Proposed Changes;
- Section 2 - Summary of Emission Calculations;
- Section 3 - PSD applicability analysis;
- Section 4 – Applicable Air Quality Standards;
- Section 5 – Air Quality Dispersion Model;

- Section 6 – Emission Inventory Data;
- Section 7 – Meteorological Data;
- Section 8 – Receptor Grid;
- Section 9 – Ambient Background Concentrations;
- Section 10 – Air Quality Impact Analysis;
- Section 11 – Impact on PSD Class I Areas
- Appendix A – SIL Modeling Results Figures
- Appendix B – MERPs Hypothetical Source and Ozone Monitor Justification

A report of air dispersion modeling analyses conducted to support this PSD permit application will be submitted to ADEM separately.

1.1 FACILITY DESCRIPTION

This new facility manufactures and processes Non-Grain Oriented Electrical Steel (NOES), a carbon steel product, targeted for high-value applications by manufacturers in North America and throughout the North American Free Trade Agreement (NAFTA) region. The facility can produce various grades and/or types of steel strips in various forms, such as coils and slits. with various coatings, finishes, and properties for general industrial use. Much of the product is consumed by the automotive industry.

The proposed project will achieve superior quality on magnetic and mechanical properties, which can be tailored to a variety of final end-use applications. The production line will focus on high-end, electric vehicle grade NOES. The processing route can be best described as follows.

- Annealing & Pickling Line (APL): Hot Rolled Coil (HRC) is first processed at the APL to anneal the strip (controlled heating cycle) and then remove the surface oxide (scale) layer, which forms as a regular aspect of steel production. The APL is a continuous process that ensures consistency of quality and process yield.
- Cold Rolling Mill (CRM): The annealed and pickled coils are then rolled at the CRM to reduce the strip to the final substrate thickness for the end product.
- Annealing & Coating Line (ACL): The full-hard cold rolled coils are then processed through the continuous ACL, where the strip is annealed, and a thin coating is applied. This results in a final strip product with the required properties for the end-use applications.
- Slitting and Packaging: Coils from the ACL can be further processed on a precision slitting line to provide the final product at a specific width, according to customer requirements.
- The ARP processes ferrous chloride solution (FCS) produced by the pickling lines to regenerate hydrochloric acid (HCl) and produces solid iron oxide (Fe_2O_3).

A detailed description of the changes proposed in this permit application will be provided with the application package.

The Project approximate central location is at UTM X = 405129.82 meters, UTM Y = 3444724.8 meters, Zone 16, NAD83. This coordinate will be used as a center point to determine the significance radius.

The proposed site will be graded to about 49 feet. For modeling purposes, all Project sources and buildings are assumed to be at 49 feet.

2. EMISSION CALCULATIONS

A summary of the Potential To Emit (PTE) from the proposed Project is provided in Table 2-1. The specific emission calculation details will be included in the PSD application package.

TABLE 2-1 SUMMARY OF PROJECT EMISSIONS

Project Potential to Emit	
Pollutant	**Annual Emissions Rate (tpy)**
PM	25.68
PM_{10}	25.68
$PM_{2.5}$	23.65
CO	73.58
SO_2	0.58
NO_x	65.20
VOC	63.31
HCI	7.24
Chlorine	4.47
Total HAP	13.17

3. PSD APPLICABILITY ANALYSIS

AMC is located in Mobile County, which is currently designated as being in attainment of all National Ambient Air Quality Standards (NAAQS). Because the plant is located in an attainment area, Nonattainment New Source Review (NNSR) would not currently apply to this Project. Therefore, the only New Source Review (NSR) mechanism considered in this analysis is PSD.

PSD applies to new major stationary sources or major modifications at existing major stationary sources located in NAAQS attainment or unclassifiable areas. AMC is an existing major stationary source in an attainment area. Per ADEM Administrative Code (AAC) 335-3-14-.04(2)(b), a major modification at an existing major stationary source is defined as follows:

"Major modification shall mean any physical change in or change in the method of operation at a major stationary source that would result in a significant net emissions increase of any regulated NSR pollutant."

A summary of the applicability analysis of PSD to the proposed Project is presented below.

3.1 PSD APPLICABILITY ANALYSIS – PROPOSED PROJECT

As the melt shop Project involves construction of new emission sources, the Project qualifies as a physical change and the proposed Project emissions were compared to the PSD "Significant Emission Rate (SER)" of subject pollutants to determine if the Project constitutes a major modification to an existing major source facility. The results of this comparison are presented in Table 3-1 below.

TABLE 3-1 PSD APPLICABILITY ANALYSIS

Pollutant	Annual Emissions Rate (tpy)	PSD SER (tpy)	PSD Review Triggered?
PM	25.68	25	Yes
PM_{10}	25.68	15	Yes
$PM_{2.5}$	23.65	10	Yes
CO	73.58	100	No
SO_2	0.58	40	No
NO_x	65.20	40	Yes
VOC	63.31	40	Yes
Lead	4.56E-04	0.6	No
Ozone	NO_x: 65.20	NO_x: 40	Yes
	VOC: 63.31	VOC: 40	

As shown in Table 3-1, the net emissions increase of PM, PM_{10}, $PM_{2.5}$, NO_x and VOC are greater than the respective PSD SERs and therefore, these pollutants are subject to PSD review. For

Projects that trigger PSD permitting requirements, the following items are required to be addressed in the permit application:

- Determination of BACT for each pollutant which triggers PSD review;
- National Ambient Air Quality Standards (NAAQS) and PSD Increment Air Quality analysis;
- Additional Health Impact Analysis; and
- Class I Area impact analysis.

The detailed BACT analysis will be included in the PSD application package. As noted earlier, detailed modeling results for pollutants subject to PSD review will be provided in a separate submittal.

4. APPLICABLE AIR QUALITY STANDARDS

Air quality impact analyses to support the proposed modification will be performed to demonstrate compliance with the NAAQS and PSD increment standards for the averaging periods and criteria pollutants listed in Table 4-1. Project-only significant impact level (SIL) modeling was performed for each of these standards and subsequent cumulative will be performed for pollutants and averaging periods for which the respective SIL has been exceeded. The SIL modeling will also be used to assess if any pre-constructive modeling is necessary by comparing against the Significant Monitoring Concentration (SMC). The SILs, NAAQS, SMC and PSD Increment thresholds are presented in Table 4-1.

The SIL modeling results are presented in Table 4-2. Appendix A shows the contour plots and SIAs. The peak concentrations for all pollutants and averaging periods exceed their respective SILs with the peak concentrations occurring on the fenceline with 100-meters resolution, and concentrations decreasing towards the edge of the grid. As requested by the ADEM, a SIL modeling archive is provided along with this protocol.

TABLE 4-1 APPLICABLE NAAQS AND PSD INCREMENT LEVELS

Pollutant	Averaging Period	SIL[a] (μg/m³)	SMC[a] (μg/m³)	NAAQS (μg/m³)	PSD Class II Increment (μg/m³)
Nitrogen Dioxide (NO_2)	1 hour	7.5[c]	N/A	188[d]	Not Established
	Annual	1	14	100[a]	25
Particulate Matter less than 10 microns (PM_{10})	24-hour	5	10	150[e]	30[b]
	Annual	1	N/A	Revoked	17[a]
Particulate Matter less than 2.5 microns ($PM_{2.5}$)	24-hour	1.2	[f]	35[i]	9[b]
	Annual	0.13	N/A	9[a]	4[a]
Ozone	8-hour	1 ppb	N/A	70 ppb	N/A

a The maximum high 1st-high predicted concentration modeled over five years of meteorological data.

b Not to be exceeded more than once per year.

c U.S. EPA interim SIL, based on SIL of 4 ppb, recommended in the U.S. EPA Memorandum, *Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program*, June 29, 2010.

d Five year average high-8th-high of the maximum daily 1-hour concentrations.

e High sixth high over five years of concatenated meteorological data.

f $PM_{2.5}$ SMC was vacated and remanded on January 22, 2013 by the United States District Court, D.C. Circuit.

i Five year average high-8th-high of the maximum daily concentrations.

TABLE 4-2 SIL MODELING RESULTS

Pollutant	Averaging Period	SIL (µg/m³)	SMC (µg/m³)	Model-Predicted Peak Conc. (µg/m³)	% of the SIL	SIA [(1)] (km)	Location of Peak Conc.
NO_2	1 hour	7.5	N/A	39.48	526%	10.23	Fence, 100-m spacing
	Annual	1	14	1.80	180%	0.75	Fence, 100-m spacing
PM_{10}	24-hour	5	10	5.09	102%	0.54	Fence, 100-m spacing
	Annual	1	N/A	1.11	111%	0.35	Fence, 100-m spacing
$PM_{2.5}$ (with secondary)	24-hour	1.2	N/A	4.07[(2)]	339%	2.50	Fence, 100-m spacing
	Annual	0.13	N/A	0.86[(2)]	665%	2.19	Fence, 100-m spacing

(1) The SIA center point is based on UTM X=405129.82 meters and UTM Y = 3444724.8 meters, UTM Zone 16, NAD83.

(2) $PM_{2.5}$ 24-hour secondary: 0.025 (µg/m³), $PM_{2.5}$ annual secondary: 0.001 (µg/m³). These values were added to the primary 24-hour and annual $PM_{2.5}$ modeling results, respectively. The calculations for these values are shown in Section 10.6.

5. AIR QUALITY DISPERSION MODEL

5.1 MODEL OPTIONS

Per ADEM modeling guidelines [1], the air quality modeling analyses will employ the latest EPA guideline models. The latest AMS/EPA Regulatory Model (AERMOD) version is 24142. The following settings are proposed for use in the AERMOD model:

- terrain represented by receptor elevations and hill height scales
- regulatory default model parameters, including:
  - calm correction
  - buoyancy induced dispersion
  - stack-tip downwash
  - direction specific building downwash
  - final plume rise
  - default wind profile coefficients
  - default vertical potential temperature gradients.

AERMOD allows for simulation of multiple sources (and source types) simultaneously, while making the correct accounting for building downwash and building cavity effects.

In October 2004, the USEPA released an updated Building Profile Input Program (BPIP) that utilizes the **P**lume **Ri**se **M**odel **E**nhancements or "PRIME" algorithms. The BPIPPRM (version 04274) program contains improved plume rise and building downwash algorithms to determine wind direction - dependent building dimensions.

5.2 BUILDING DOWNWASH

The BPIPPRM program builds a mathematical representation of each building to determine Projected building dimensions and its potential zone of influence. These calculations are performed for 36 different wind directions (at 10 degree intervals). For example, the BPIPPRM building dimensions for a wind direction orientation of 30 degrees are used for wind directions between 26 and 35 degrees. If the BPIPPRM program determines that a source is under the influence of several potential building wakes, the structure or combination of structures which has the greatest influence ($h_b + 1.5\ L_b$) will be selected for input to the AERMOD model. Building dimensions will be input to the model for the AMC mill. The locations and dimensions for the structures associated with the Project sources have not been finalized yet and will be provided in the report. Figure 5-1 illustrates the mill emission sources in relation to building structures considered in the downwash analysis. Figure 5-2 shows the Project structures relative to the wider AM/NS facility and the existing structures that will be included in the cumulative modeling. Table 5-1 summarizes the downwash analysis and associated dominant buildings determined by BPIPPRM. Table 5-2 summarizes all the structures considered in the downwash analysis.

1 PSD Air Quality Analysis Modeling Guidelines, ADEM, March 2024

Downwash inputs from nearby offsite sources will be provided by ADEM and included in the cumulative modeling.

Good Engineering Practice (GEP) stack height analysis will be conducted to demonstrate that stack heights comply with USEPA's GEP stack height regulations and will therefore be modeled at their actual height.

TABLE 5-1 DOWNWASH ANALYSIS AS DETERMINED BY BPIP

Source ID	Controlling Structure	Effective Building Height (m)	Maximum Projected Width (m)	Approximate Distance to Stack (m)	5L Distance (m)	GEP Equation Stack Height (m)
COOL_1	ACL1	28.49	338.90	246.20	134.10	70.22
COOL_2	ACL1	28.49	342.28	231.44	134.10	70.22
COOL_3	ACL1	28.49	340.59	215.53	134.10	70.22
COOL_4	ACL1	28.49	343.96	200.49	134.10	70.22
PICKL	ACL1	28.49	157.78	93.24	134.10	70.22
BOIL_1	ACL1	28.49	159.92	225.60	134.10	70.22
BOIL_2	ACL1	28.49	159.92	236.58	134.10	70.22
RTO_1	ACL1	28.49	32.00	0.00	134.10	70.22
RTO_2	ACL1	28.49	127.49	229.09	134.10	70.22
AEAL1	ACL1	28.49	149.18	225.24	134.10	70.22
SPRY_R	ACL1	28.49	337.19	108.22	134.10	70.22
SHOT_B	ACL1	28.49	159.92	172.65	134.10	70.22
CLEAN_1	ACL1	28.49	32.00	0.00	134.10	70.22
CLEAN_2	ACL1	28.49	127.50	28.59	134.10	70.22
CRM_1	ACL1	28.49	298.21	103.75	134.10	70.22
CRM_2	ACL1	28.49	47.71	72.00	134.10	70.22
OXIDE	ACL1	28.49	342.28	97.80	134.10	70.22
TNK_FM	ACL1	28.49	385.29	105.00	134.10	70.22
ACL_C1	ACL1	28.49	32.00	0.00	134.10	70.22
ACL_C2	ACL1	28.49	127.49	25.50	134.10	70.22
QUEN_1	ACL1	28.49	32.00	0.00	134.10	70.22

Source ID	Controlling Structure	Effective Building Height (m)	Maximum Projected Width (m)	Approximate Distance to Stack (m)	5L Distance (m)	GEP Equation Stack Height (m)
QUEN_2	ACL1	28.49	125.31	25.50	134.10	70.22
HYPU_A1	ACL1	28.49	32.00	0.00	134.10	70.22
HYPU_A2	ACL1	28.49	32.00	0.00	134.10	70.22
HYPU_A3	ACL1	28.49	32.00	0.00	134.10	70.22
HYPU_A4	ACL1	28.49	32.00	0.00	134.10	70.22
HYPU_A5	ACL1	28.49	32.00	0.00	134.10	70.22
HYPU_B1	ACL1	28.49	125.31	25.50	134.10	70.22
HYPU_B2	ACL1	28.49	125.31	25.50	134.10	70.22
HYPU_B3	ACL1	28.49	123.13	25.50	134.10	70.22
HYPU_B4	ACL1	28.49	123.12	25.50	134.10	70.22
HYPU_B5	ACL1	28.49	123.12	25.50	134.10	70.22

TABLE 5-2 TABLE OF BUILDINGS ASSOCIATED WITH THE PROJECT

Building ID	Building Tier Height (m)	Building X-Length (m)	Building Y-Length (m)	Reference Corner Coordinate UTM X (m)	Reference Corner Coordinate UTM Y (m)
ACL1	28.49	32.00	515.00	405051.66	3444572.44
ACL2	27.66	32.00	515.00	405101.24	3444547.00
APL	25.79	32.00	515.00	405023.43	3444587.47
INC_CS	19.42	35.50	118.85	405353.59	3444995.54
COIL_S	23.53	33.27	131.00	405102.58	3444507.45
RCM	21.16	28.05	131.00	405089.40	3444482.67
EMUL	20.82	33.27	36.00	404986.91	3444568.94
RCM_R	21.16	28.05	47.97	404973.74	3444544.17

FIGURE 5-1 PROJECT SOURCES AND STRUCTURE LOCATION FOR DOWNWASH ANALYSIS

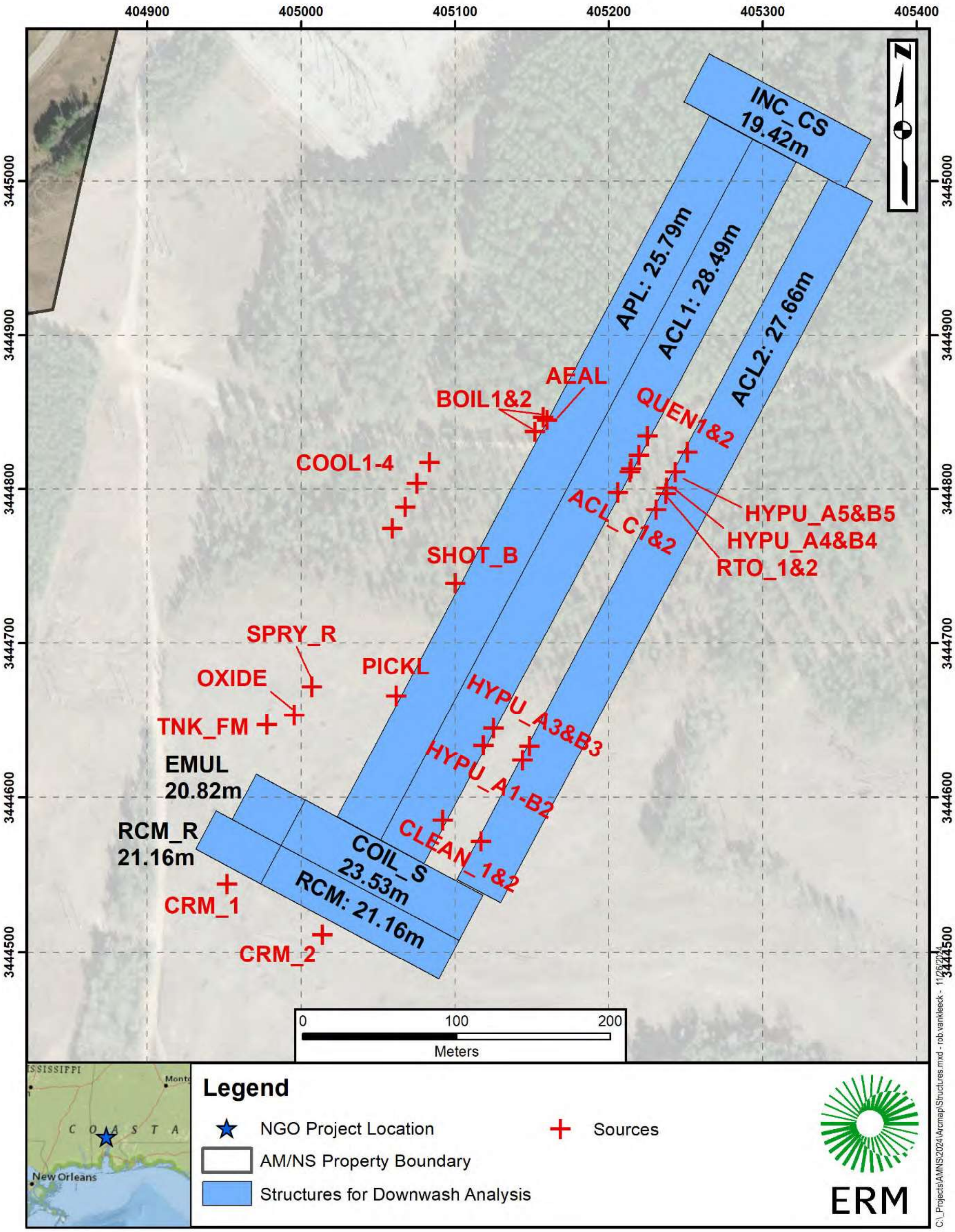
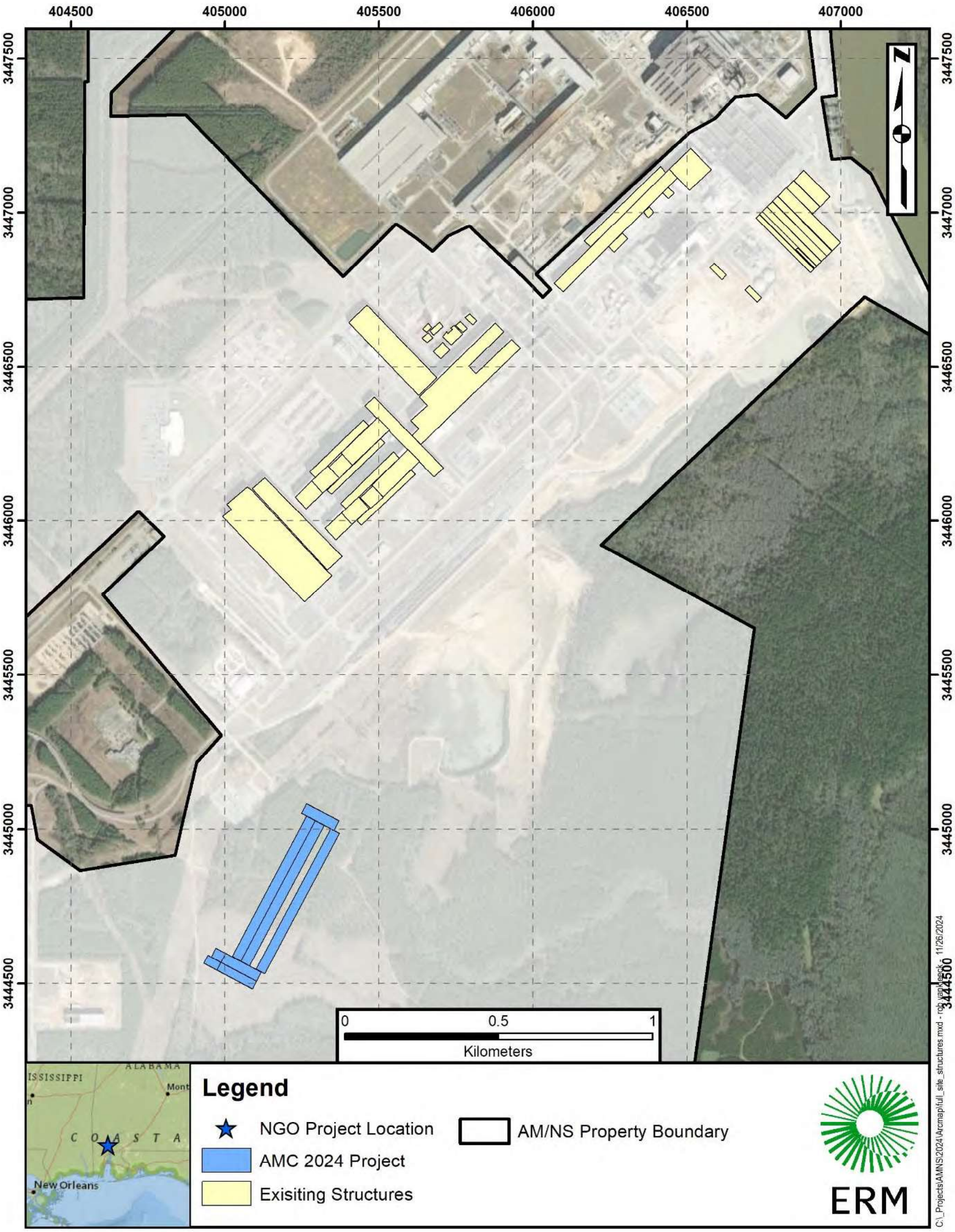


FIGURE 5-2 PROJECT AND EXISITING AM/NS STRUCTURES FOR CUMULATIVE MODELING



5.3 LAND USE

The selection of either rural or urban dispersion coefficients will follow the procedures listed in 40 CFR 51 Appendix W Section 7.2.1. The preferred Land Use procedure classifies the land use within a 3-km radius circle around the Project site using the Auer land use typing scheme. If the urban Auer land use types I1, I2, C1, R2, and R3 (Industrial, Commercial, and Compact Residential) account for 50 percent or more of the area within 3-km of the site, urban dispersion coefficients should be used. Sources located in areas defined as rural should be modeled using the rural dispersion parameters.

AERSURFACE (version 24142) was used to analyze 2021 NLCD land cover data within 3-km of the Project site. The NLCD data is displayed in Figure 5-2. The NLCD land use categories 23 (Developed, Medium Intensity) and 24 (Developed, High Intensity) are equivalent to the urban Auer land use types. The land use analysis indicates that more than 87 percent of the area around the site is rural (Table 5-3). Based on this assessment, the site will be characterized as rural in the modeling.

In addition, inspection of the land use on aerial photo around 3 kilometers around the Project (Figure 5-3) also confirms rural dispersion is appropriate for this Project.

TABLE 5-3 LAND USE ANALYSIS AROUND 3-KM RADIUS OF THE PROJECT

2021 NLCD Category	Description	Area (km^2)	Percent
11	Open Water	0.24	0.84%
21	Developed, Open Space	1.12	3.96%
22	Developed, Low Intensity	1.80	6.36%
23	Developed, Medium Intensity	2.41	8.51%
24	Developed, High Intensity	1.18	4.18%
31	Barren Land (Rock/Sand/Clay)	0.48	1.69%
41	Deciduous Forest	0.07	0.24%
42	Evergreen Forest	10.25	36.24%
43	Mixed Forest	1.23	4.35%
52	Shrub/Scrub	1.16	4.11%
71	Grasslands/Herbaceous	0.59	2.09%
81	Pasture/Hay	0.16	0.57%
90	Woody Wetlands	6.76	23.93%
95	Emergent Herbaceous Wetland	0.83	2.93%
	Total:	28.27	**100.0%**
	Total Rural:	24.69	87.32%
23 + 24	**Total Urban:**	3.59	12.68%

FIGURE 5-3 LAND USE WITHIN 3-KM RADIUS AROUND THE PROJECT SITE

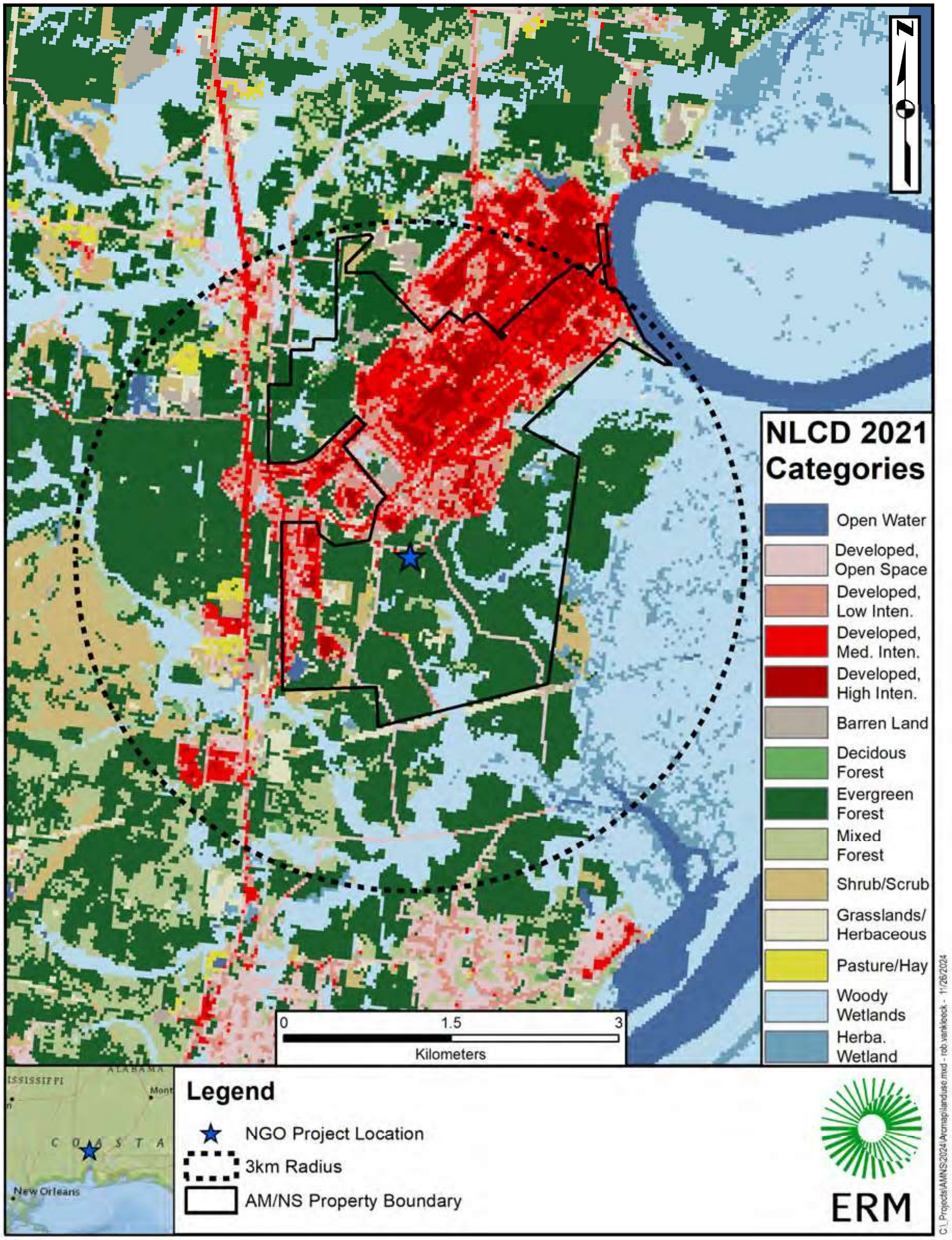
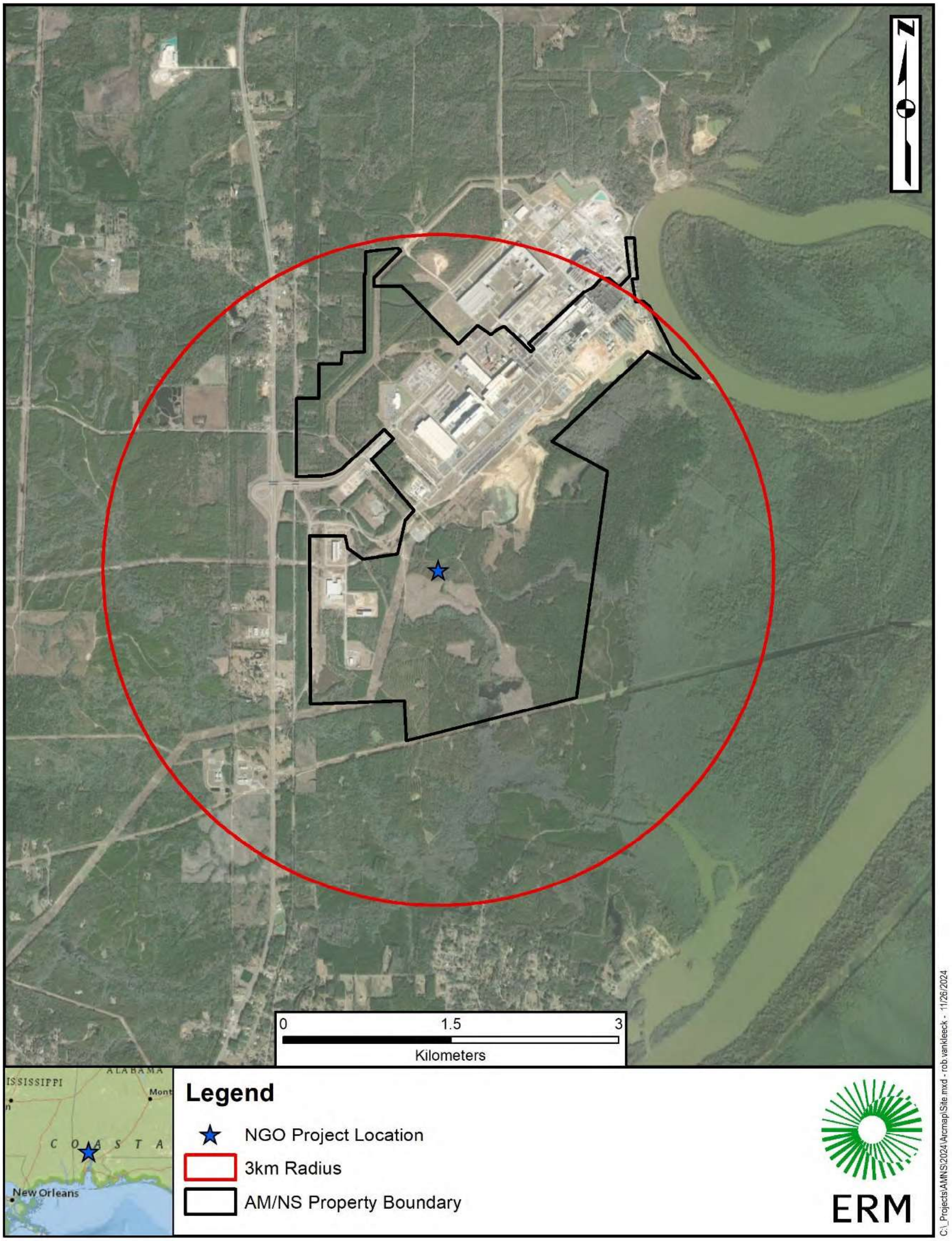


FIGURE 5-4 AERIAL DEPICTING 3-KM RADIUS AROUND THE PROJECT SITE



6. EMISSION INVENTORY DATA

ArcelorMittal Calvert

The proposed Project will have one type of source at the ArcelorMittal Calvert facility: point. The Project's preliminary stack parameters are presented in Table 6-1. For each source, the source ID in the modeling runs is listed, along with any unique characteristics related to the source. Table 6-2 summarizes air emissions of the AMC proposed project sources in grams per second (g/s), as will be used in modeling.

Other Major Emission Sources

In addition to emissions from the mill, other sources located near the mill have potential to impact concentrations in the vicinity of the mill. These sources will be incorporated in the dispersion modeling analyses if they are located within, or have a significant impact on, the proposed modification's significant impact area. ADEM will provide the nearby emission inventories for pollutants that have triggered PSD and NAAQS cumulative modeling.

If needed, permitted emissions of the existing mill's sources will be refined with the most recent 2-year (2022-2023) average emissions to account for actual operations as described in Table 8-2 of the EPA's Appendix W. [2]

2 82 Fed. Reg. 5,182 (January 17, 2017) https://www.govinfo.gov/content/pkg/FR-2017-01-17/pdf/2016-31747.pdf.

TABLE 6-1 TABLE OF STACK PARAMETERS FOR PROPOSED PROJECT SOURCES

Source ID	Source Description	Release Type	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
COOL_1	Cooling Tower 1	Vertical Point	405083.634	3444817.283	9.14	305.37	12.19	9.14
COOL_2	Cooling Tower 2	Vertical Point	405075.392	3444803.6	9.14	305.37	12.19	9.14
COOL_3	Cooling Tower 3	Vertical Point	405067.83	3444788.31	9.14	305.37	12.19	9.14
COOL_4	Cooling Tower 4	Vertical Point	405059.418	3444774.357	9.14	305.37	12.19	9.14
PICKL	Pickling Line Scrubber	Vertical Point	405062.14	3444665.85	26.82	373.15	10.00	1.20
BOIL_1	Boiler 1	Vertical Point	405157.457	3444846.68	30.00	423.15	18.00	1.25
BOIL_2	Boiler 2	Vertical Point	405152.137	3444837.251	30.00	423.15	18.00	1.25
RTO_1	Curing Oven 1 + RTO 1	Vertical Point	405213.844	3444810.929	29.82	553.15	9.60	0.76
RTO_2	Curing Oven 2 + RTO 2	Vertical Point	405237.208	3444797.153	28.91	553.15	9.60	0.76
AEAL1	Annealing Furnace	Vertical Point	405160.062	3444844.932	37.91	573.15	10.00	2.20
SPRY_R	Spray Roaster	Vertical Point	405007.061	3444671.553	45.72	338.15	5.00	0.50
SHOT_B	Shot Blaster Baghouse	Vertical Point	405100.296	3444739.022	28.91	373.15	10.00	1.30
CLEAN_1	ACL Cleaning Section 1	Vertical Point	405092.173	3444585.243	29.82	348.15	15.00	0.77
CLEAN_2	ACL Cleaning Section 2	Vertical Point	405117.138	3444571.48	28.91	348.15	15.00	0.77
CRM_1	Cold Rolling Mill 1	Vertical Point	404952.03	3444543.735	32.00	293.15	10.50	2.50
CRM_2	Cold Rolling Mill 2	Vertical Point	405014.078	3444511.011	32.00	293.15	10.50	2.50
OXIDE	Iron Oxide Bins w/ Bagfilters	Vertical Point	404995.766	3444653.387	30.48	358.15	19.69	0.36
TNK_FM	Tank Farm Scrubber	Vertical Point	404978.066	3444647.215	24.99	353.15	25.69	0.56

Source ID	Source Description	Release Type	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
ACL_C1	ACL Cooling Section 1	Vertical Point	405206.13	3444797.93	27.91	353.15	14.81	0.69
ACL_C2	ACL Cooling Section 2	Vertical Point	405230.903	3444786.778	27.91	353.15	14.81	0.69
QUEN_1	Quenching Line 1	Vertical Point	405225.36	3444834.5	27.91	329.15	14.03	2.1
QUEN_2	Quenching Line 2	Vertical Point	405251.123	3444824.078	27.91	329.15	14.03	2.1
HYPU_A1	Hydrogen Purging #1, Line 1	Vertical Point	405118.76	3444633.77	27.91	623.15	19.49	0.38
HYPU_A2	Hydrogen Purging #2, Line 1	Vertical Point	405118.76	3444633.77	27.91	623.15	19.49	0.38
HYPU_A3	Hydrogen Purging #3, Line 1	Vertical Point	405125.16	3444644.84	27.91	623.15	19.49	0.38
HYPU_A4	Hydrogen Purging #4, Line 1	Vertical Point	405214.587	3444813.424	27.91	623.15	19.49	0.38
HYPU_A5	Hydrogen Purging #5, Line 1	Vertical Point	405219.654	3444821.998	27.91	623.15	19.49	0.38
HYPU_B1	Hydrogen Purging #1, Line 2	Vertical Point	405144.152	3444624.022	27.91	623.15	19.49	0.38
HYPU_B2	Hydrogen Purging #2, Line 2	Vertical Point	405144.152	3444624.022	27.91	623.15	19.49	0.38
HYPU_B3	Hydrogen Purging #3, Line 2	Vertical Point	405148.581	3444633.127	27.91	623.15	19.49	0.38
HYPU_B4	Hydrogen Purging #4, Line 2	Vertical Point	405237.761	3444800.62	27.91	623.15	19.49	0.38
HYPU_B5	Hydrogen Purging #5, Line 2	Vertical Point	405243.429	3444811.066	27.91	623.15	19.49	0.38

TABLE 6-2 TABLE OF EMISSIONS FOR PROPOSED PROJECT SOURCES

Source ID	Source Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_x (g/s)
COOL_1	Cooling Tower 1	1.518E-03	5.103E-06	0.000E+00
COOL_2	Cooling Tower 2	1.518E-03	5.103E-06	0.000E+00
COOL_3	Cooling Tower 3	1.518E-03	5.103E-06	0.000E+00
COOL_4	Cooling Tower 4	1.518E-03	5.103E-06	0.000E+00
PICKL	Pickling Line Scrubber	2.500E-02	2.500E-02	0.000E+00
BOIL_1	Boiler 1	4.272E-02	4.272E-02	2.064E-01
BOIL_2	Boiler 2	4.272E-02	4.272E-02	2.064E-01
RTO_1	Curing Oven 1 + RTO 1	1.303E-02	1.303E-02	1.455E-01
RTO_2	Curing Oven 2 + RTO 2	1.303E-02	1.303E-02	1.455E-01
AEAL1	Annealing Furnace	8.850E-02	8.850E-02	7.670E-01
SPRY_R	Spray Roaster	1.583E-02	1.583E-02	8.889E-02
SHOT_B	Shot Blaster Baghouse	8.500E-02	8.500E-02	0.000E+00
CLEAN_1	ACL Cleaning Section 1	4.767E-02	4.767E-02	0.000E+00
CLEAN_2	ACL Cleaning Section 2	4.767E-02	4.767E-02	0.000E+00
CRM_1	Cold Rolling Mill 1	4.958E-03	4.958E-03	0.000E+00
CRM_2	Cold Rolling Mill 2	4.958E-03	4.958E-03	0.000E+00
OXIDE	Iron Oxide Bins w/ Bagfilters	5.181E-02	2.897E-02	0.000E+00
TNK_FM	Tank Farm Scrubber	1.299E-01	1.267E-01	0.000E+00
ACL_C1	ACL Cooling Section 1	4.599E-02	4.599E-02	0.000E+00
ACL_C2	ACL Cooling Section 2	4.599E-02	4.599E-02	0.000E+00
QUEN_1	Quenching Line 1	1.326E-02	4.975E-05	0.000E+00
QUEN_2	Quenching Line 2	1.326E-02	4.975E-05	0.000E+00
HYPU_A1	Hydrogen Purging #1, Line 1	0.000E+00	0.000E+00	2.930E-02
HYPU_A2	Hydrogen Purging #2, Line 1	0.000E+00	0.000E+00	4.884E-02
HYPU_A3	Hydrogen Purging #3, Line 1	0.000E+00	0.000E+00	4.884E-02
HYPU_A4	Hydrogen Purging #4, Line 1	0.000E+00	0.000E+00	4.884E-02

Source ID	Source Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_x (g/s)
HYPU_A5	Hydrogen Purging #5, Line 1	0.000E+00	0.000E+00	4.884E-02
HYPU_B1	Hydrogen Purging #1, Line 2	0.000E+00	0.000E+00	2.930E-02
HYPU_B2	Hydrogen Purging #2, Line 2	0.000E+00	0.000E+00	4.884E-02
HYPU_B3	Hydrogen Purging #3, Line 2	0.000E+00	0.000E+00	4.884E-02
HYPU_B4	Hydrogen Purging #4, Line 2	0.000E+00	0.000E+00	4.884E-02
HYPU_B5	Hydrogen Purging #5, Line 2	0.000E+00	0.000E+00	4.884E-02

7. METEOROLOGICAL DATA

Guidance for air quality modeling recommends the use of one year of onsite meteorological data or five years of representative off-site meteorological data. Since onsite data are not available for the facility, meteorological data from the National Weather Service (NWS) was used in this analysis.

AMNS proposes to utilize the latest five years (2019-2023) of pre-processed meteorological data from Mobile Regional Airport NWS station (WBAN 13894) and concurrent upper air data from the Slidell, Louisiana NWS station (WBAN 53813) as the source of representative meteorological data in the air quality modeling analysis. These stations correspond to the representative NWS data for Mobile and Washington counties in Appendix B of ADEM's May 2024 PSD Air Quality Analysis Modeling Guidelines. The airport is located about 55 kilometers southwest of the facility. The pre-processed, hourly NWS data, including the low wind speed option (Adjusted U*), was obtained from the ADEM Air Division, which was processed by ADEM with the latest AERMET version 24142. Figure 7-1 presents the cumulative annual frequency wind rose.

ADEM Air Division processed meteorological data using AERMET includes key components listed in the "Mobile Readme" word document. Specifically, ADEM used the EPA recommended method to determine the applicable Bowen Ratio moisture tables for each year, which corresponds to dry in 2020 and 2023, average in 2019 and 2022, and wet in 2021. AERSURFACE surface characteristics assigned by ADEM are outlined below:

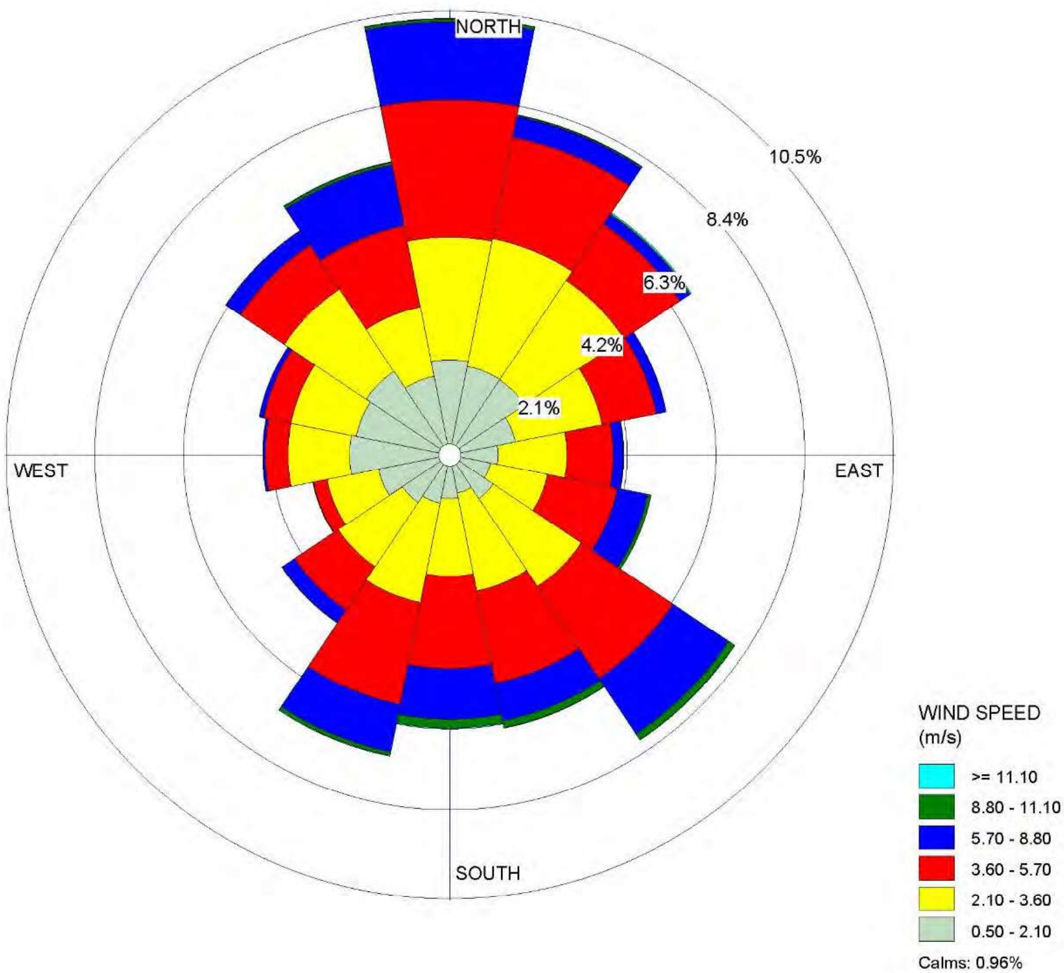
- Late autumn after frost and harvest, or winter with no snow – December, January, February.
- Transitional spring – March, April, May
- Midsummer with lush vegetation – June, July, August, September
- Autumn with unharvested cropland – October, November

AERMINUTE (version 15272) was used to generate hourly averaged wind speeds and wind directions to supplement the standard hourly ASOS observations. The hourly averaged wind speed and direction generated by the AERMINUTE program was merged with data from standard surface archives, along with upper air in Stage 2 of AERMET processing. THRESH_1MIN keyword was used in Stage 2 to specify a 0.5 m/s threshold wind speed for the 1-minute data. This threshold value only applies to the hourly averaged winds derived from 1-minute data and does not apply to the standard hourly NWS weather observations.

FIGURE 7-1 5 YEAR (2019-2023) WIND ROSE FOR MOBILE AIRPORT, AL

WIND ROSE PLOT:
5-Year Wind Rose for Mobile Airport 2019 - 2023

DISPLAY:
Wind Speed Direction (blowing from)



COMMENTS:

DATA PERIOD:
Start Date: 1/1/2019 - 00:00
End Date: 12/31/2023 - 23:59

COMPANY NAME:

MODELER:
Robert Van Kleeck

CALM WINDS:
0.96%

TOTAL COUNT:
43515 hrs.

AVG. WIND SPEED:
3.40 m/s

DATE:
7/12/2024

PROJECT NO.:

8. RECEPTOR GRID AND RESTRICTED ACCESS

The initial significant impact analyses will be performed using a receptor extending out to 20 km (consisting of 13,202 receptors). The receptor assignments are as follows:

1. 100-meter (m) spacing along the mill fence line;
2. 100-m spacing fence line to 5,000 m;
3. 250-m spacing from 5,000 m to 7,000 m;
4. 500-m spacing from 7,000 m to 10,000 m; and
5. 1,000-m spacing from 10,000 m to 20,000 m.

Figures 8-1 and 8-2 show the near-field and the far-field for the 20 km receptor grid. Receptor elevations were assigned using the USEPA's AERMAP software tool (version 24142), which is designed to extract elevations from USGS National Elevation Dataset (NED) data at 1/3 arc-second (approximately 10 m) resolution in GeoTIFF format. AERMAP, the terrain preprocessor for AERMOD, uses interpolation procedures to assign elevations to a receptor. Base elevations for mill buildings and emission sources are based on information provided by ArcelorMittal Calvert. For any cases in which high gradients of concentrations occur within a nearby inventory facility's fence line, AMC will split the receptor grid to exclude the emission impacts from the culpable inventory facility from within their own fence line. As per ADEM guidance, for the cumulative modeling runs, all maximum impacts will be resolved within a 100 meter receptor spacing with receptors added if the predicted maxima occurs beyond 5 km. For SIL modeling, Table 4-2 summary and Appendix A figures demonstrates that all applicable pollutants and averaging periods maximum impacts occur within the 100 meter receptor spacing at the facility's fence line. Additionally, all applicable pollutants and averaging periods ground level concentrations are decreasing towards the edge of the modeling domain.

In accordance with the U.S. EPA guidance *Revised Policy on Exclusions from "Ambient Air"*, video surveillance, monitoring, routine security patrols and clear signage may adequately preclude public access.[3] AMC respectfully requests consideration of this provision given the facility layout and shared infrastructure with its neighbor, Outokumpu Stainless USA, LLC (Outokumpu). The following procedures describe the security protocols for AM/NS, which AMC resides within. AMC will rely on the Security Services of AM/NS.

AM/NS, is situated on approximately 2,000 acres and is bordered to the south by timberland, wetlands, and a natural gas utility corridor. The facility is bordered to the east by the Tombigbee River and to the west by the Norfolk Southern rail mainline. AM/NS shares a property boundary to the north with neighboring facility, Outokumpu, and shares infrastructure such as utilities, river terminal facilities and AM/NS processes slabs for Outokumpu. Outokumpu manages security separately from AM/NS through a security access point from the north of their property (Paul Bayou Road). For AM/NS, security is managed by the Fire Department which also provides first response services to Outokumpu and therefore must be able to quickly traverse between the common property boundary unimpeded. Since there are several shared utilities and infrastructure

3 U.S. Environmental Protection Agency, *Revised Policy on Exclusions from "Ambient Air"* December, 2019

as well as the placement of buildings and roads, a fence line along the northern boundary between the two facilities is not practical. To assist with security, signage depicting the property boundary demarcation including the wording "authorized personnel only" are located at each road crossing of the common property boundary.

The AM/NS Fire/Security Department provides continuous video monitoring (noted by the green video camera icon in Figure 8-3) and has posted clearly visible signage (Authorized Personnel Only). These security measures are employed along all interior perimeter areas in which the two companies have shared areas of travel. Authorized Outokumpu traffic allowed on the AM/NS site includes semi-trucks that pass through the radiation portal and/or weight scales located near the AM/NS Dispatch Building which is highlighted in blue in Figure 8-3.

The River Terminal common area for AM/NS and Outokumpu includes a road that connects to the site via 26th Street which is highlighted in green in Figure 8-3. AM/NS employees, Outokumpu employees, and contractors are permitted in this area. This common area is continuously monitored/recorded by AM/NS Fire/Security Department personnel.
The AM/NS Fire/Security Department:

- Conducts four patrols daily of the interior perimeter of the AM/NS site.
- Conducts an exterior perimeter patrol once a week to ensure security of the facility and inspect. all fencing and clearly visible Authorized Personnel Only signage.
- Conducts fire suppression inspections daily on both the AM/NS and Outokumpu sites.
- Provides Emergency Services for AM/NS and Outokumpu.

In accordance with the U.S. EPA guidance on the Revised Policy on Exclusions from "Ambient Air,"[3] AM/NS Calvert employs a combination of physical fencing, video surveillance, monitoring, routine security patrols, and clear signage to effectively restrict public access. Figure 8-4 illustrates the property boundary and highlights the various means of access control, excluding video surveillance.

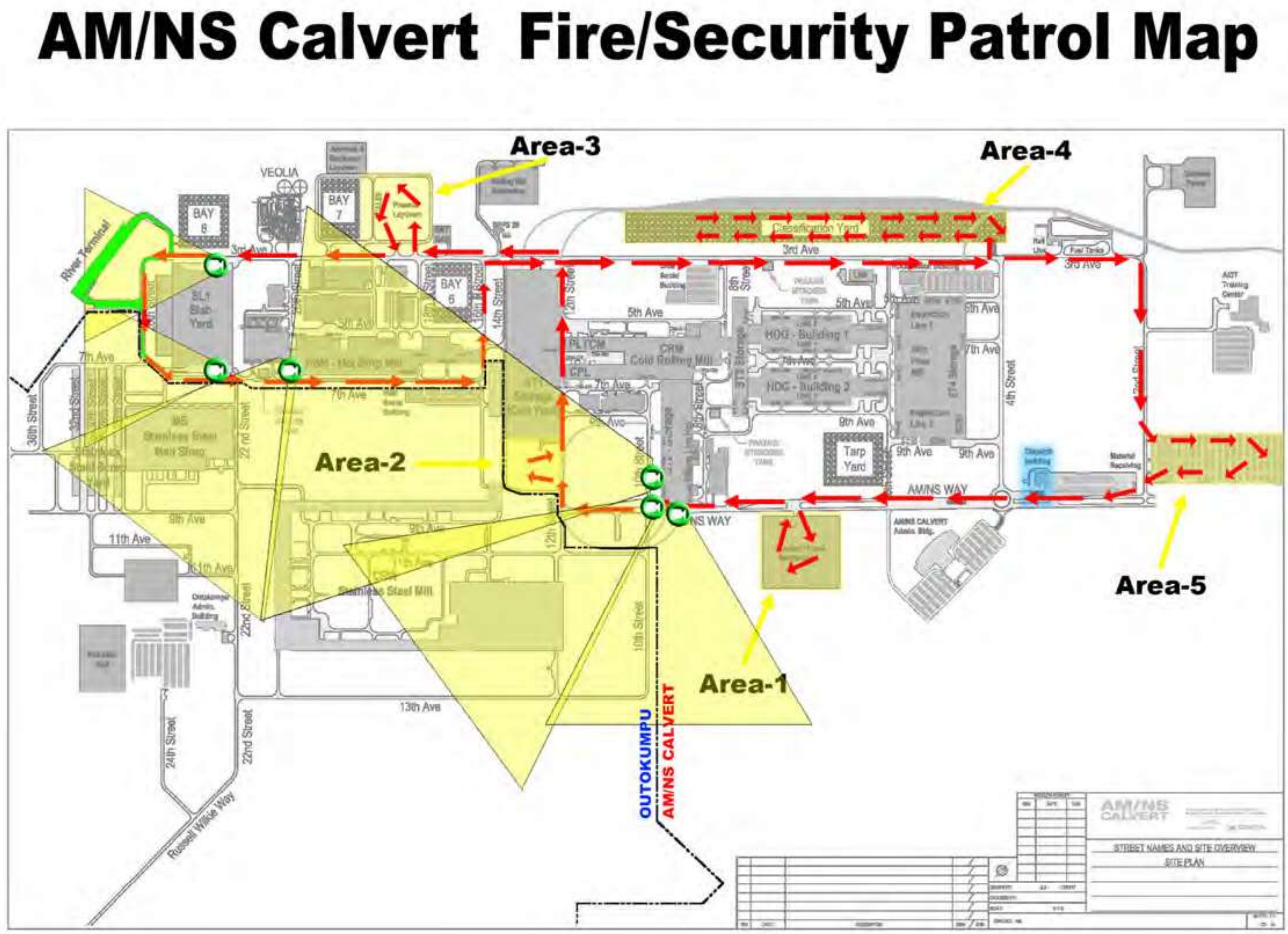
The facility was originally built by ThyssenKrupp and included both carbon and stainless-steel operations. The stainless-steel business was later divested to Outokumpu, and AM/NS subsequently acquired the carbon steel assets. As the two companies share the site, AM/NS Calvert has posted signage clearly marking its property and restricting access to authorized personnel only. This area is depicted by a blue line, starting at the Tombigbee River, and extending southwest, where it connects to the physical fence at the entrance to Outokumpu's security gate. The perimeters marked in red indicate locations where AM/NS Calvert uses physical fencing to prevent public access. The Tombigbee River itself serves as a natural barrier to public access, with two marine docks where operational activities occur around the clock, 365 days a year. Additionally, the riverbanks are steep and tall, creating an additional natural deterrent along the undeveloped areas adjacent to the river. The area highlighted in green represents zones where a combination of signage and natural barriers, such as wetlands, effectively restricts public access along the property boundary.

AM/NS Calvert's Second Street, highlighted in yellow, is a privately owned road that provides access to the Alabama Industrial Development Training (AIDT) Building and AM/NS Calvert’s Industrial Park. Unlike other areas of the facility, entry through a guard gate is not required. However, the street and surrounding properties are clearly posted with signage prohibiting public access, and the area is monitored by security cameras and regular patrols. Plans are underway to enhance security along Second Street by installing additional controlled access points, which will be completed prior to the start-up of the NGOES mill.

FIGURE 8-1 FAR FIELD AERMOD RECEPTOR GRID

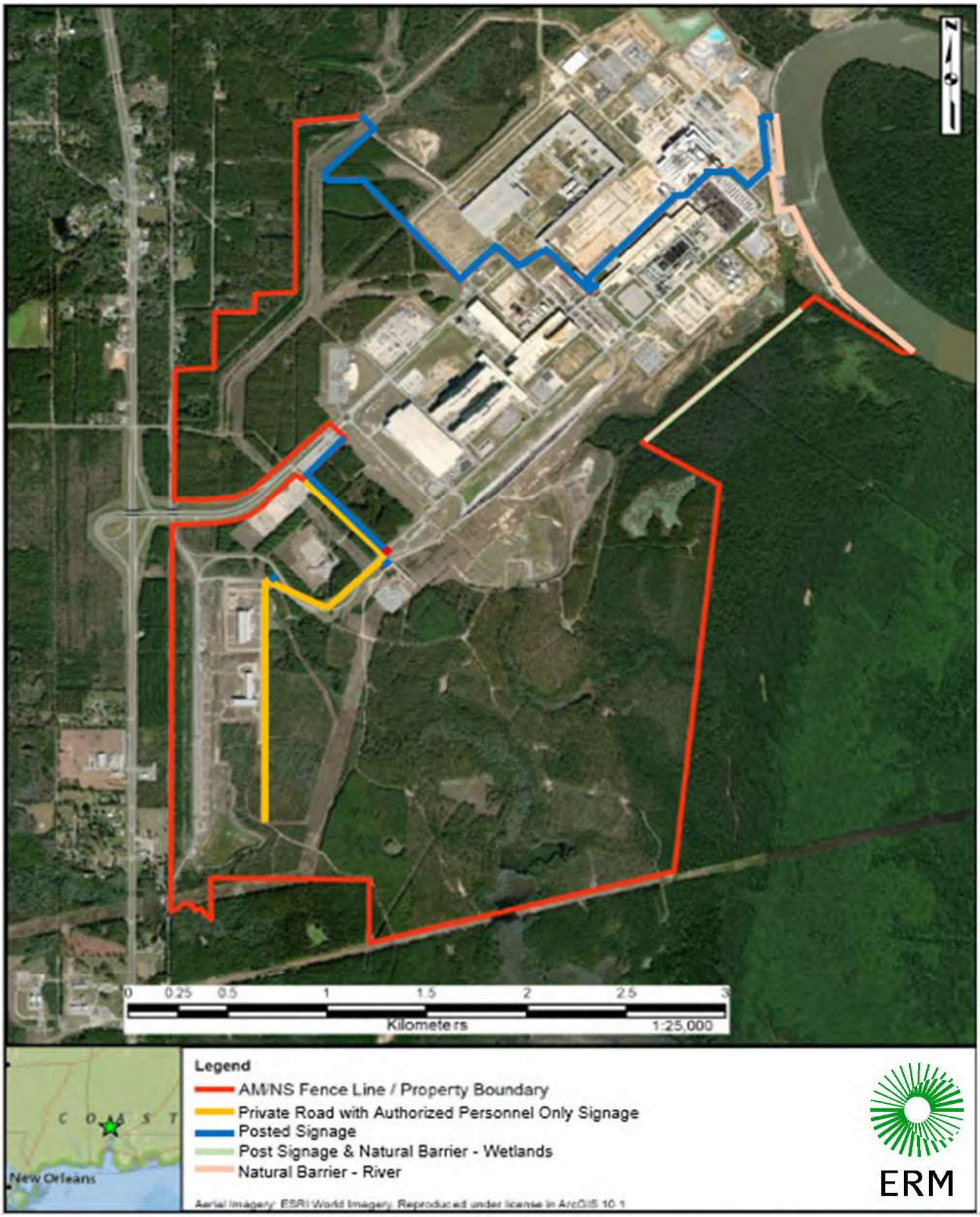
FIGURE 8-2 NEAR-FIELD AERMOD RECEPTOR GRID

FIGURE 8-3 AM/NS PATROL MAP



Note: North is towards the lower left corner

FIGURE 8-4 AM/NS CALVERT RESTRICTED ACCESS BOUNDARY



9. AMBIENT BACKGROUND CONCENTRATIONS

Representative background concentrations will be added to the maximum predicted concentrations due to major emission sources for comparison with the national ambient air quality standards. The proposed background concentrations have been provided by ADEM [4] and are listed in Table 9-1.

TABLE 9-1 MONITORED DESIGN VALUES

Pollutant	Monitoring Station	Averaging Period	Monitored Design Value ($\mu g/m^3$)	Years
NO_2	Yorkville, GA	1-hr	31	2013-2015
NO_2	Yorkville, GA	Annual	7.5	2013-2015
PM_{10}	Montgomery	24-hr	24	2021-2023
$PM_{2.5}$	Sumter	24-hr	16	2021-2023
$PM_{2.5}$	Sumter	Annual	6.2	2021-2023

4 Correspondence between ERM (Jared Williams) and ADEM (Jackson Rogers), May 17, 2024.

10. AMBIENT AIR QUALITY IMPACT ANALYSIS

The ambient air quality impact from the proposed modification and existing emission sources will be assessed by performing the following dispersion modeling analyses:

- Determine whether the proposed modification has a significant air quality impact for each pollutant subject to PSD review;
- Demonstrate compliance with the PSD increments; and
- Demonstrate compliance with the NAAQS.

These analyses will be performed using the 5-year meteorological database for 2019-2023 for the Mobile Regional Airport as described in Section 7.

10.1 NO_X TO NO_2 CONVERSION

For NO_2 modeling, AMC proposes to use the regulatory default Tier 2 Ambient Ratio Method 2 (ARM2) option with the default minimum and maximum NO_2/NO_X ratios of 0.5 and 0.9 to calculate conversion of NO_X to NO_2.

10.2 DETERMINATION OF SIGNIFICANT IMPACT AREAS

The significant impact area (SIA) is defined as the area in which predicted concentrations, due to the proposed modification, exceed specified significant impact levels (SILs, refer to Table 4-1) on a pollutant-specific basis. Table 4-2 summarizes the SIL results and shows that they are resolved on the 100-meter spacing receptor grid. Appendix A presents contour plots and SIAs.

10.3 SIGNIFICANT MONITORING CONCENTRATIONS

The maximum concentrations from the Project were compared against the applicable monitoring *de minimis* concentration or SMC, as shown in Table 4-2. The indicate that annual NO_2 and 24-hour PM_{10} are less their respective SMCs.

A preconstruction ambient air monitoring waiver must be requested in order for a facility subject to PSD review to be exempt from preconstruction ambient air monitoring requirements. A waiver may be considered based on the modeled impacts of the Project when compared to the SMCs in 40 CFR 52.21. If a project cannot be exempted from preconstruction monitoring based on modeling results, the applicant may propose the use of existing monitoring data if appropriate justification is provided. As presented in Table 9-1, ADEM has provided representative regional background data from nearby monitoring sites for all applicable pollutants.

10.4 COMPLIANCE WITH AMBIENT AIR QUALITY STANDARDS

An inventory of other major sources within and, varying distances dictated by guidance, beyond the SIA of the mill for each pollutant and averaging period was requested from and provided by ADEM for use in the cumulative NAAQS and PSD Increment modeling.

These ADEM-provided nearby inventory sources, along with non-Project AMC facility sources, will be included in the compliance demonstrations for any triggered cumulative modeling. Concentrations from the MERPs analysis of the Project will be included to the modeled $PM_{2.5}$

concentrations. ADEM will provide concentrations from the MERPs analysis of the offsite nearby facilities. The maximum predicted concentrations from the dispersion modeling analyses will be added to the representative background concentrations to attain the design concentration. The design concentration will then be compared with NAAQS. In the event that a violation of an applicable air quality standard is discovered, a "cause-or-contribute" analysis will be conducted to determine whether the Project causes or contributes to a modeled exceedance at the same receptor and averaging period.

10.5 PREVENTION OF SIGNIFICANT DETERIORATION CLASS II INCREMENT ASSESSMENT

The USEPA has promulgated regulations that establish PSD air quality increments for PM_{10}, $PM_{2.5}$ and NO_2. The proposed modification is subject to PSD review for the aforementioned PSD air quality increments. An emission inventory of other PSD increment consuming and expanding sources located within the SIA of the mill for NO_2, PM_{10}, and $PM_{2.5}$ has been requested from ADEM. As applicable, the AMC steel mill will be modeled in combination with other major PSD increment-consuming sources (with credits given for PSD Increment expanding sources) in the area to demonstrate compliance with the respective PSD increments. Concentrations from the MERPs analysis of the Project sources will be included to the modeled $PM_{2.5}$ concentrations. ADEM will provide concentrations from the MERPs analysis of the offsite nearby facilities.

10.6 SECONDARY FORMATION OF $PM_{2.5}$

For estimating the Project impacts on secondary $PM_{2.5}$, AMC completed a Modeled Emission Rates for Precursors (MERPs) analysis. Secondary $PM_{2.5}$ precursors are emissions of NO_X and SO_2.

AMC will utilize the U.S. EPA's MERPs as a first-tier assessment of impacts on secondary $PM_{2.5}$ formation and following the latest guidance from April 30, 2024[5]. EPA provides a MERPs View Qlik Tool[6] for identifying a representative hypothetical source and using the hypothetical source modeled impacts on $PM_{2.5}$ to estimate Project secondary $PM_{2.5}$ impacts. Table 10-1 shows the MERPs for the most representative hypothetical source (e.g., 500 tpy and 10 meters stack) located nearest to the AMC facility. The Autauga, Alabama hypothetical source is approximately 200 km north of the AMC facility, both sites are in a relatively flat terrain. The Project elevation is about 14 meters in comparison to the Autauga site at 96 meters. Appendix B provides additional justification for the hypothetical source selection. The results of the MERPs View Qlik Tool are summarized in Table 10-1.

5 U.S. EPA. Supplement to the Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program. April 30, 2024. Available at: https://www.epa.gov/system/files/documents/2024-04/supplement-to-the-guidance-on-significant-impact-levels-for-ozone-and-fine-particles-in-the-psd-permitting-program-4-30-2024.pdf

6 United States Environmental Protection Agency. 2024. MERPs View Qlik Tool. Available at: https://www.epa.gov/scram/merps-view-qlik

TABLE 10-1 EPA MERPS VIEW QLIK OUTPUT

State	County	Metric	Precursor	Emissions (TPY)	Stack (m)	EPA Max Conc
Alabama	Autauga	8-hr Ozone	NOx	500	10	2.012 ppb
Alabama	Autauga	8-hr Ozone	VOC	500	10	0.064 ppb
Alabama	Autauga	Annual PM2.5	NOx	500	10	0.010 μg/m^3
Alabama	Autauga	Annual PM2.5	SO2	500	10	0.029 μg/m^3
Alabama	Autauga	Daily PM2.5	NOx	500	10	0.178 μg/m^3
Alabama	Autauga	Daily PM2.5	SO2	500	10	1.231 μg/m^3

The secondary formation of $PM_{2.5}$ as a result of pre-cursor emissions of NOx (65.20 tpy) and SO_2 (0.58 tpy) Project emissions was computed using Equation 1 from the 2024 guidance[5] and hypothetical source data from Table 10-1.

Equation 1:

Project Air Quality Impact = Project emissions * (modeled air quality impact from hypothetical source / modeled emissions rate from hypothetical source)

24-hour $PM_{2.5}$ Secondary Project Air Quality Impact

NO_x Project Air Quality Impact = 65.20 tpy * (0.178 μg/m^3 / 500 tpy) = 0.0232 μg/m^3

SO_2 Project Air Quality Impact = 0.58 tpy * (1.231 μg/m^3 / 500 tpy) = 0.0014 μg/m^3

Total Secondary (NO_X & SO_2) 24-hour Project Air Quality Impact =

0.0232 μg/m^3 + 0.0014 μg/m^3 = 0.025 μg/m^3

The calculated amount of **0.025 μg/m^3** will be then added to the primary $PM_{2.5}$ modeled concentration at the SIL, NAAQS, and PSD level before comparing to applicable thresholds to account for the contribution of 24-hour secondary $PM_{2.5}$.

Annual $PM_{2.5}$ Secondary Project Air Quality Impact

NO_x Project Air Quality Impact = 65.20 tpy * (0.010 μg/m^3 / 500 tpy) = 0.001 μg/m^3

SO_2 Project Air Quality Impact = 0.58 tpy * (0.029 μg/m^3 / 500 tpy) = 0.00003 μg/m^3

Total Secondary (NO_X & SO_2) Annual Project Air Quality Impact =

0.001 μg/m^3 + 0.00003 μg/m^3 = 0.001 μg/m^3

The calculated amount of **0.001 μg/m^3** will be then added to the primary annual $PM_{2.5}$ modeled concentration at the SIL, NAAQS, and PSD level before comparing to applicable thresholds to account for the contribution of annual secondary $PM_{2.5}$. For the cumulative modeling, ADEM will provide the secondary $PM_{2.5}$ from the offsite sources to the added to the total concentrations.

10.7 OZONE AMBIENT IMPACT ANALYSIS

For estimating the Project impacts on ozone formation, AMC completed a Modeled Emission Rates for Precursors (MERPs) analysis. Ozone precursors are emissions of VOC and NO_X.

AMC will utilize the U.S. EPA's MERPs as a first-tier assessment of impacts on ozone formation. EPA provides a MERPs tool[7] for identifying a representative hypothetical source and using the hypothetical source modeled impacts on ozone and $PM_{2.5}$ to estimate Project impacts on ozone and $PM_{2.5}$. Table 10-1 shows the MERPs for the most representative hypothetical source located nearest to the AMC facility. The Autauga, Alabama hypothetical source (e.g., 500 tpy and 10 meters stack) is approximately 200 km north of the AMC facility, both in a flat terrain. Appendix B provides additional justification for the hypothetical source selection.

Ozone concentration as a result of pre-cursor emissions of NOx (65.20 tpy) and VOC (63.31 tpy) Project emissions was computed using Equation 1 from the 2024 guidance[5] and hypothetical source data from Table 10-2.

8-hour Ozone Secondary Project Air Quality Impact

NO_x Project Air Quality Impact = 65.20 tpy * (2.01 ppb / 500 tpy) = 0.262 ppb

VOC Project Air Quality Impact = 63.31 tpy * (0.064 ppb / 500 tpy) = 0.008 ppb

Total Secondary (NO_X & VOC) Project Air Quality Impact =

0.262 ppb + 0.008 ppb = 0.27 ppb

The Project's preliminary ozone impacts are estimated to be **0.27 ppb**, which is less than the ozone SIL of 1 ppb. Table 10-2 shows the Project's ozone impacts added to a background monitor ozone value. The nearest active monitor with three recent years of complete data is the Chickasaw monitor (ID: 01-097-0003). Because of its proximity to the plant site, this monitor provides the best representative ozone data for the area of the AMC facility, as documented in Appendix B.

As shown in the table, the total ozone impact including the background ozone value is less than the NAAQS; therefore, this preliminary analysis shows that the Project is expected to demonstrate compliance with the ozone NAAQS in all areas.

7 United States Environmental Protection Agency. 2024. MERPs View Qlik Tool. Available at: https://www.epa.gov/scram/merps-view-qlik

TABLE 10-2 PROJECT OZONE IMPACTS AND BACKGROUND OZONE VALUE COMPARED TO NAAQS

Chickasaw Background Ozone Value (2021-2023) (ppb)	Project Ozone Impact (ppb)	Total Ozone Impact (ppb)	8-hour Ozone NAAQS (ppb)	Exceeds NAAQS?
60.00	0.27	60.27	70	No

10.8 ADDITIONAL AIR QUALITY IMPACT ANALYSES

A qualitative assessment of the impacts on general growth, soil, and vegetation associated with the proposed modification will be performed. Since the national secondary ambient air quality standards specify the levels of pollutant concentrations to protect public welfare (soil, vegetation, etc.) from any known or anticipated adverse effects of air pollutants, the impact analysis will be based primarily on whether the national secondary ambient air quality standards would be exceeded.

The visibility is not expected to be impacted by the project.

11. IMPACT ON PSD CLASS I AREAS

The nearest PSD Class I area is the Breton Wildlife Refuge, located approximately 147 km south-southwest of the mill, as shown in Figure 11-1. Because the Class I area is greater than 100 km from AMC, ADEM does not require AMC to address the modification's impact on PSD Increment at the Class I Area. The Federal Land Managers (FLM) use the following approach to determine whether a PSD Project should provide detailed dispersion modeling impact analyses for air quality related values (AQRVs):

$$[SO_2 + NO_x + PM_{10} \text{ emissions (tpy)}]/ \text{ distance (km)} > 10$$

Using the maximum 24-hr emissions increases associated with the modification, we evaluated the above equation and the corresponding results are (0.58 tpy of SO_2 + 65.20 tpy of NO_x + 25.68 tpy of PM_{10})/147 km = 0.6. Because this factor is well below the screening level of 10, AQRV analyses for the Class will not be required. The Federal Land Manager of the Class I area have been notified with the "Request for Applicability of Class I Area Modeling Analysis, Southern Region, U.S. Forest Service" form, as shown in Figure 11-2. Jaron Ming of FWS has confirmed on September, 19, 2024 that based on the provided information in the form, Class I modeling will not be required, as shown in the correspondence on page 41.

Both FLM and ADEM will be provided with any details relevant to Class I impacts from the proposed modification.

FIGURE 11-1 CLASS I AREA LOCATION RELATIVE TO THE PROJECT

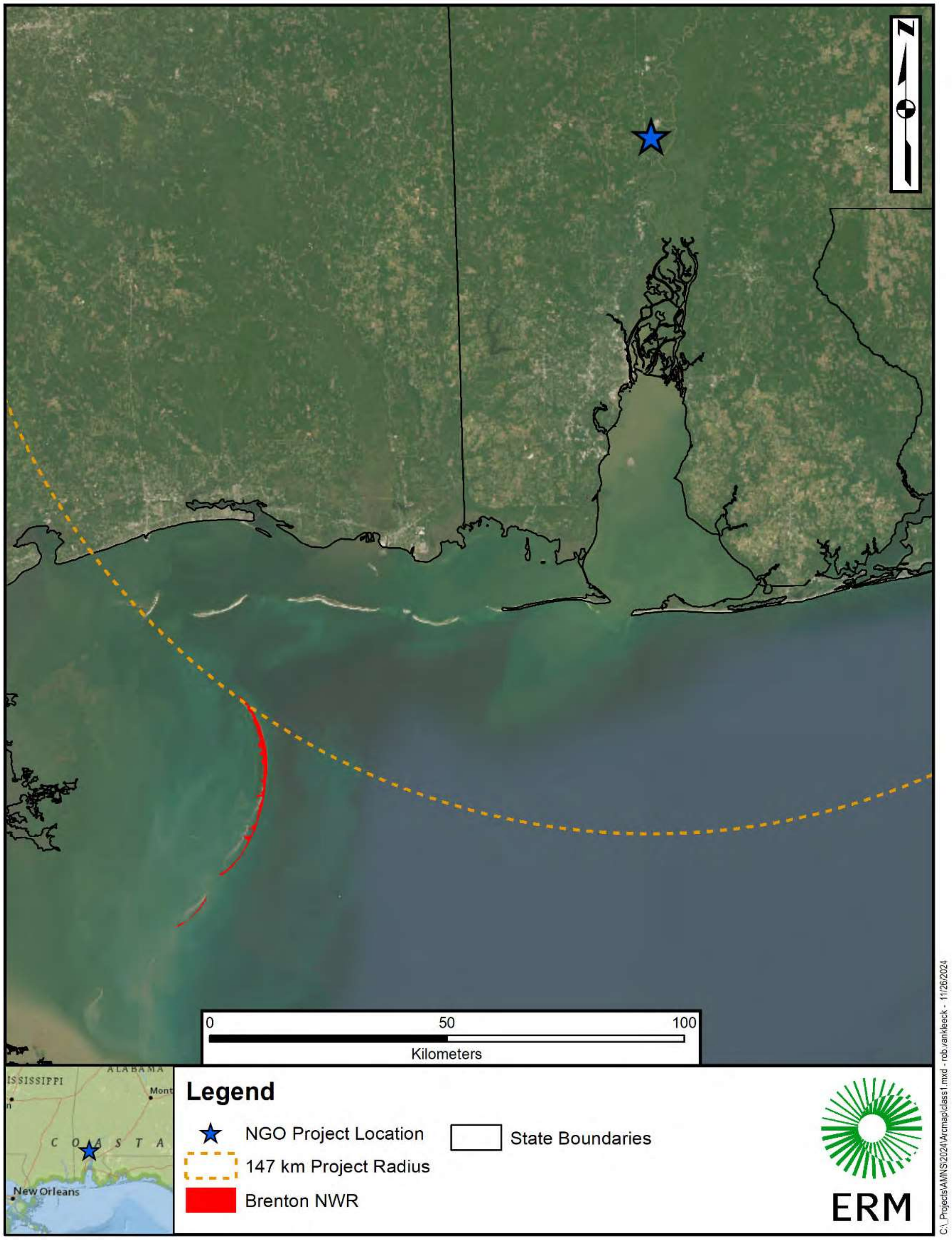


FIGURE 11-2 CLASS I AREA FORM TO US FOREST SERVICE

Request for Applicability of Class I Area Modeling Analysis
Southern Region, U.S. Forest Service

Facility Name (Company Name)	ArcelorMittal Calvert
New Facility or Modification?	Modification
Source Type	Carbon Steel Mill
Project Location (County/State/ Lat. & Long. in decimal degrees)	Calvert, Alabama lat=31.145279°, long= -87.991202°

Application Contacts

Applicant		*Consultant*		*Air Agency Permit Engineer*	
Company	ArcelorMittal Calvert	**Company**	ERM	**Agency**	ADEM
Contact	Jacqueline Gorski	**Contact**	Joe Gross	**Contact**	Jackson Rogers P.E.
Address	AM/NS Calvert, LLC P.O. Box 456 Calvert, AL 36513	**Address**	3838 N. Causeway Blvd. Suite 3000 Metairie, LA 70002	**Address**	1400 Coliseum Blvd. Montgomery, AL 36110-2400
Phone #	251-289-3395	**Phone #**	504-617-0184	**Phone #**	334-271-7784
Email	jacqueline.gorski@arcelormittal.com	**Email**	joe.gross@erm.com	**Email**	jackson.rogers@adem.alabama.gov

Briefly Describe the Proposed Project

Construction of annealing, pickling and coating operations to support the development of electrical steel.

Proposed Emissions and BACT

Criteria Pollutant	*Proposed Emissions (tons/year)*	*Emission Factor (AP-42, Stack Test, etc?)*	*Proposed BACT*
Nitrogen Oxides	49.59	AP-42, Vendor Data	SCR, Low NOx Burners, Good Combustion Practices
Sulfur Dioxide	0.58	AP-42	N/A, Project is not triggering PSD for SO2. Good Combustion Practices, and the use of low sulfur fuels (i.e. natural gas) will be used.
Particulate Matter (filterable+condensable)	25.75	AP-42, Vendor Data	Baghouse, Wet Scrubber, Mist Eliminator, Good Combustion Practices, Drift Eliminators
Volatile Organic Compounds	42.21	AP-42, Vendor Data	Regenerative Thermal Oxidizer, Good Combustion Practices

Proximity to U.S. Forest Service Class I Areas

Class I Area	Breton		
Distance from Facility (km)	130		
Calculated Q/d (from above)	0.6		

For Additional Information or Questions, Contact Melanie Pitrolo
(828) 257-4213 or mpitrolo@fs.fed.us

Correspondence and approval letter from FWS.

From:	Ming, Jaron E
To:	Joe Gross; Allen, Tim; Collins, Catherine; ap_nepa@fws.gov
Cc:	Owen, Jim; Roebling, Dallas D; Zachary Zamora; Vikram Kashyap; Olga Samani; Gorski, Jacqueline; Ralph Lopez
Subject:	Re: [EXTERNAL] Request for Applicability of Class I AQRV
Date:	Thursday, September 19, 2024 10:26:35 AM
Attachments:	image001.png

You don't often get email from jaron_ming@fws.gov. Learn why this is important

EXTERNAL MESSAGE

Thank you for the information. FWS will not request additional information or analysis for this project at this time. However, please let us know if there are any changes to the proposed activities or other circumstances. Thanks!

From: Joe Gross <Joe.Gross@erm.com>
Sent: Thursday, September 19, 2024 7:49 AM
To: Allen, Tim <tim_allen@fws.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Ming, Jaron E <jaron_ming@fws.gov>; ap_nepa@fws.gov <ap_nepa@fws.gov>
Cc: Owen, Jim <JO@adem.alabama.gov>; Roebling, Dallas D <dallas.roebling@adem.alabama.gov>; Zachary Zamora <Zachary.Zamora@erm.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>; Olga Samani <Olga.Samani@erm.com>; Gorski, Jacqueline <jacqueline.gorski@arcelormittal.com>; Ralph Lopez <rlopez3@tormod.com>
Subject: [EXTERNAL] Request for Applicability of Class I AQRV

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good Morning All,

The ArcelorMittal Calvert facility in Mobile, Alabama is working on a new project for the development of electrical steel.

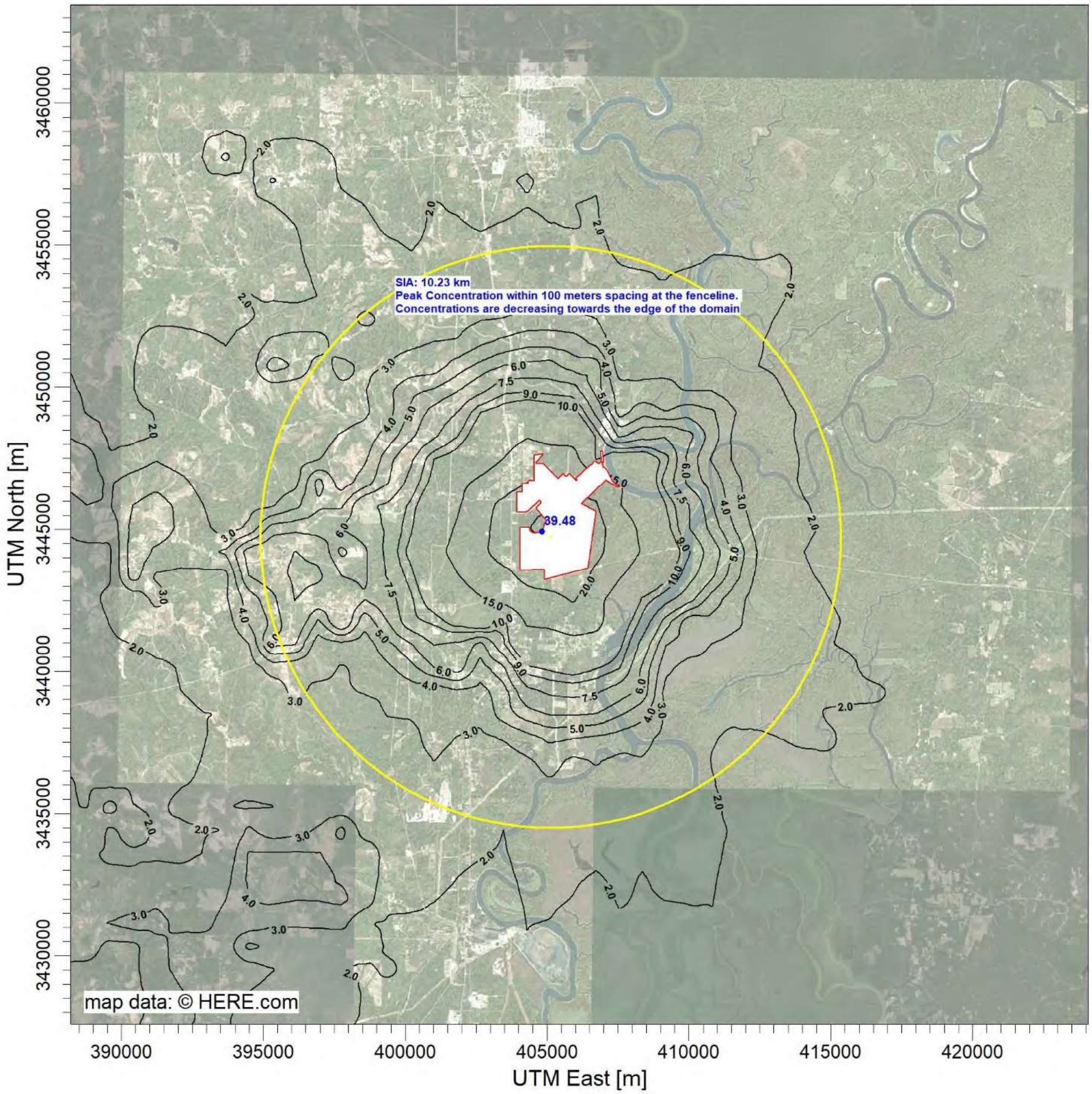
Attached is the applicability request/determination for an AQRV for the project.

Based on the magnitude of estimated emissions from the project, the distance to Breton, and the fact that the Q/d is extremely low (less than 1), we were hoping to get a non-applicability determination.

Please let us know if you have any questions or would like to discuss.

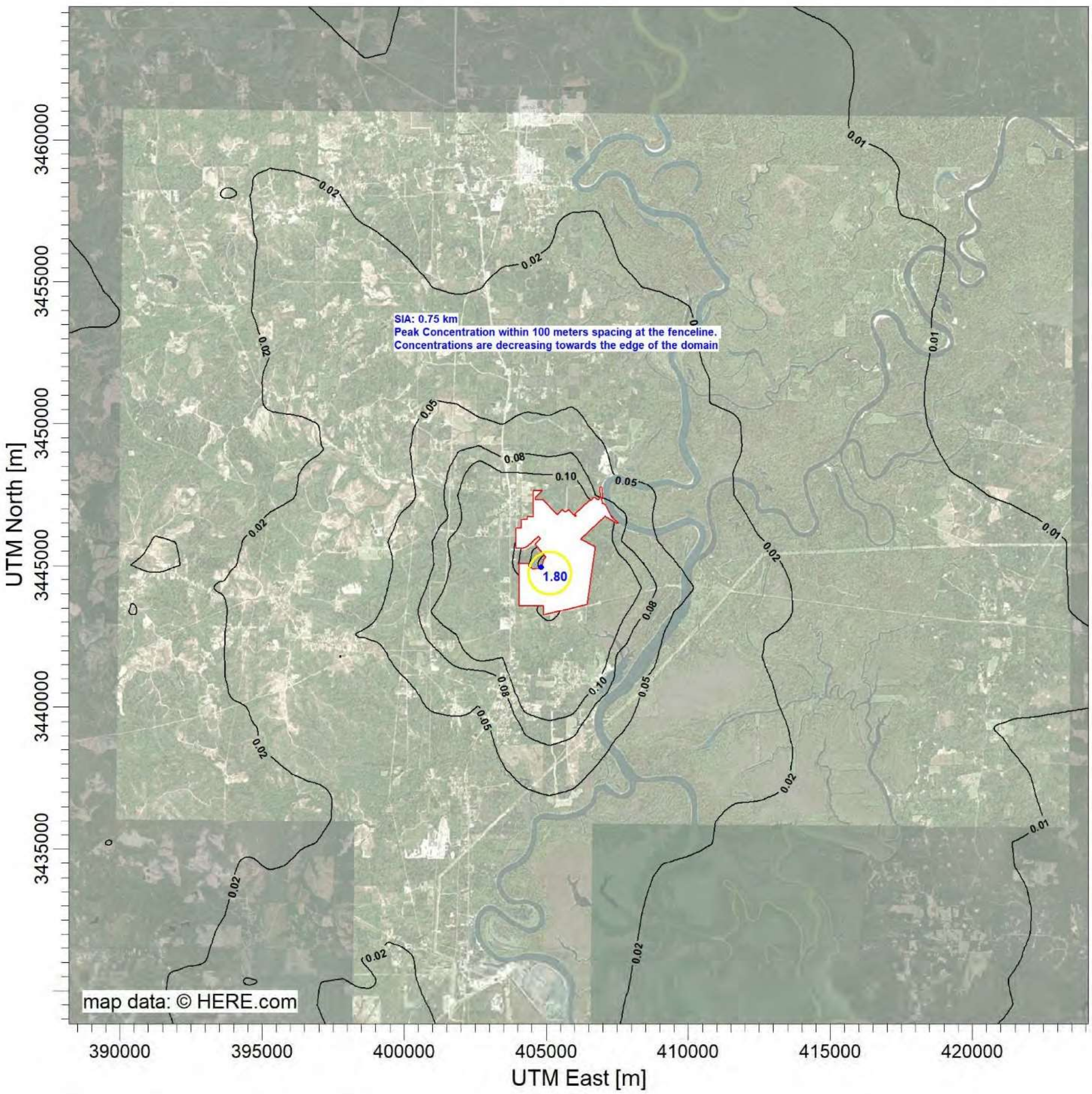
APPENDIX A: SIL MODELING RESULTS FIGURES

FIGURE A-1 NO_2 1-HOUR SIL MODELING RESULTS CONTOUR PLOT AND SIA



COMMENTS:	SOURCES:		
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	32		
	RECEPTORS: 13433		
	OUTPUT TYPE: Concentration	SCALE: 1:225,346 0 — 5 km	
	MAX: 39.5 ug/m^3	DATE: 12/10/2024	PROJECT NO.:

FIGURE A-2 NO_2 ANNUAL SIL MODELING RESULTS CONTOUR PLOT AND SIA



COMMENTS: Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	SOURCES: **32** RECEPTORS: **13433**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:225,347 0 ——— 5 km	
	MAX: **1.80 ug/m^3**	DATE: **12/10/2024**	PROJECT NO.:

FIGURE A-3 $PM_{2.5}$ 24-HOUR SIL MODELING RESULTS CONTOUR PLOT AND SIA

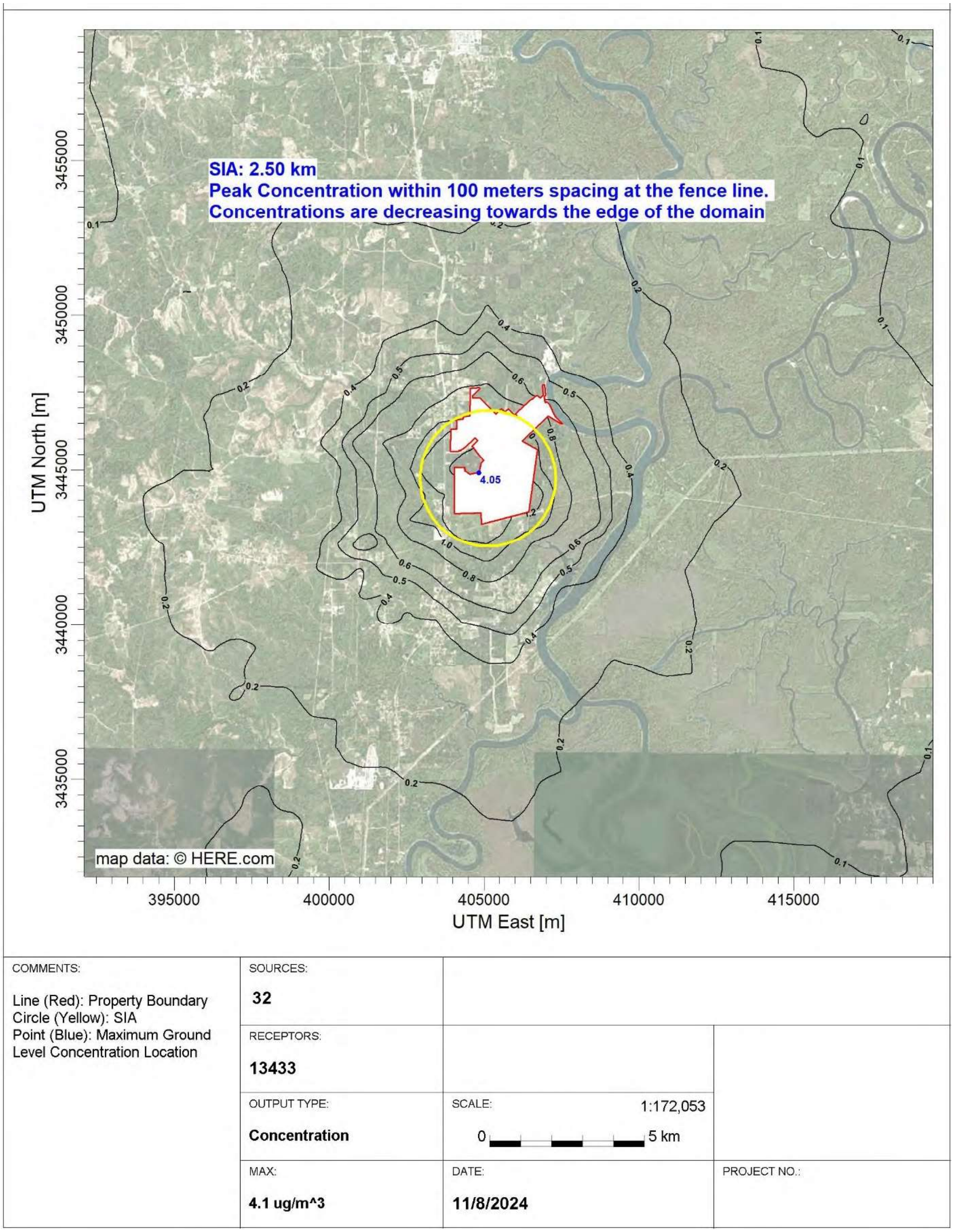
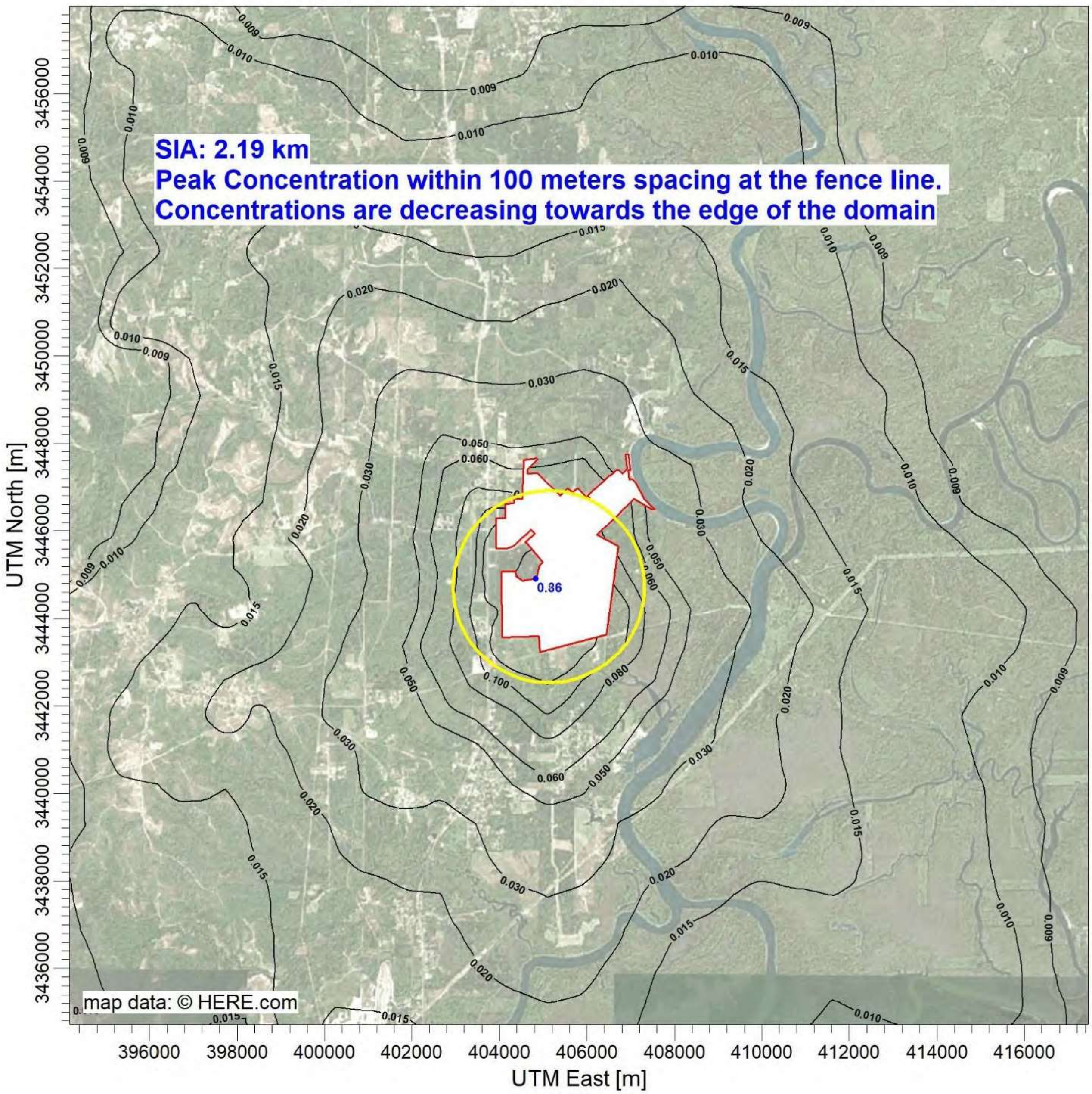
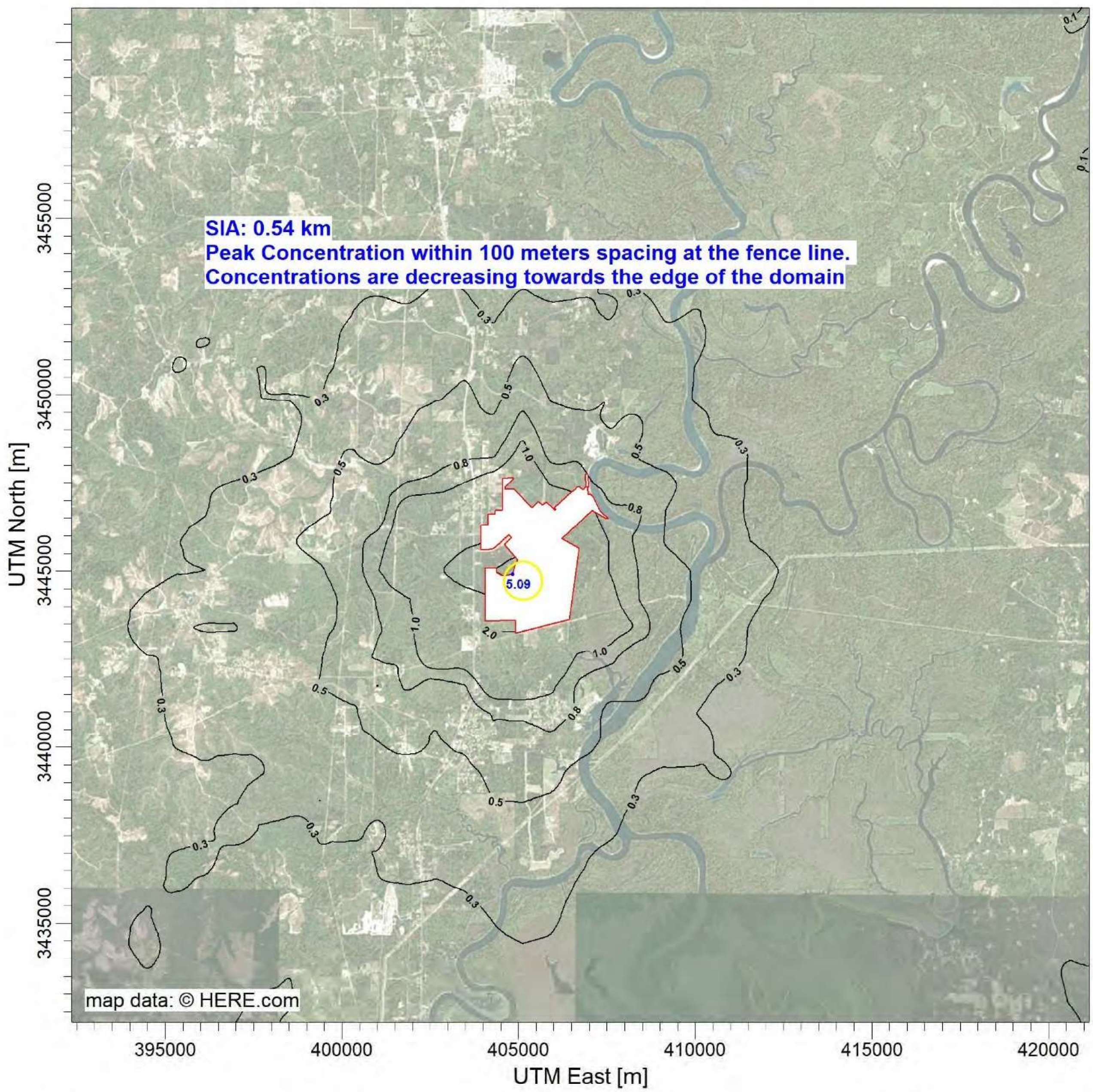


FIGURE A-4 $PM_{2.5}$ ANNUAL SIL MODELING RESULTS CONTOUR PLOT AND SIA



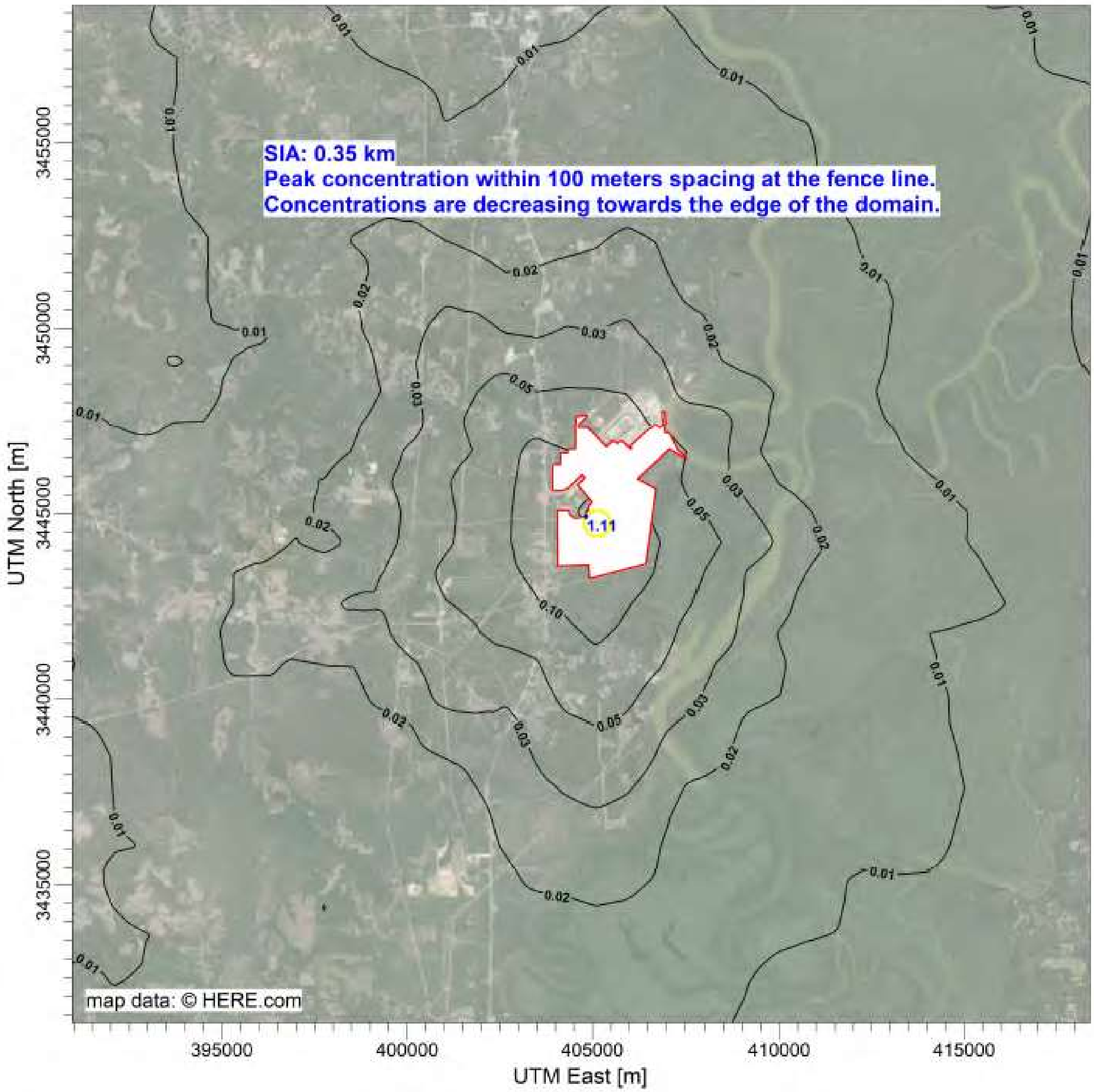
COMMENTS:	SOURCES:		
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	32		
	RECEPTORS: **13433**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:146,250 0 — 5 km	
	MAX: **8.6E-01 ug/m^3**	DATE: **11/8/2024**	PROJECT NO.:

FIGURE A-5 PM_{10} 24-HOUR SIL MODELING RESULTS CONTOUR PLOT AND SIA



COMMENTS:	SOURCES:	
Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	**32**	
	RECEPTORS: **13433**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:180,884 0 — 5 km
	MAX: **5.1 ug/m^3**	DATE: **12/10/2024**
		PROJECT NO.:

FIGURE A-6 PM_{10} ANNUAL SIL MODELING RESULTS CONTOUR PLOT AND SIA



COMMENTS: Line (Red): Property Boundary Circle (Yellow): SIA Point (Blue): Maximum Ground Level Concentration Location	SOURCES: 32		
	RECEPTORS: 13433		
	OUTPUT TYPE: Concentration	SCALE: 1:172,207 0 — 5 km	
	MAX: 1.11 ug/m^3		PROJECT NO.:

APPENDIX B: MERPS HYPOTHETICAL SOURCE AND OZONE MONITOR JUSTIFICATION

B-1: MERPS Hypothetical Source Justification

The following sections provide justification for using the Autauga County, Alabama MERPs hypothetical source for the AMC Calvert PSD modeling analysis.

B-1-1: PROXIMITY AND METEOROLOGICAL INFLUENCES

The Autauga hypothetical source is located about 212 km northeast of the facility and is the nearest to the Project. The next closest hypothetical sources are in Bay County, Florida (around 248 km southeast of the site), and in Orleans, Louisiana (approximately 213 km southwest of the site). These coastal locations are likely heavily influenced by marine airmasses and meteorology, which can affect the resulting photochemical processes used to develop MERPs. Given the project site is about 50 km away from Mobile Bay, marine influences are not representative of the project site. The other hypothetical source in Alabama is Tallapoosa, but it about 280 km to the northeast of the Project and was deemed too distant to be representative.

B-1-2: TERRAIN AND LANDUSE

Both the Autauga region, shown in Figure B-1, and the Project (Figure 5-3) are in rural settings with some industrialized/urban areas nearby. Therefore, the Autauga hypothetical source is the most representative source for the analysis of ozone and secondary $PM_{2.5}$ MERPs. Figures B-2 and B-3 show topographical maps of the AMC Project and Autauga hypothetical source with 2-km radii, respectively. Autauga is situated at a slightly higher elevation (96 meters) with the terrain dominated by low rolling hills. The Project is at a lower elevation (15 meters) but also features rolling hills, especially to the west of the facility. Therefore, terrain at both locations justifies the hypothetical source selection.

B-1-3: STACK HEIGHTS

Most of the AMC PSD Project sources' release heights are between 10 and 35 m. The Autauga hypothetical source was run at 10 and 90 m, and 10 m was chosen as the most representative. Therefore, secondary $PM_{2.5}$ calculations should be suitably conservative against the Project sources.

FIGURE B-1: AERIAL IMAGERY SURROUNDING AUTAUGA HYPOTHETICAL SOURCE

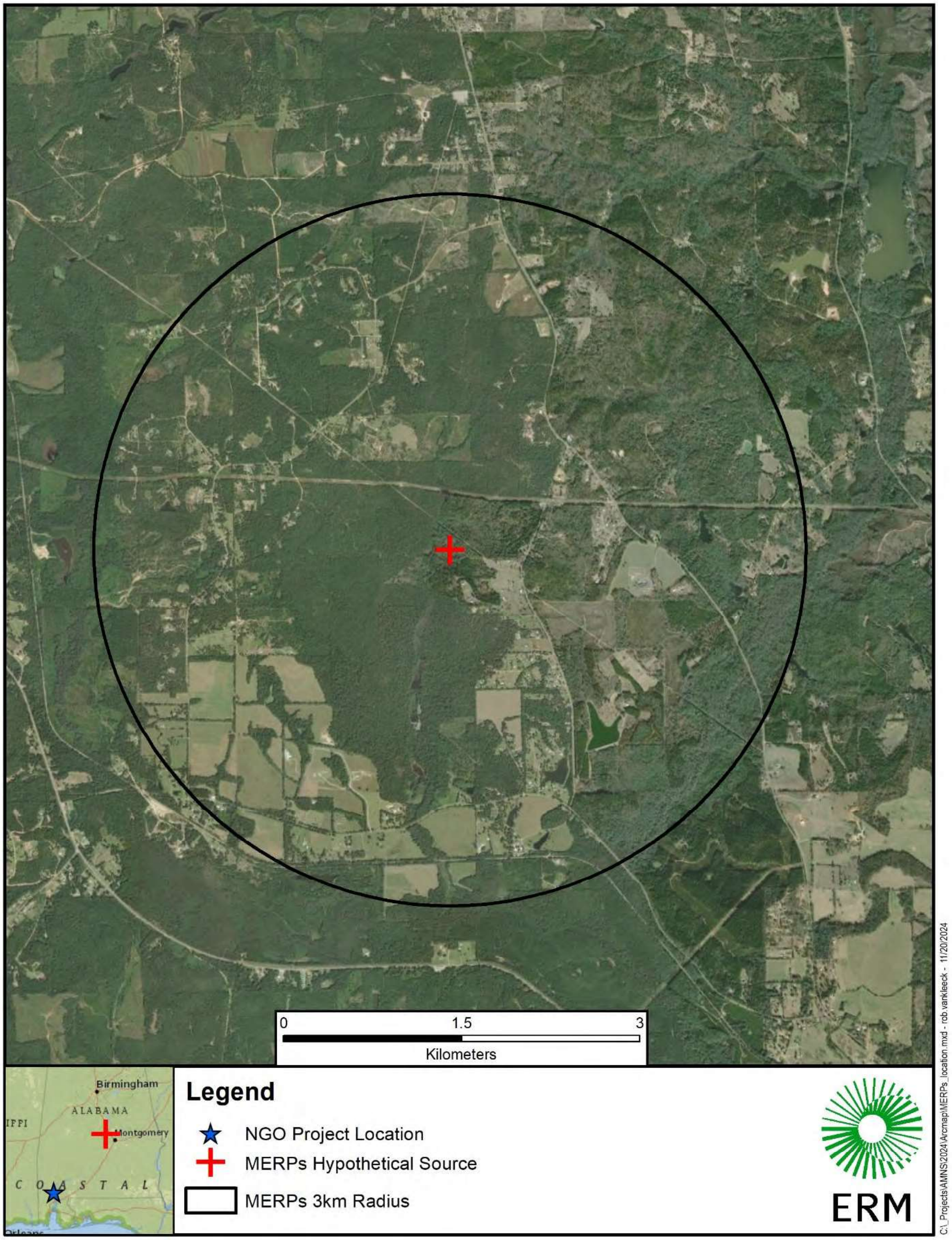


FIGURE B-2: TOPOGRAPHICAL MAP OF AMC PROJECT SITE

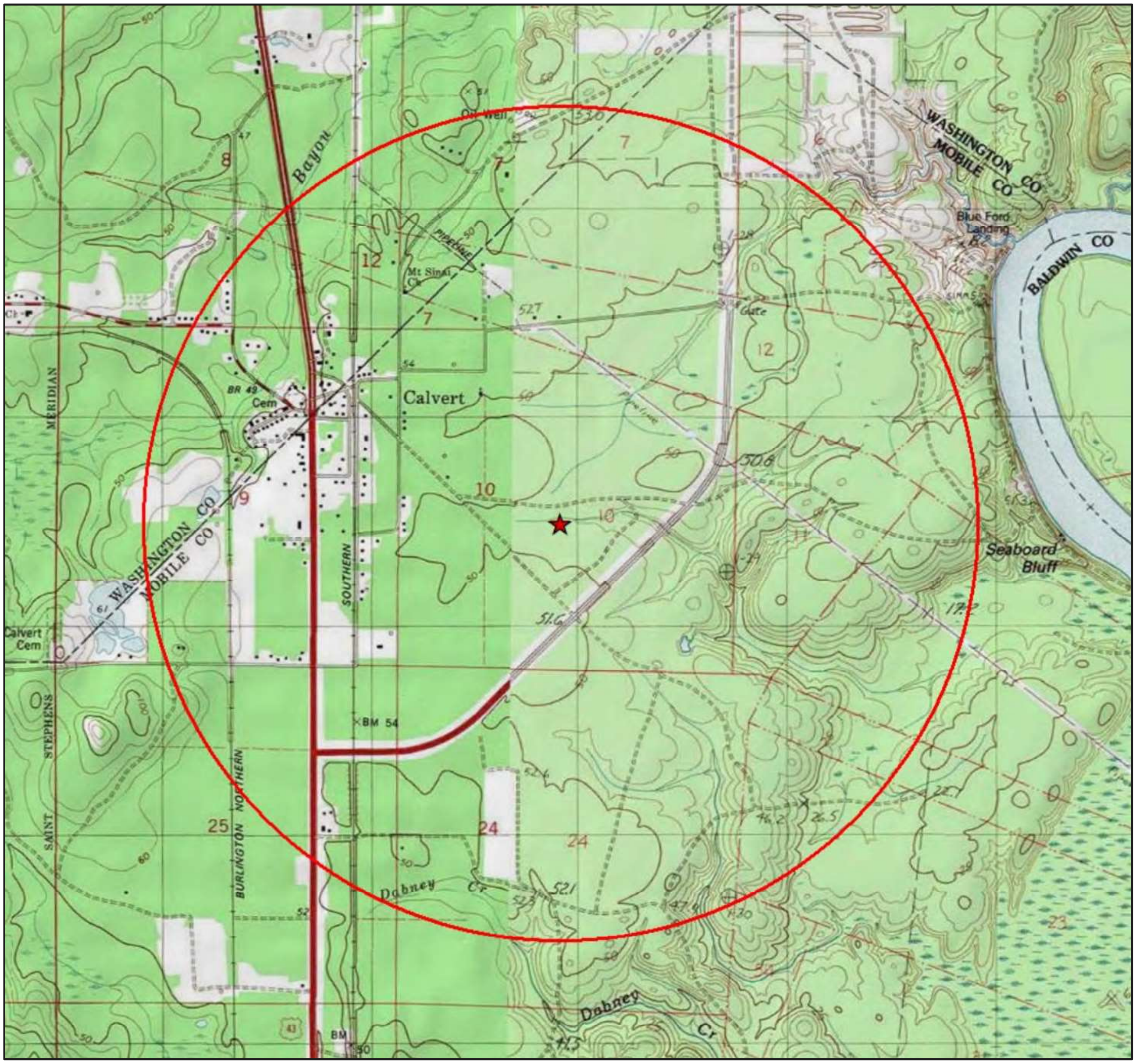
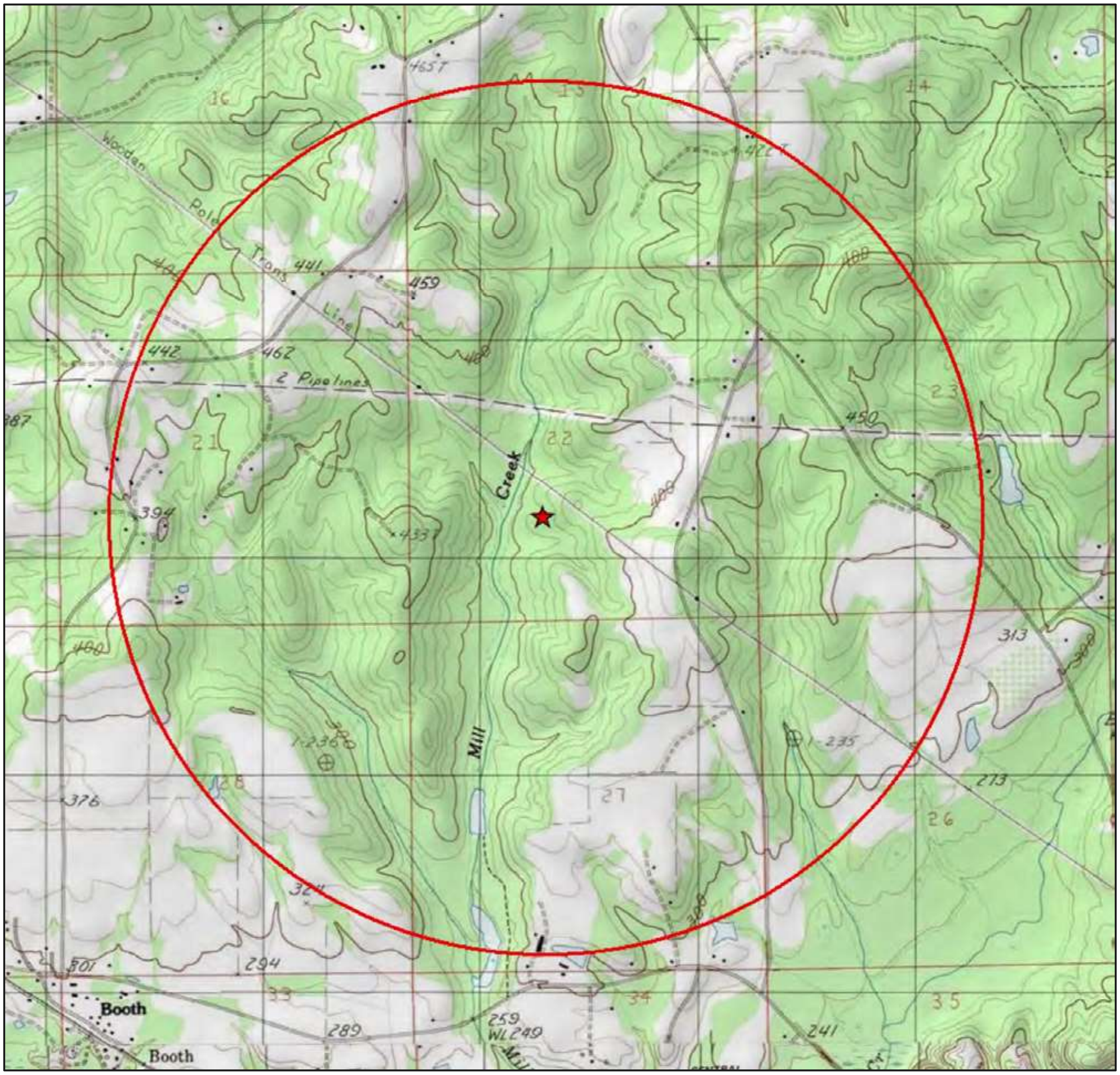


FIGURE B-3: TOPOGRAPHICAL MAP OF AUTAUGA HYPOTHEICAL SOURCE



B-2: Chickasaw Ozone Monitor Justification

The following sections provide justification for using the Chickasaw monitor (ID: 01-097-0003) ozone data for the AMC Calvert PSD modeling analysis.

B-2-4: PROXIMITY AND METEOROLOGICAL INFLUENCES

The Chickasaw monitor is located about 41 km south of the facility and is the nearest to the Project. The next closest active ozone monitor is the Fairhope Alabama monitor, located about 71 km south of the Project. This is significantly closer to the Gulf of Mexico and is likely more heavily influenced by marine airmasses and meteorology than the Chickasaw monitor. Furthermore, the Chickasaw monitor is roughly in the same direction from the Project as the Fairhope monitor, so any downwind impacts from the Mobile metropolitan area would be more representative in the Chickasaw data. The other ozone monitors not in the Mobile metropolitan area are over 130km away to the north and were deemed too distant to be representative.

B-2-5: TERRAIN AND LANDUSE

The Chickasaw monitor is in the northern suburbs of the Mobile Metropolitan area – a more densely populated area than the Project. However, this will provide suitably conservative measurements for use in PSD modeling. The monitor sits at roughly 7.62 meters elevation, which is close to the Project (15 meters).

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