AM/NS CALVERT

December 31, 2020

Mr. Jackson Rogers, P.E.
Environmental Engineer
Air Division
Alabama Department of Environmental Management (ADEM)
1400 Coliseum Blvd.
Montgomery, AL 36110

RE: Updated Prevention of Significant Deterioration (PSD) Air Permit Application AM/NS Calvert, LLC - Carbon Steel Mill

Dear Mr. Rogers:

AM/NS submitted a Prevention of Significant Deterioration (PSD) Air Permit Application for construction and operation of a steelmaking process at the AM/NS Calvert Facility on July 17, 2020. Based on ADEM's review, discussions and subsequent emails, AM/NS is submitting and updated application package with changes incorporating the following items:

- Minor updates to nomenclature;
- Addition of 7 emergency diesel generators (updates made in report text, detailed emission calculations, forms, BACT, and RBLC tables);
- Addition of 2 baghouse dust silos (updates made in report text, detailed emission calculations, forms, and BACT);
- Addition of preheating activities for degassing operation 1 (updates made in report, detailed emission calculations for electric arc furnace 1 (EAF1) and degassing flare 1, and forms for EAF1 and Degassing Operation 1);
- Inclusion of road dust from increased truck traffic (updates made in report, detailed emission calculations, BACT, and RBLC tables);
- Revised emission calculations and forms for EAF's based on changes to EAF VOC and SO_2 BACT emission limits;
- GHG cost analysis for the melt shop included in the BACT;
- CAM plans for the Scarfing WESP and Degassing Flares; and
- Updated modeling files for Class II and AQRV analyses as well as updated modeling reports to support the changes above as well as comments received from ADEM.

Pursuant to ADEM's air permitting guidance, three (3) hard copies of the updates to the application are enclosed.

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ArcelorMittal NIPPON STEEL

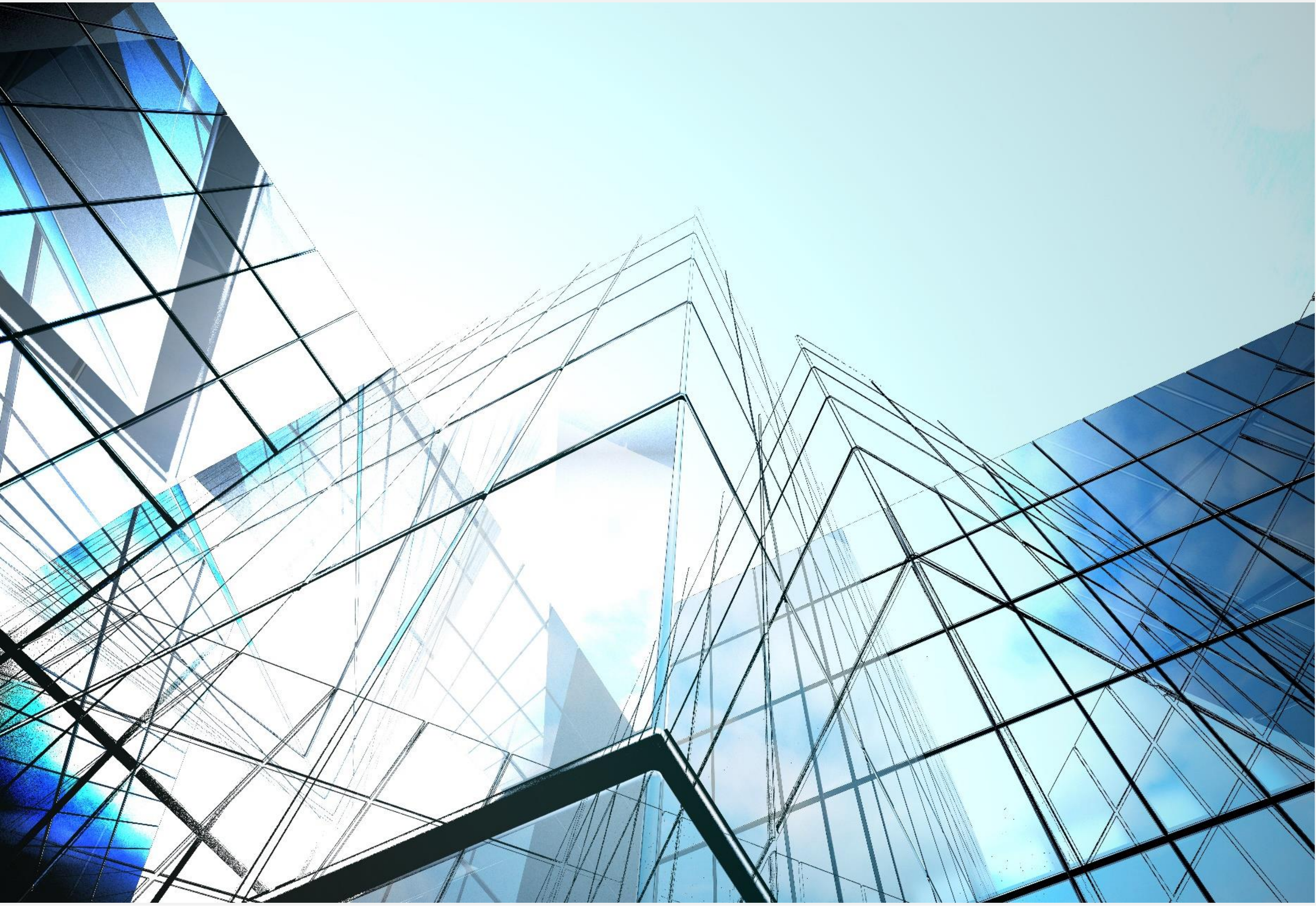
A joint venture between ArcelorMittal and Nippon Steel Corporation

If you have any questions regarding this submittal or need further information, please contact Robert Pinckard at robert.pinckard@arcelormittal.com or (251) 289-4424.

Sincerely,

Shawn Cochran, General Manager

cc: Mr. Charles Green, AM/NS Calvert, Chief Operating Officer



AM/NS Calvert, LLC

Updated Prevention of Significant Deterioration (PSD) Permit Application

December 2020

Project No.: 0426226

The business of sustainability

Signature page

December 2020

Prevention of Significant Deterioration (PSD) Permit Application

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APPENDICES

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1. INTRODUCTION

AM/NS Calvert, L.L.C. (AM/NS) 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 February 24, 2015 (Permit Number 503-0095).

AM/NS is submitting this application to request authorization for the following changes:

1. Construction of two (2) melt shops to reduce reliance on third party raw material providers. Each melt shop will consist of:
   - One (1) Electric Arc Furnaces (EAF);
   - One (1) twin Ladle Metallurgy Furnace (LMF);
   - One (1) Degassing Operation controlled by flare;
   - One (1) Continuous Caster with spray vent, ladle/tundish preheating activities, and associated support equipment; and
   - A total of seven (7) Emergency Diesel Generators [three (3) 2,700 kW, two (2) 2,000 kW, and two (2) 250 kW] for both melt shops.

   Each melt shop will be controlled by one (1) new baghouse for control of emissions. In addition to the melt shops, the project will include installation of auxiliary equipment including one (1) new contact cooling tower, scrap and raw material handling operations, material storage silos, and a scarfing operation for slabs.

   The construction of the melt shops is proposed to be conducted in phases. Phase 1 will include the installation of the first set of melt shop and auxiliary equipment and Phase 2 will include the installation of the second melt shop and auxiliary equipment. The emission sources and potential emissions from both phases are included in this permit application.
2. AM/NS proposes to increase the annual steel production capacity of the Hot Strip Mill (HSM) from 5.5 million metric tons to 6 million metric tons based on improved utilization of the HSM. This increased utilization is not associated with the construction of the two melt shops and is solely based on improved performance and operations of the HSM. No physical modifications will be made to the HSM to achieve the increase in annual capacity, AM/NS is not requesting any changes to HSM permitted emission rates, and no downstream sources from the HSM will be affected by this increase in capacity.

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 – Updated Emission calculations and PSD Applicability Analysis calculations;
- Appendix C – Updated ADEM Permit Application Forms;
- Appendix D – Updated Best Achievable Control Technology (BACT) Analysis;
- Appendix E – Updated Supporting Documentation for BACT Analysis;
- Appendix F – Updated Compliance Assurance Monitoring (CAM) Plan; and
- Appendix G – Updated 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.

The raw materials in the production of steel strip are steel slabs that are currently barged to the facility from Brazil or received from other locations or suppliers. Steel slabs are heated and rolled to form a flat strip in the HSM. From the HSM, the coils (flat strips) are prepared for sales or proceed to the pickling lines. After pickling, if needed, the strips may be cold-rolled to customer specifications and then sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

1.2 Description of Proposed Changes

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

1.2.1 New Melt Shops

With this application, AM/NS proposes to construct two melt shops which will allow AM/NS to produce the steel slabs which are currently imported. A process flow diagram for the proposed project is included in Appendix A of this application package.

The new equipment part of the proposed project will consist of the new melt shops and auxiliary sources where steel scrap and other alternative iron units will be charged and melted in an EAF. Steel scrap and other alternative iron units will be placed into the EAF where they will be charged and then melted. The resulting molten steel will be poured out of the EAF via tapping operations into a ladle which will then transfer the molten steel to a continuous caster where slabs will be formed. The slabs will leave the melt shop and be processed in the HSM and if needed may be cold-rolled after the HSM to customer specifications and then either sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

AM/NS is proposing to install two new melt shop in two phases. The proposed melt shop project will consist of the following new emission sources:

- Two (2) Electric Arc Furnaces (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations) and associated baghouses;
- One (1) Contact Cooling Tower for Casting (Cooling Tower will be sized for casting from both EAFs);

- Two (2) Caster Steam Exhausts (Direct contact cooling water for Casting);
- Slag Handling Operations;
- Storage Piles (scrap and raw material handling operations) and Material Transfer;
- Two (2) Degassing Operations controlled by Flares (1 Vacuum Tank Degassing (VTD) Flare and 1 Ruhrstahl-Heraeus (RH) Flare, the Degassing Operation for the RH flare will have associated preheating activities). One (1) EAF will have a VTD operation and the other EAF will have the RH operation;
- 24 silos for the storage of alloys;
- Ten (10) silos for the storage of lime, dolomite and bauxite;
- Eight (8) silos for the storage of direct reduced iron (DRI);
- Five (5) silos for the storage of flux injection materials;
- Four (4) silos for the storage of hot briquetted iron (HBI);
- Two (2) silos for the storage of baghouse dust;
- Scarfing Operations and associated Electrostatic Precipitator (ESP);
- Road dust from increased traffic; and
- Seven (7) Emergency Diesel Generators.

Melting, Refining and Casting

Each proposed new single shell EAF will be powered by a transformer and natural gas-fired oxygen/fuel burners. The EAFs will operate in a batch mode whereby the scrap steel and scrap substitutes will be charged, melted, and then tapped to a ladle. Various fluxing agents will be added to remove impurities, which will float to the top as slag.

A tilting mechanism will allow the EAF to be de-slagged and tapped to pour the melt into transfer ladles. Ladles will be preheated indirectly via natural gas combustion. Each of the proposed EAFs will be equipped with a direct evacuation control (DEC) system (e.g., direct shell evacuation system or DSES) and an overhead roof exhaust system consisting of a canopy hood. Emissions generated during charging, material handling, melting, refining, tapping, and de-slagging will be captured and vented to a new melt shop Baghouse. The temperature of the exhaust gas from the EAFs will approach 3,000°F. The temperature of the exhaust stream after it is cooled from each of the New Melt Shop baghouses will be approximately 250°F.

Molten steel will be transferred by ladle to the twin LMF for steel refining. Each twin LMF will be equipped with a direct capture system that will capture and vent emissions to the corresponding New Melt Shop Baghouse.

During the steelmaking process, while molten steel is in the ladle and before it is poured, the steel (approximately 30%) must be degassed to remove unwanted gases that are dissolved in the liquid. Emissions from degassing will be routed to a flare for control.

Ladles of molten steel will be transferred from the degassing operations or LMF by crane to the new Continuous Caster. The molten steel will drain into a vertical, water-cooled mold that is the desired width and thickness of the resulting slab. The continuous steel slab will exit at the bottom of the spray chamber where it will be torch cut at specified lengths into discreet slabs. Emissions generated during the casting process will be captured by the canopy hoods and vented to the corresponding melt shop baghouse. The design and fan sizing proposed with the robust roof exhaust system, canopy hoods and localized capture implemented throughout the melt shop will create a negative pressure in the building such that potential fugitive emissions from these activities will be captured and vented to the melt shop baghouse; thus the potential fugitive emissions from these sources, if not captured by the canopy hoods and localized capture, will be captured by the roof exhaust system and vented to the melt shop baghouses. Steam generated from direct cooling will be captured by the caster steam exhaust system and released to the atmosphere through an emission stack on the roof.

Auxiliary Equipment and Activities

Slag Handling

In the production of carbon steel, EAF slag will be generated and will require handling procedures. EAF slag will still contain valuable metallic compounds remaining from melting. Recycled slag will be used to produce an aggregate suitable for beneficial use in various agricultural and construction applications.

AM/NS is proposing to install a slag handling operation that includes the storage, handling, crushing and sizing of slag. The system will be located outside of the melt shop. The sizing operation will be a damp process. Water will be utilized to minimize dust.

Unprocessed slag will be stored in piles outside. The unprocessed slag will be fed into a vibrating grizzly feed (VGF) hopper. The material that makes it through the VGF will be segregated and transported onto a main feed belt. The magnetic material will proceed to a shaker deck where it will be separated into three (3) sizes. The non-magnetic slag will proceed into a slag shaker. The oversized slag will route to the crusher.

Scarfing

AM/NS is proposing to install a scarfing operation in order to support Melt Shop Operations. Scarfing is performed in order to remove surface material from the cast slab and improve the surface quality of the finished steel sheet. The cooled slabs will be loaded onto a rolling table using a crane. The slab is transported via rollers to the aligning table to be adjusted before being automatically fed through the scarfing machine. The scarfing process involves the slabs being torched on two sides at a time. The torching accomplishes the removal of surface materials by causing these materials to undergo a thermochemical exothermic reaction of oxygen and fuel gas. Once the slab passes through the scarfing machine, it is flipped and sent back through in order to torch the remaining two sides. Scarfing emissions will be controlled via the use of an electrostatic precipitator (ESP).

Storage Silos

AM/NS is proposing to install the following silos for the storage of raw materials and baghouse dust:

- 24 silos for the storage of alloys;
- Ten (10) silos for the storage of lime, dolomite and bauxite;
- Eight (8) silos for the storage of direct reduced iron (DRI);
- Five (5) silos for the storage of flux injection materials;
- Four (4) silos for the storage of hot briquetted iron (HBI); and
- Two (2) silos for the storage of baghouse dust.

These storage silos will be equipped with bin vent filters to control emissions.

Contact Cooling Tower

Due to additional cooling water demand for the new melt shops, one (1) new contact cooling water tower will be installed to manage and recycle contact water during casting operations. Emissions from the cooling tower will be controlled via the use of high-efficiency drift eliminators.

Scrap and Raw Material Storage Yard

The melt shop will receive raw materials (scrap, alloys, and additives) by barge, rail and trucks. The scrap will be inspected and managed in accordance with the facility's scrap management plan. Scrap for the EAF will be charged with alloys and additions as determined by the charge calculation. Based on the size of the scrap handled, particulate emissions will be negligible. The smaller sized raw materials will be kept in storage piles and emission calculations are provided for storage and material transfer in Appendix B of this application. Wet suppression will be utilized, as appropriate, to control emissions from the raw materials storage piles.

Scrap Torching

Natural gas fired torches will be used to cut scrap which is too large. Cutting operations will occur outside. As shown in the emission calculations in Appendix B, based on the estimated annual fuel usage for this activity, it is assumed that this activity will be classified as insignificant as per AAC 335-3-16-.01(o).

Slab Cutting

Natural gas fired torches will be used to cut the casted slab. As shown in the emission calculations in Appendix B, based on the estimated annual fuel usage for this activity, it is assumed that this activity will be classified as insignificant as per AAC 335-3-16-.01(o).

Road Dust from Increased Traffic

As part of the proposed project, there will be emissions from road dust due to increased traffic to existing roadways. This includes increased traffic on both paved and unpaved roads. Wet suppression methods will be utilized to control emissions from unpaved roads and good housekeeping practices will be implemented such as posting and enforcing speed limits to prevent loose materials from becoming airborne during transportation. Paved roadways will be periodically swept to remove dust and loose materials.

1.2.2 Increase Hot Strip Mill Production Capacity

AM/NS is also proposing to increase the annual steel production capacity of the HSM from 5.5 million metric tons to 6 million metric tons. This increase in production capacity is based on increased utilization due to better than expected performance and operations of the HSM as a result of improved efficiencies of the current operation. As such, this increase in production capacity can be achieved without any physical modifications to the HSM. Additionally, the proposed increase in the production of the HSM is unrelated to the construction of the new melt shops. The proposed melt shop will replace existing imported slabs, and the lack of slabs is not preventing the HSM from achieving the proposed 6 million metric tons. The production increase is required to meet business demands and can be achieved even without the project to construct the new melt shops by continuing to use the external sources of steel slabs. As stated earlier, the purpose of the melt shop project is solely to replace the external source of steel slabs with internally produced steel slabs thus reducing reliance on third party raw material providers.

The rolled strips from the HSM associated with the increase in production capacity will be directly prepared for sale and as such, the pickling or galvanizing lines are not expected to experience any increased throughput.

2. EMISSION CALCULATIONS

This section provides a detailed description of the emission sources proposed as part of this permit application along with a discussion of the emission calculation methodology.

2.1 Electric Arc Furnaces

As discussed in Section 1.1.1, there are a number of activities in the melt shop associated with the EAF operation (charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations). One (1) EAF will also have preheating activities for the RH degassing operation which are similar in nature to the ladle/tundish preheating activities. The EAFs will be equipped with a direct evacuation control system and an overhead roof exhaust system consisting of a canopy hood. The other activities mentioned will have direct capture systems or local hoods. All of these collective emissions from the melt shop will be routed to the EAF baghouses.

Particulate emissions for these activities are estimated based on the expected exhaust characteristics or grain loading from the baghouses. Other pollutant emissions factors are in the form of pounds per ton (lb/ton) and were provided by the original equipment manufacturer (OEM)/vendor. Greenhouse gas emissions are based on process emissions as well as combustion emission factors for Electric Arc Furnaces from an EPA technical support document[1].

Natural gas combustion emissions associated with ladle preheating activities will also be routed to the melt shop baghouses via the canopy hoods. These emissions are estimated based on emission factors from AP-42 Section 1.4, Natural Gas Combustion (July 1998). Greenhouse gas emissions from natural gas combustion were estimated based on 40 CFR Part 98 Subparts A and C.

2.2 Contact Cooling Tower

The contact cooling tower will provide the necessary cooling water required for the casting operations. Emissions from the cooling tower will be controlled via the use of high-efficiency drift eliminators.

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[2].

2.3 Contact Cooling Tower Steam Exhaust from Casting

The direct contact cooling water used for casting will create steam. Steam formed from the contact of cooling water with the hot steel will vent through a designated Caster Spray Vent. Each Caster Spray Vent will have the potential to emit PM. The primary purpose of the Caster Spray Vents are to remove excess steam from the cooling process. The emissions from this process were estimated based on an expected concentration of PM in the exhaust and an expected exhaust flow rate.

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[1] https://www.epa.gov/sites/production/files/2015-02/documents/tsd_iron_and_steel_epa_9-8-08.pdf

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

2.4 Slag Handling, Storage Piles, and Material Transfer

The emissions from the crushing and sizing of slag were estimated based on emission factors from AP-42, Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing (August 2004). Slag crushing is considered to be tertiary crushing. AM/NS will control emissions from the crushing and sizing process by utilizing wet suppression.

The emissions associated with the slag and raw materials storage piles and the material transfer (drop points) were estimated based on dimensions of the piles, average wind speed, storage duration, transfer rates, AP-42 Section 13.2.4, Aggregate Handling and Storage Piles (November 2006), and AP-42 Table B.2-1, Typical Control Efficiencies of Various Particulate Control Devices; Dust Suppression by Chemical Stabilizer or Wetting Agents.

2.5 Degasser Flares

The degassing operations will utilize oxygen injection to produce ultra-low carbon grades of steel. The oxygen blowing provides forced decarburization and chemical reheating, as required. The primary purpose of the degassing is to decarburize, desulfurize, and subsequently remove nitrogen. Sulfur will be retained in the slag and not emitted as sulfur dioxide (SO_2). Process gasses from each degassing operation will be exhausted to a vent stack and controlled by a flare. The flare will have a natural gas-fired pilot. The RH degassing process design includes an additional oxy fuel-fired burner/lance for preheating.

Natural gas combustion emissions associated with the flare are estimated based on emission factors from AP-42 Section 1.4, Natural Gas Combustion (July 1998). Greenhouse gas emissions from natural gas combustion were estimated based on 40 CFR Part 98 Subparts A and C.

The degassing operation will also have the potential to emit CO and PM. These emissions are based on lb/ton emission factors provided by the OEM/vendor, a control efficiency of 95% for carbon monoxide (CO) emissions, the heat size, and the cycle time. The controlled CO emissions will be oxidized to form carbon dioxide (CO_2).

2.6 Silos

Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions. The emissions for the silos were estimated based on the expected grain loading from the bin vent filters and the expected exhaust flow rates through the bin vent filters.

2.7 Scarfing

Emissions generated during the scarfing process will primarily include PM and will be controlled by an ESP. Additionally, there will be emissions from the natural gas combustion (PM_{10}, $PM_{2.5}$, CO, SO_2, nitrogen oxides (NO_X), volatile organic compounds (VOC), hazardous air pollutants (HAP), and greenhouse gas emissions (GHG)) associated with this operation.

The PM emissions were estimated based on an expected concentration in the exhaust and an expected exhaust flow rate.

Natural gas combustion emissions associated with the flare are estimated based on emission factors from AP-42 Section 1.4, Natural Gas Combustion (July 1998). Greenhouse gas emissions from natural gas combustion were estimated based on 40 CFR Part 98 Subparts A and C.

A summary of the Potential To Emit (PTE) from the proposed project involving construction of the two melt shops is provided in Table 2-1. The specific emission calculation details are included in Appendix B.

2.8 Emergency Diesel Generators

The emissions from the seven (7) emergency diesel generators are based on 100 hours of operation per year, per the 40 CFR 60 Subpart IIII annual limit for emergency engines and the BACT. 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.

2.9 Road Dust from Increased Traffic

The emissions from road dust due to increased traffic on existing roadways are based on AP-42 Section 13.2.1, Paved Roads (January 2011) and Section 13.2.2, Unpaved Roads (November 2006). Wet suppression methods will be utilized to control emissions from unpaved roads and good housekeeping practices will be implemented such as posting and enforcing speed limits to prevent loose materials from becoming airborne during transportation. Paved roadways will be periodically swept to remove dust and loose materials.

Table 2-1 Summary of Melt Shop Installation Project Potential to Emit

Pollutant	Annual Emissions Rate (tpy)
PM	523.52
PM_{10}	472.87
$PM_{2.5}$	454.28
CO	4,402.32
SO_2	675.24
NO_x	695.27
VOC	260.16
Lead (Pb)	3.86
Total HAP	6.26
CO_2e	1,652,792.72

3. PSD APPLICABILITY ANALYSIS

AM/NS 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. AM/NS 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 two changes proposed in this application is presented below.

3.1 PSD Applicability Analysis – New Melt Shops

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	Baseline Actual Emissions (tpy)	Project Potential Emissions (tpy)	Net Emissions Increase[3] (tpy)	PSD SER (tpy)	PSD Review Triggered ?
PM	0	523.52	523.52	25	YES
PM_{10}	0	472.87	472.87	15	YES
$PM_{2.5}$	0	454.28	454.28	10	YES
CO	0	4,402.32	4,402.32	100	YES
SO_2	0	675.24	675.24	40	YES
NO_x	0	695.27	695.27	40	YES
VOC	0	260.16	260.16	40	YES
Pb	0	3.86	3.86	0.6	YES
CO_2e	0	1,652,792.72	1,652,792.72	75,000	YES

As shown in Table 3-1, the net emissions increase of each of these PSD pollutants is greater than the respective PSD SERs and therefore, these pollutants are subject to PSD review. Detailed emission

[3] The project emission increases are conservatively assumed to be equal to the net emissions increase.

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 Appendix D of this application. As noted earlier, detailed modeling results for pollutants subject to PSD review will be provided in a separate submittal.

3.2 PSD Applicability Analysis – Hot Strip Mill Production Increase

As stated in AAC 335-3-14-.04(2)(b), the definition of "major modification" requires an analysis of the following two key factors:

- Will the proposed change entail a "physical change in or change in the method of operation of a major stationary source"?
- If so, will the change "result in a significant net emissions increase of any pollutant subject to regulation "?

The definition of a major modification in AAC 335-3-14-.04(2)(b) further states *"….3. A physical change or change in the method of operation shall not include:……. (vi) An increase in the hours of operation or in the production rate, unless such change would be prohibited under any enforceable permit condition which was established after January 6, 1975…..*"

The proposed change to increase the annual production capacity of the HSM from 5.5 million metric tons to 6 million metric tons for the HSM does not require any physical modification or construction. As stated earlier, this production increase is driven by increased market demand and can be achieved based on increased utilization due to better than expected performance and operations of the HSM. Additionally, the proposed increase in the production of the HSM is unrelated to the construction of the new melt shops and can be achieved even without construction of the new melt shops by continuing to use the external sources of steel slabs. As such, this change does not qualify as a "physical change." Further, the definition of a major modification specifically excludes an increase in the hours of operation or in the production rate from being considered a physical change or change in method of operation unless such change would be prohibited under any enforceable permit condition which was established after January 6, 1975. The preamble to the rule [45 FR 52676, 52704 (August 7, 1980)], makes it clear that this exclusion is intended to allow a company to lawfully increase emissions through a simple change in hours or rate of operation up to its potential to emit (unless already subject to any federally enforceable limit) without having to obtain a PSD permit. The proposed increase in annual production of the HSM will not result in an increase to the currently permitted hourly and annual PTE for the HSM as the currently permitted emissions are already based on the maximum design parameters and maximum annual operating time. The potential emissions from the walking beam furnaces are based on the maximum firing rate and 8,760 hours per year of operation. The potential emissions from the roughing and finishing mill are based on a design maximum flow rate and an exhaust grain loading. Based on the nature of the emissions associated with these sources, this increase in annual production will not have an effect on the potential emissions from these sources, and as such the increase in production capacity will not violate any currently federally enforceable limit. Additionally, there are no currently federally enforceable limits on production. Therefore, this proposed change is not considered to be a physical change or change in method of operation and thus not subject to PSD review.

Lastly, the rolled strips from the HSM associated with the increase in production capacity will be directly prepared for sale and as such the pickling or galvanizing lines are not expected to experience any increased throughput above the existing permitted throughput.

4. REGULATORY APPLICABILITY ANALYSIS

This section discusses potentially applicable state and federal air quality regulations and explains why each regulation is or is not considered applicable to the proposed project. Only regulations applicable to the changes proposed in this permit application are considered.

4.1 Federal Air Quality Regulations

4.1.1 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.

4.1.1.1 Subpart A – General Provisions [Applicable]

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.

The degassing flares are not used to comply with applicable subparts of 40 CFR parts 60 and 61; therefore the requirements of 40 CFR §60.18 would not apply to these flares.

4.1.1.2 40 CFR 60 Subpart AAa – Standards of Performance for Steel Plants: Electric Arc Furnaces Constructed After August 17, 1983 [Applicable]

The provisions of this subpart apply to EAFs, argon-oxygen decarburization vessels, and dust handling systems in steel plants producing carbon, alloy, or specialty steels. The rule applies to any such unit installed after August 17, 1983 and sets forth the following provisions:

- The volume of filterable particulate matter emitted from an EAF is limited to 0.0052 grain per dry standard cubic foot (gr/dscf).
- The opacity from the EAF is control device is limited to 3%.
- The opacity from the melt shop is limited to 6%.
- The dust handling system cannot exceed 10% opacity.
- The rule requires installation of a continuous opacity monitoring system (COMS) on each baghouse controlling an EAF. Alternatively, a COMS is not required for any single stack fabric filter or any modular, multi-stack fabric filter if opacity observations are made by a certified Method 9 observer and if the owner installs and operates a bag leak detection system. If the alternative method is

selected, visible emissions observations must be conducted at least once per day for at least three 6-minute periods when the EAF is operating in the melting and refining period (40 CFR §60.273a(c)).

- A furnace static pressure monitoring device is not required on any EAF equipped with a direct evacuation canopy (DEC) system if observations of shop opacity are performed by a certified visible emission observer in accordance with 40 CFR §60.273a(d).

AM/NS proposes to install, calibrate, maintain and operate a COMS for each baghouse controlling an EAF.

AM/NS will equip the EAFs with DEC systems and will perform opacity observations conducted by a certified Method 9 observer in accordance with 40 CFR §60.273a(d).

4.1.1.3 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 seven (7) proposed emergency diesel generators 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, AM/NS will request compliance documentation from the engine manufacturers and will maintain these records. The engines will be maintained according to the manufacturer’s emission-related instructions. Run-time meters will be installed on these engines to monitor their operating times as required by 40 CFR 60.4209(a) and records will be 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. AM/NS will meet this requirement by only burning diesel fuel that has sulfur content of 15 ppm or less in these engines.

4.1.2 National Emissions Standards for Hazardous Air Pollutants

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. AM/NS is a major source for HAPs. An applicability analysis of potentially applicable NESHAP subparts is presented below.

4.1.2.1 Subpart A – General Provisions [Not Applicable]

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, and mandates general control device requirements for all other subparts, as applicable. As AM/NS is not subject to another 40 CFR 63 subpart, as part of this project, the provisions of Subpart A not applicable to this project.

4.1.2.2 Subpart Q – National Emissions Standards for Hazardous Air Pollutants for Industrial Process Cooling Tower [Not Applicable]

The provisions of 40 CFR 63 Subpart Q – NESHAP for Industrial Process Cooling Towers regulate all new and existing industrial process cooling towers that are operated with chromium-based water treatment chemicals and are either major sources or are integral parts of facilities that are major sources as defined in 40 CFR §63.401. The cooling tower proposed as part of this project will not be operated with chromium-based water treatment chemicals and therefore, this regulation is not applicable.

4.1.2.3 40 CFR 63 Subpart XXX – National Emission Standards for Hazardous Air Pollutants for Ferroalloys Production: Ferromanganese and Silicomanganese

The provisions of 40 CFR 63 Subpart XXX – NESHAP for Hazardous Air Pollutants for Ferroalloys Production: Ferromanganese and Silicomanganese regulate new and existing and new ferromanganese and silicomanganese production facilities which are a major source of HAP. AM/NS does not produce either ferromanganese or silicomanganese and therefore, this regulation is not applicable.

4.1.2.4 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 and 2,700 kW emergency diesel generators are subject to this requirement, and will comply by meeting the requirements of NSPS Subpart IIII. No further requirements apply to these engines 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 generators are subject to this requirement and will comply by meeting the requirements of NSPS Subpart IIII. No further requirements will apply to these engines under 40 CFR 63 Subpart ZZZZ.

4.1.2.5 40 CFR 63 Subpart EEEEE – National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries [Not Applicable]

The provisions of 40 CFR 63 Subpart EEEEE – NESHAP for Iron and Steel Foundries 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.*

Mold is defined in 40 CFR §63.7765 as follows:

> *Mold or core making line means the collection of equipment that is used to mix an aggregate of sand and binder chemicals, form the aggregate into final shape, and harden the formed aggregate. This definition does not include a line for making green sand molds or cores.*

AM/NS will not perform these types of molding activities. Instead, AM/NS proposes to utilize a continuous caster to produce slabs of steel that will later be processed in either a hot or cold rolling mill. The preamble of this rule also states that it is intended to regulate industries with North American Industry Classification System (NAICS) codes 331511, 331512, and 331513. The NAICS code for AM/NS is 331111 and therefore, this regulation is not applicable.

4.1.2.6 40 CFR 63 Subpart FFFFF – National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing Facilities [Not Applicable]

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.*

AM/NS does not produce steel from iron ore; the raw material used at AM/NS will consist of scrap steel. Therefore, this regulation is not applicable.

4.1.2.7 40 CFR 63 Subpart YYYYY – National Emission Standards for Hazardous Air Pollutants for Area Sources: Electric Arc Furnace Steelmaking Facilities [Not Applicable]

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

4.1.3 Compliance Assurance Monitoring [Applicable]

The purpose of the Compliance Assurance Monitoring (CAM) rule is to ensure that operators maintain control device performance for certain large control devices at levels that assure compliance. The rule allows operators to design CAM plans based on current requirements and operating practices, to select

representative parameters upon which compliance can be assured, to establish indicator ranges (or procedures for setting ranges) for the parameters, to use testing or other operating data to verify the parameters and ranges, and to correct control device performance problems as expeditiously as practicable.

The CAM rule requires monitoring plans (CAM plans) for emission units at Part 70 major sources that meet all of the following criteria:

1. Are subject to an emission limitation or standard, and

2. Use a control device to achieve compliance, and

3. Have pre-control emissions that exceed or are equivalent to the major source threshold (100 tpy of a criteria pollutant, 10 tpy of a hazardous air pollutant (HAP), or 25 tpy of a group of HAPs).

CAM is required for units using control devices to comply with Federal Clean Air Act (FCAA) standards established prior to 1990. For a unit whose post-control emissions exceed the major source threshold, a CAM plan is required to be submitted with the initial Title V operating permit application (if the application was not deemed complete by April 20, 1998), with an application proposing a significant modification for those Pollutant Specific Emission Units (PSEU) and pollutants affected by the modification, or with the first Title V permit renewal application.

Table 4-1 below provides a summary of the CAM applicability analysis performed for the applicable sources part of this permit application. Apart from the sources listed in Table 4-1, all other sources proposed as part of this project which have control devices, have pre-controlled emissions which do not exceed the major source threshold.

Table 4-1 CAM Applicability

Emission Point ID	Pre-Controlled Pollutant Exceeding Major Source Threshold	Applicable Emission Limit	NSPS or NESHAP Enacted after November 15, 1990 (Y/N)	CAM Applicability (Y/N)
EAF1	Filterable PM	NSPS AAa (0.0052 gr/dscf)	N	Y
EAF2	Filterable PM	NSPS AAa (0.0052 gr/dscf)	N	Y
Scarfing	PM	BACT	N/A	Y
Degassing Flare 1	CO	BACT	N/A	Y
Degassing Flare 2	CO	BACT	N/A	Y

CAM plans for the EAF operations baghouses, scarfing operations, and degassing flares are provided in Appendix F.

4.2 Alabama Air Quality Regulations

AM/NS is located in Mobile County, which is a Class I county designated as attainment for all NAAQS as per AAC 335-3.

4.2.1 Particulate Matter [Applicable]

ADEM regulates PM emissions and opacity from stationary sources in AAC 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.

PM emissions from fuel burning equipment are regulated by the following AAC:

335-3-4-.03 Fuel Burning Equipment

(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 4-1 for the heat input allocated to such source. For sources in Class 1 Counties, interpolation of the data in Table 4-1 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 only applies to fuel burning equipment as defined in AAC 335-3-1-.02; fuel burning equipment for this project includes the ladle/tundish and RH preheating activities, but does not include the emergency diesel generators as they will not be used for indirect heating.

PM emissions from all other process vents are regulated by the following:

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

(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 4-2 for the process weight per hour allocated to such source. For sources in Class 1 Counties, interpolation of the data in Table 4-2 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 applies to all equipment that does not qualify as fuel burning equipment. Therefore, the EAF Operations, Contact Cooling Tower, Slag Handling Operations, Storage Piles and Material Transfer, Degassing Flares, Material Storage Silos, Caster Steam Exhausts, and Scarfing activities are subject to the requirements of this section.

4.2.2 Sulfur Dioxide [Applicable]

Emissions of sulfur dioxide (SO_2) are regulated in AAC Chapter 335-3-5 with the only applicable sections to the AM/NS project being the section on fuel combustion and process industries:

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 ladle/tundish and RH preheating activities. This emission limit will not apply to the emergency diesel generators 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.

335-3-5-.05 Process Industries – General

***(2)** No person shall construct and operate a new or modified sulfur compound emission source that does not meet any and all applicable New Source Performance Standards and utilizes the best available control technology, with consideration to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility.*

***(3)** No person shall construct and operate a new or modified emission source that will cause or contribute to a condition such that either the primary or the secondary sulfur dioxide ambient air quality standards are exceeded in the area.*

AM/NS will comply with the applicable requirements for SO_2.

4.2.3 Carbon Monoxide [Not Applicable]

Emissions of CO are regulated in AAC 335-3-7. However, the only potentially applicable rule is AAC 335-3-7.01 Metals Production, which applies to grey iron cupolas, blast furnaces, and basic oxygen steel furnaces. Thus, this regulation is not applicable.

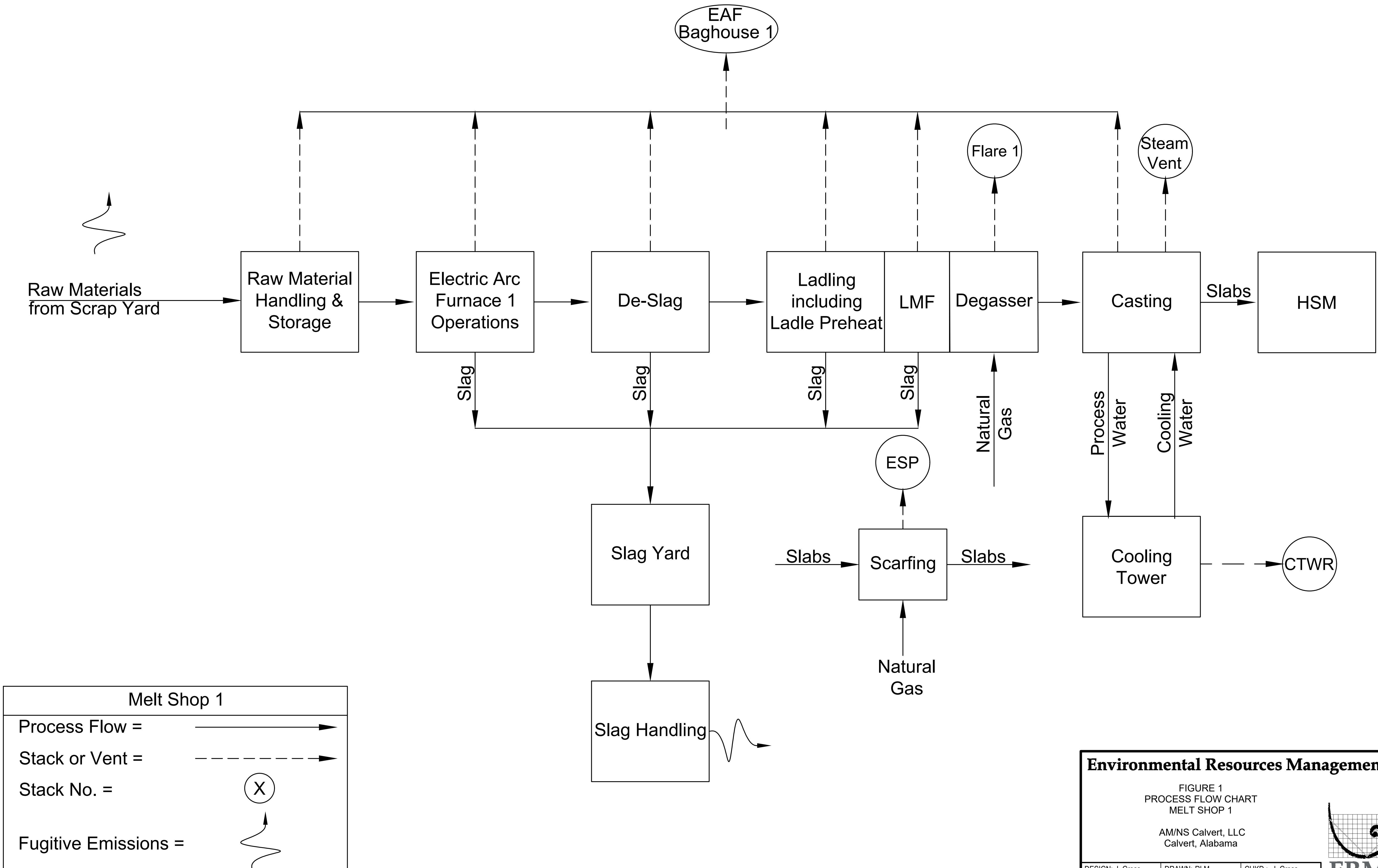
4.2.4 Nitrogen Oxides [Not Applicable]

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.

There will not be any new combustion source with a capacity of 250 MMBtu/hr or greater installed as part of this project; therefore, this regulation does not apply.

APPENDIX A PROCESS FLOW DIAGRAMS

December 2020



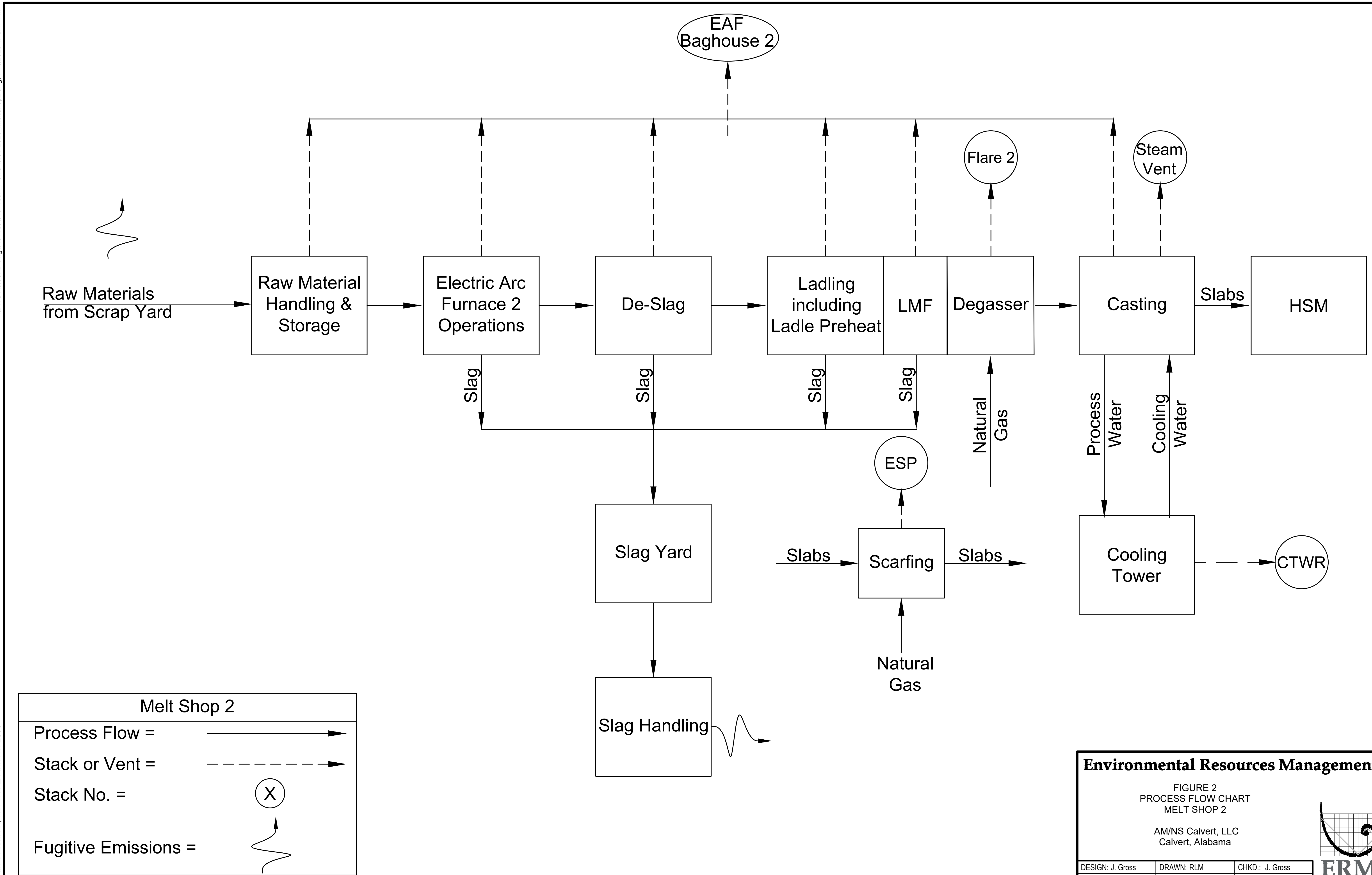
Environmental Resources Management

FIGURE 1
PROCESS FLOW CHART
MELT SHOP 1

AM/NS Calvert, LLC
Calvert, Alabama

DESIGN: J. Gross	DRAWN: RLM	CHKD.: J. Gross
DATE: 7/1/2020	SCALE: AS SHOWN	REV.: 0

ERM



Environmental Resources Management

FIGURE 2
PROCESS FLOW CHART
MELT SHOP 2

AM/NS Calvert, LLC
Calvert, Alabama

DESIGN: J. Gross	DRAWN: RLM	CHKD.: J. Gross
DATE: 7/1/2020	SCALE: AS SHOWN	REV.: 0

ERM

APPENDIX B UPDATED EMISSION CALCULATIONS

December 2020

AM/NS Calvert
Calvert, Alabama
PSD Permit Application for New Melt Shop
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 Sources	1,652,792.72	523.52	472.87	454.28	4,402.32	675.24	695.27	260.16	3.86
PSD Significant Emission Rate (1)	75,000	25	15	10	100	40	40	40	0.6
Over PSD Threshold?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

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

AM/NS Calvert, LLC
Calvert, Alabama

PSD Permit Application for New Melt Shop
Facility Wide New Source Emissions Summary

Source	Description	Total PM	Total PM_{10}	Total $PM_{2.5}$	CO	SO_2	NO_x	VOC	Pb	Benzene	Dichlorobenzene	Formaldehyde	Hexane	2-Methylnaphthalene
		(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
EAF1	Electric Arc Furnace 1 Operations	181.00	181.00	181.00	2,121.95	337.58	337.58	125.39	1.93	9.72E-04	5.55E-04	3.47E-02	8.33E-01	
EAF2	Electric Arc Furnace 2 Operations	181.00	181.00	181.00	2,121.95	337.58	337.58	125.39	1.93	6.82E-04	3.90E-04	2.44E-02	5.85E-01	
CTWR	Contact Cooling Tower	0.44	0.28	0.0009										
SLGH	Slag Handling	0.35	0.16	0.03										
SP_MT	Storage Piles & Material Transfer	36.59	17.30	4.23										
DF1	Degassing Flare #1	1.66	1.66	1.66	126.21	0.049	8.18	0.45	4.09E-05	1.72E-04	9.81E-05	6.13E-03	1.47E-01	
DF2	Degassing Flare #2	0.26	0.26	0.26	25.17	0.003	0.57	0.03	2.83E-06	1.19E-05	6.79E-06	4.24E-04	1.02E-02	
AS	Alloys Storage Silos	0.90	0.90	0.90										
DS	DRI Storage Silos	1.20	1.20	1.20										
LDBS	Lime, Dolomite and Bauxite Storage Silos	0.38	0.38	0.38										
IFS	Injection Flux Storage Silos	0.19	0.19	0.19										
HBIS	Hot Briquetted Iron Storage Silos	0.60	0.60	0.60										
BHS	Baghouse Dust Silos	0.34	0.34	0.34										
CSE1	Caster Steam Exhaust 1	15.06	15.06	15.06										
CSE2	Caster Steam Exhaust 2	15.06	15.06	15.06										
SCF	Scarfing ESP	50.00	50.00	50.00	0.95	0.01	1.13	0.06	0.0000	2.37E-05	1.35E-05	8.46E-04	2.03E-02	
ROAD	Truck Traffic	37.40	6.49	1.44										
IA	Insignificant Activity - Scrap Torching	0.37	0.37	0.37	1.24	0.01	1.47	0.08						
IA	Insignificant Activity - Slab Cutting	0.26	0.26	0.26	0.003	0.00002	0.003	0.0002						
IA	Insignificant Activity - Slab Drop Balling	0.17	0.08	0.01										
EGEN1	Emergency Engine 1	0.06	0.06	0.06	1.04	0.002	1.90	1.90		9.83E-04		9.99E-05		
EGEN2	Emergency Engine 2	0.06	0.06	0.06	1.04	0.002	1.90	1.90		9.83E-04		9.99E-05		
EGEN3	Emergency Engine 3	0.06	0.06	0.06	1.04	0.002	1.90	1.90		9.83E-04		9.99E-05		
EGEN4	Emergency Engine 4	0.04	0.04	0.04	0.77	0.001	1.41	1.41		7.28E-04		7.40E-05		
EGEN5	Emergency Engine 5	0.04	0.04	0.04	0.77	0.001	1.41	1.41		7.28E-04		7.40E-05		
EGEN6	Emergency Engine 6	0.01	0.01	0.01	0.10	0.0002	0.11	0.11		1.09E-04		1.38E-04		
EGEN7	Emergency Engine 7	0.01	0.01	0.01	0.10	0.0002	0.11	0.11		1.09E-04		1.38E-04		
	Total =	**523.52**	**472.87**	**454.28**	**4,402.32**	**675.24**	**695.27**	**260.16**	**3.86**	**0.006**	**1.06E-03**	**0.07**	**1.60**	**0.00E+00**

AM/NS Calvert, LLC
Calvert, Alabama

PSD Permit Application for New Melt Shop
Facility Wide New Source Emissions Summary

Source	Description	Naphthalene	Polycyclic Organic Matter	Toluene	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Manganese
		(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
EAF1	Electric Arc Furnace 1 Operations	2.82E-04	4.08E-05	1.57E-03	5.30E-03		5.55E-06	4.85E-03	6.48E-04	3.89E-05		2.63E-01
EAF2	Electric Arc Furnace 2 Operations	1.98E-04	2.86E-05	1.10E-03	5.27E-03		3.90E-06	4.70E-03	4.55E-04	2.73E-05		2.63E-01
CTWR	Contact Cooling Tower											
SLGH	Slag Handling											
SP_MT	Storage Piles & Material Transfer											
DF1	Degassing Flare #1	4.99E-05	7.21E-06	2.78E-04	1.64E-05		9.81E-07	8.99E-05	1.14E-04	6.87E-06		3.11E-05
DF2	Degassing Flare #2	3.45E-06	4.99E-07	1.92E-05	1.13E-06		6.79E-08	6.22E-06	7.92E-06	4.75E-07		2.15E-06
AS	Alloys Storage Silos											
DS	DRI Storage Silos											
LDBS	Lime, Dolomite and Bauxite Storage Silos											
IFS	Injection Flux Storage Silos											
HBIS	Hot Briquetted Iron Storage Silos											
BHS	Baghouse Dust Silos											
CSE1	Caster Steam Exhaust 1											
CSE2	Caster Steam Exhaust 2											
SCF	Scarfing ESP	6.88E-06	9.95E-07	3.83E-05	2.26E-06		1.35E-07	1.24E-05	1.58E-05	9.47E-07		4.29E-06
ROAD	Truck Traffic											
IA	Insignificant Activity - Scrap Torching											
IA	Insignificant Activity - Slab Cutting											
IA	Insignificant Activity - Slab Drop Balling											
EGEN1	Emergency Engine 1	1.65E-04		3.56E-04								
EGEN2	Emergency Engine 2	1.65E-04		3.56E-04								
EGEN3	Emergency Engine 3	1.65E-04		3.56E-04								
EGEN4	Emergency Engine 4	1.22E-04		2.64E-04								
EGEN5	Emergency Engine 5	1.22E-04		2.64E-04								
EGEN6	Emergency Engine 6	9.94E-06		4.80E-05								
EGEN7	Emergency Engine 7	9.94E-06		4.80E-05								
	Total =	**1.30E-03**	**7.82E-05**	**0.00**	**0.01**	**0.00E+00**	**1.06E-05**	**0.01**	**1.24E-03**	**7.44E-05**	**0.00E+00**	**0.53**

AM/NS Calvert, LLC
Calvert, Alabama

PSD Permit Application for New Melt Shop
Facility Wide New Source Emissions Summary

Source	Description	Mercury (tpy)	Nickel (tpy)	Selenium (tpy)	Xylenes (tpy)	Acetaldehyde (tpy)	Acrolein (tpy)	1,3-Butadiene	CO_2e (tpy)	Total HAP (tpy)
EAF1	Electric Arc Furnace 1 Operations	8.79E-02	9.72E-04	1.11E-05					826,888.87	3.16
EAF2	Electric Arc Furnace 2 Operations	8.79E-02	6.82E-04	7.80E-06					810,412.77	2.90
CTWR	Contact Cooling Tower									
SLGH	Slag Handling									
SP_MT	Storage Piles & Material Transfer									
DF1	Degassing Flare #1	2.13E-05	1.72E-04	1.96E-06					12,033.51	0.15
DF2	Degassing Flare #2	1.47E-06	1.19E-05	1.36E-07					1,145.00	0.01
AS	Alloys Storage Silos									
DS	DRI Storage Silos									
LDBS	Lime, Dolomite and Bauxite Storage Silos									
IFS	Injection Flux Storage Silos									
HBIS	Hot Briquetted Iron Storage Silos									
BHS	Baghouse Dust Silos									
CSE1	Caster Steam Exhaust 1									
CSE2	Caster Steam Exhaust 2									
SCF	Scarfing ESP	2.93E-06	2.37E-05	2.71E-07					1,345.73	0.02
ROAD	Truck Traffic									
IA	Insignificant Activity - Scrap Torching									
IA	Insignificant Activity - Slab Cutting									
IA	Insignificant Activity - Slab Drop Balling									
EGEN1	Emergency Engine 1				2.44E-04	3.19E-05	9.98E-06		207.18	1.89E-03
EGEN2	Emergency Engine 2				2.44E-04	3.19E-05	9.98E-06		207.18	1.89E-03
EGEN3	Emergency Engine 3				2.44E-04	3.19E-05	9.98E-06		207.18	1.89E-03
EGEN4	Emergency Engine 4				1.81E-04	2.36E-05	7.39E-06		153.47	1.40E-03
EGEN5	Emergency Engine 5				1.81E-04	2.36E-05	7.39E-06		153.47	1.40E-03
EGEN6	Emergency Engine 6				3.34E-05	8.99E-05	1.08E-05	4.58E-06	19.18	4.44E-04
EGEN7	Emergency Engine 7				3.34E-05	8.99E-05	1.08E-05	4.58E-06	19.18	4.44E-04
	Total =	**0.18**	**1.86E-03**	**2.13E-05**	**1.16E-03**	**3.23E-04**	**6.64E-05**	**9.17E-06**	**1,652,792.72**	**6.26**

AM/NS Calvert, LLC
Calvert, Alabama
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Emissions Estimates for Electric Arc Furnace Operations

Source:	EAF 1
Description:	Electric Arc Furnace (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations)

Inputs:

Description	Value	Units
Steel Production Rate(1)	331	short ton/hr
Exhaust Flow Rate(2)	1,392,300	dscfm
Annual Production Rate(1)	1,929,043	short ton/yr
Ladle/Tundish Preheating Firing Rate(3)	77.45	MMBtu/hr
Annual Natural Gas Firing for Ladle/Tundish Preheating(4)	662,619.97	MMBtu/yr
RH Preheating Activities Firing Rate(17)	32.89	MMBtu/hr
Annual Natural Gas Firing for RH Preheating Activities(17)	281,406.84	MMBtu/yr
Natural Gas Heating Value	1,020	Btu/ft^3

Emission Factors for EAF Operation(5):

Pollutant	Value(6)	Units
Filterable PM_{10}	0.0018	gr/dscf
Filterable $PM_{2.5}$	0.0018	gr/dscf
Condensable PM	0.0034	gr/dscf
CO	2.2	lb/ton
SO_2	0.35	lb/ton
NO_X	0.35	lb/ton
VOC	0.13	lb/ton
Pb	0.002	lb/ton
Arsenic	5.4E-06	lb/ton
Cadmium	4.5E-06	lb/ton
Manganese	2.7E-04	lb/ton
Mercury	9.1E-05	lb/ton

HAP Emission Factors for Natural Gas Combustion from Ladle/Tundish and RH Preheating:

Pollutant	Value(7)	Units
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	1.8	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

Greenhouse Gas (GHG) Emission Factors for EAF Operations and Natural Gas Combustion from Ladle/Tundish and RH Preheatin

EAF Operations:		
Total CO_2e Emissions(8)	0.40	(metric tons CO2e/ metric tons steel)
Ladle/Tundish and RH Preheating(9):		
CO_2	53.06	kg/MMBtu
CH_4	1.0E-03	kg/MMBtu
N_2O	1.0E-04	kg/MMBtu
Global Warming Potential (GWP)(10):		
CO_2	1	-
CH_4	25	-
N_2O	298	-

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Electric Arc Furnace Operations

Source:	EAF 1
Description:	Electric Arc Furnace (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations)

Emission Calculations for EAF Operations:

Pollutant	Hourly Emissions [11,12]	Annual Emissions[13]
	lbs/hr	tpy
Filterable PM_{10}	21.48	62.65
Filterable $PM_{2.5}$	21.48	62.65
Condensable PM	40.58	118.35
CO	727.52	2121.95
SO_2	115.74	337.58
NO_X	115.74	337.58
VOC	42.99	125.39
Pb	0.66	1.93
Arsenic	0.002	0.01
Cadmium	0.001	0.004
Manganese	0.09	0.26
Mercury	0.03	0.09
CO_2e	-	771,617.00

Emission Calculations for HAP and GHG from Ladle/Tundish and RH Preheating:

Pollutant	Hourly Emissions [14]	Annual Emissions[15,16]
	lbs/hr	tpy
Benzene	0.0002	0.001
Dichlorobenzene	0.0001	0.001
Formaldehyde	0.0081	0.035
Hexane	0.19	0.83
Naphthalene	0.0001	0.0003
Polycyclic Organic Matter	0.00001	0.00004
Toluene	0.0004	0.002
Arsenic	0.00002	0.0001
Beryllium	0.000001	0.00001
Cadmium	0.0001	0.001
Chromium	0.0002	0.001
Cobalt	0.00001	0.00004
Manganese	0.00004	0.0002
Mercury	0.00003	0.0001
Nickel	0.0002	0.001
Selenium	0.000003	0.00001
CO_2	-	55,214.84
CH_4	-	1.04
N_2O	-	0.10
CO_2e	-	55,271.87

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	62.06	181.00
Total $PM_{2.5}$	62.06	181.00
CO	727.52	2121.95
SO_2	115.743	337.58
NO_X	115.74	337.58
VOC	42.99	125.39
Total HAP	0.99	3.16
Pb	0.66	1.93
Benzene	0.0002	0.001
Dichlorobenzene	0.0001	0.0006
Formaldehyde	0.01	0.03
Hexane	0.19	0.83
Naphthalene	0.00007	0.0003
Polycyclic Organic Matter	0.00001	0.00004
Toluene	0.0004	0.002
Arsenic	0.002	0.01
Beryllium	0.000001	0.000006
Cadmium	0.002	0.005
Chromium	0.0002	0.0006
Cobalt	0.00001	0.00004
Manganese	0.09	0.26
Mercury	0.03	0.09
Nickel	0.0002	0.001
Selenium	0.000003	0.00001
CO_2e	-	826,888.87

Source:	EAF 1
Description:	Electric Arc Furnace (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations)

Notes:

(1) Steel production rate is based on call between AM/NS, ERM, and Vendor on 1-10-2019.

(2) Exhaust flow rate based on information from Vendor.

(3) Natural Gas firing from information supplied by vendor on 7-13-2018.

(4) Based on 310 days per year of operation with 15% safety factor.

(5) Emissions from EAF Operation include charging, material handling, melting, slagging, tapping, vacuum tank degassing, casting, ladle/tundish preheating, and ladle operations

(6) Pollutant emission factors based on BACT Analysis submitted with melt shop expansion project and information supplied by vendor.

(7) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998).

(8) Emission factor based off of process emission plus combustion emission factors for Electric Arc Furnaces from EPA technical support document found at: https://www.epa.gov/sites/production/files/2015-02/documents/tsd_iron_and_steel_epa_9-8-08.pdf

(9) Default emission factors from 40 CFR 98 Subpart C, Tables C-1 and C-2, for natural gas.

(10) Default global warming potentials from 40 CFR 98 Subpart A, Table A-1.

(11) Calculation of all pollutant emission rates (excluding PM) follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (lb/ton) X Steel Production Rate (ton/hr)

(12) Calculation of PM emission rates follows the method below:

PM Emission Rate (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (gr/dscf) X (60 min/hr) / 7,000 (grains/lb)

(13) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Production Rate (tons/yr) X Emission Factor (lb/ton) / 2,000 (lb/ton)

(14) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (lb/10^6 ft^3) X Natural Gas Firing Rate (MMBtu/hr) / 1,020 (MMBtu/10^6 ft^3)

(15) Annual emission rates (excluding GHGs) calculated using the method below:

Annual Emissions (ton/yr) = Emission Factor (lb/10^6 ft^3) X Natural Gas Firing Rate (MMBtu/yr) / 1,020 (MMBtu/10^6 ft^3) / 2000 (lb/ton)

(16) Annual GHG emission rates calculated using the method below:

Annual Emissions (ton/yr) = Emission Factor (kg/MMBtu) X Natural Gas Firing Rate (MMBtu/yr) X 1000 (g/kg) / 453.6 (g/lb) / 2000 (lb/ton)

CO_2e = CO_2 emissions (ton/yr) X CO_2GWP + CH_4 emissions (ton/yr) X CH_4GWP + N_2O emissions (ton/yr) X N_2OGWP

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Emissions Estimates for Electric Arc Furnace Operations

Source:	EAF 2
Description:	Electric Arc Furnace (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations)

Inputs:

Description	Value	Units
Steel Production Rate[1]	331	short ton/hr
Exhaust Flow Rate[2]	1,392,300	dscfm
Annual Production Rate[1]	1,929,043	short ton/yr
Ladle/Tundish Preheating Firing Rate[3]	77.45	MMBtu/hr
Annual Natural Gas Firing for Ladle/Tundish Preheating[4]	662,619.97	MMBtu/yr
Natural Gas Heating Value	1,020	Btu/ft^3

Emission Factors for EAF Operation[5]:

Pollutant	Value[6]	Units
Filterable PM_{10}	0.0018	gr/dscf
Filterable $PM_{2.5}$	0.0018	gr/dscf
Condensable PM	0.0034	gr/dscf
CO	2.2	lb/ton
SO_2	0.35	lb/ton
NO_X	0.35	lb/ton
VOC	0.13	lb/ton
Pb	0.002	lb/ton
Arsenic	5.4E-06	lb/ton
Cadmium	4.5E-06	lb/ton
Manganese	2.7E-04	lb/ton
Mercury	9.1E-05	lb/ton

HAP Emission Factors for Natural Gas Combustion from Ladle/Tundish Preheating:

Pollutant	Value[7]	Units
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	1.8	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

Greenhouse Gas (GHG) Emission Factors for EAF Operations and Natural Gas Combustion from Ladle/Tundish Preheating:

EAF Operations:		
Total CO_2e Emissions[8]	0.40	(metric tons CO2e/ metric tons steel)
Ladle/Tundish Preheating[9]:		
CO_2	53.06	kg/MMBtu
CH_4	1.0E-03	kg/MMBtu
N_2O	1.0E-04	kg/MMBtu
Global Warming Potential (GWP)[10]:		
CO_2	1	-
CH_4	25	-
N_2O	298	-

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Electric Arc Furnace Operations

Source:	EAF 2
Description:	Electric Arc Furnace (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations)

Emission Calculations for EAF Operations:

Pollutant	Hourly Emissions [11,12]	Annual Emissions[13]
	lbs/hr	tpy
Filterable PM_{10}	21.48	62.65
Filterable $PM_{2.5}$	21.48	62.65
Condensable PM	40.58	118.35
CO	727.52	2121.95
SO_2	115.74	337.58
NO_X	115.74	337.58
VOC	42.99	125.39
Pb	0.66	1.93
Arsenic	0.002	0.01
Cadmium	0.001	0.004
Manganese	0.09	0.26
Mercury	0.03	0.09
CO_2e	-	771,617.00

Emission Calculations for HAP and GHG from Ladle/Tundish Preheating:

Pollutant	Hourly Emissions [14]	Annual Emissions[15,16]
	lbs/hr	tpy
Benzene	0.0002	0.001
Dichlorobenzene	0.0001	0.0004
Formaldehyde	0.0057	0.024
Hexane	0.1367	0.585
Naphthalene	0.00005	0.0002
Polycyclic Organic Matter	0.00001	0.00003
Toluene	0.0003	0.001
Arsenic	0.00002	0.0001
Beryllium	0.000001	0.000004
Cadmium	0.0001	0.0004
Chromium	0.0001	0.0005
Cobalt	0.00001	0.00003
Manganese	0.00003	0.0001
Mercury	0.00002	0.0001
Nickel	0.0002	0.001
Selenium	0.000002	0.00001
CO_2	-	38,755.74
CH_4	-	0.73
N_2O	-	0.07
CO_2e	-	38,795.77

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	62.06	181.00
Total $PM_{2.5}$	62.06	181.00
CO	727.52	2121.95
SO_2	115.743	337.58
NO_X	115.74	337.58
VOC	42.99	125.39
Total HAP	0.93	2.90
Pb	0.66	1.93
Benzene	0.0002	0.001
Dichlorobenzene	0.0001	0.0004
Formaldehyde	0.01	0.02
Hexane	0.14	0.58
Naphthalene	0.00005	0.0002
Polycyclic Organic Matter	0.00001	0.00003
Toluene	0.0003	0.001
Arsenic	0.002	0.01
Beryllium	0.000001	0.000004
Cadmium	0.002	0.005
Chromium	0.0001	0.0005
Cobalt	0.00001	0.00003
Manganese	0.09	0.26
Mercury	0.03	0.09
Nickel	0.0002	0.001
Selenium	0.000002	0.00001
CO_2e	-	810,412.77

Source:	EAF 2
Description:	Electric Arc Furnace (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations)

Notes:

(1) Steel production rate is based on call between AM/NS, ERM, and Vendor on 1-10-2019.

(2) Exhaust flow rate based on information from Vendor.

(3) Natural Gas firing from information supplied by vendor on 7-13-2018.

(4) Based on 310 days per year of operation with 15% safety factor.

(5) Emissions from EAF Operation include charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations

(6) Pollutant emission factors based on BACT Analysis submitted with melt shop expansion project and information supplied by vendor.

(7) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998).

(8) Emission factor based off of process emission plus combustion emission factors for Electric Arc Furnaces from EPA technical support document found at: https://www.epa.gov/sites/production/files/2015-02/documents/tsd_iron_and_steel_epa_9-8-08.pdf

(9) Default emission factors from 40 CFR 98 Subpart C, Tables C-1 and C-2, for natural gas.

(10) Default global warming potentials from 40 CFR 98 Subpart A, Table A-1.

(11) Calculation of all pollutant emission rates (excluding PM) follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (lb/ton) X Steel Production Rate (ton/hr)

(12) Calculation of PM emission rates follows the method below:

PM Emission Rate (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (gr/dscf) X (60 min/hr) / 7,000 (grains/lb)

(13) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Production Rate (tons/yr) X Emission Factor (lb/ton) / 2,000 (lb/ton)

(14) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (lb/10^6 ft^3) X Natural Gas Firing Rate (MMBtu/hr) / 1,020 (MMBtu/10^6 ft^3)

(15) Annual emission rates (excluding GHGs) calculated using the method below:

Annual Emissions (ton/yr) = Emission Factor (lb/10^6 ft^3) X Natural Gas Firing Rate (MMBtu/yr) / 1,020 (MMBtu/10^6 ft^3) / 2000 (lb/ton)

(16) Annual GHG emission rates calculated using the method below:

Annual Emissions (ton/yr) = Emission Factor (kg/MMBtu) X Natural Gas Firing Rate (MMBtu/yr) X 1000 (g/kg) / 453.6 (g/lb) / 2000 (lb/ton)

CO_2e = CO_2 emissions (ton/yr) X CO_2GWP + CH_4 emissions (ton/yr) X CH_4GWP + N_2O emissions (ton/yr) X N_2OGWP

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Contact Cooling Tower

Source:	Contact Cooling Tower
Description:	Contact Cooling Tower

Inputs:

Description	Value	Units
Circulating Water Flow Rate(1)	10,000	gpm
TDS(1)	2,000	ppm
Drift Rate(2)	0.001%	-
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	0.10	0.44
PM_{10}	0.06	0.28
$PM_{2.5}$	0.0002	0.0009

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
PM_{10}(2)	0.06	0.28
$PM_{2.5}$(2)	0.0002	0.0009

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Contact Cooling Tower

Source:	Contact Cooling Tower
Description:	Contact Cooling Tower

Notes:
(1) Data based on engineering estimate.
(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

(6) Calculation of PM emission rates follows the method below:

Hourly PM $_{10}$ Emissions (lb/hr) = Circulating Water Flow Rate (gpm) * Density of Water (lb/gal) *Drift Rate (%) * Total Dissolved Solids (ppm) * 60 (min/hr) /1,000,000 * 63.5%

Annual PM $_{10}$ Emissions (tpy) = Hourly PM $_{10}$ Emissions (lb/hr) * Operating Hours (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Slag Processing Operations

Source:	Slag Handling
Description:	Slag Handling Operations (crushing and sizing)

Inputs:

Description	Value	Units
Total Slag Production [(4)]	48,226	ton/month
Crusher Maximum Operating Rate [(4)]	220	ton/hr

Emission Factors:

Pollutant	Emission Factor[(1)]	Units
Total PM	0.0012	lb/ton
Total PM_{10}	0.00054	lb/ton
Total $PM_{2.5}$	0.00010	lb/ton

Emission Calculations:

Pollutant	Hourly Emissions[(2)] (lbs/hr)	Annual Emissions[(3)] (tpy)
Total PM	0.26	0.35
Total PM_{10}	0.12	0.16
Total $PM_{2.5}$	0.02	0.03

Emissions Summary:

Pollutant	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)
Total PM	0.26	0.35
Total PM_{10}	0.12	0.16
Total $PM_{2.5}$	0.02	0.03

Notes:

(1) Emission factors obtained from AP-42, Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing (August 2004). Slag crushing is considered to be tertiary crushing. As per footnote "b" to AP-42 Table 11.19.2-2, emissions from the crushing process noted as controlled are assumed to utilize wet suppression because AM/NS will utilize wet suppression.

(2) Hourly emission rate calculated as shown below:

Hourly emission rate [lb/hr] = ***(Crusher Maximum Operating Rate [tons/hr] * Emission Factor [lb/ton])***

(3) Annual emission rate calculated as shown below:

Annual emission rate [tpy] = ***(Total Slag Production [ton/month] * 12 month/yr *Emission Factor [lb/ton] / (2,000 lb/ton)***

(4) Operating rates obtained from discussion with vendor. These rates reflect slag processing for entire plant.

AM/NS Calvert, LLC
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Emissions Estimates for Storage Piles and Material Transfer

Source:	Storage Piles and Material Transfer
Description:	Storage Piles and Material Transfer

Inputs

Description	Value	Units
Material storage time	8,760	hrs
Storage duration	365	days
Average Wind Speed [1]	7.5	mph
Annual Slag Throughput [7]	578,713	tons/yr
Slag Material Moisture Content [4]	0.92	%
Annual Raw Materials Throughput [8]	4,676,841	tons/yr
Raw Materials Moisture Content [9]	0.92	%
Control Efficiency of Wind Erosion PM_{10} [2]	90%	%
Control Efficiency of Wind Erosion $PM_{2.5}$ [2]	40%	%
Control Efficiency of Stacker PM_{10} [2]	90%	%
Control Efficiency of Stacker $PM_{2.5}$ [2]	40%	%
Control Efficiency of Material Transfer [3]	75%	%
Slag Pile Height [5]	20	ft
Slag Pile Length (Base) [5]	80	ft
Slag Pile Width (Base) [5]	140	ft
Raw Materials Pile Height [10]	15	ft
Raw Materials Pile Length (Base) [10]	65	ft
Raw Materials Pile Width (Base) [10]	76	ft
Side Slope [6]	37	°
Slag Pile Surface Area [6]	797	m^2
Raw Materials Pile Surface Area [6]	416	m^2

Notes:
1. Average wind speed obtained from wind rose plot of 5 year meteorological data.

2. Values from AP-42 Table B.2-1 *Typical Collection Efficiencies of Various Particulate Control Devices;* Dust Suppression by Chemical Stabilizer or Wetting Agents.

3. US EPA, Section 6; *Industrial Fugitive Emission Controls;* Drop Height Reduction.
4. AP-42 (11/06), Section 13.2.4, Table 13.2.4-1, mean moisture content for slag at an Iron and Steel Production facility.
5. Slag pile dimensions estimated based on information received for storage yard.
6. Assume pile is flat-topped and oval in shape; slope angle is assumed to be 37 degrees.
*Surface Area of Pile = ((Top Width + 2 * Slope Length) * (Base Length - 2 * Base Radius) + (pi * Top Radius ^ 2) + ((pi * Base Radius * (sqrt((Base Radius * tan((Slope Angle))) ^ 2 + Base Radius ^ 2))) -(pi * Top Radius * (sqrt((Top Radius * tan((Slope Angle))) ^ 2 + Top Radius ^ 2)))))*

7. Based on slag production.
8. Based on information received from AM/NS Calvert on July 15, 2020 for bushelling, shredded, home scrap mills, home scrap - MS, P&S, Pig Iron, and HBI.

9. Conservatively estimated based on worst case assumptions for moisture content of various raw materials.
10. Based on information received from AM/NS Calvert on May 4, 2020.

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Emissions Estimates for Storage Piles and Material Transfer

Source:	Storage Piles and Material Transfer
Description:	Storage Piles and Material Transfer

Emissions Summary:

Pollutant	Hourly Emissions (lbs/hr)	Annual Emissions (tpy)
Total PM	8.35	36.59
Total PM_{10}	3.95	17.30
Total $PM_{2.5}$	0.97	4.23

Storage Piles and Material Transfer

Calculation Basis:

Calculation methodology derived from Section 13.2.4, "*Aggregate Handling and Storage Piles,*" dated AP-42 (11/06)
Accounts for stacking and material transfer drops in piles

$$Emission\ Factor\ (lb/ton) = k \cdot 0.0032 \cdot \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Aerodynamic Particle Size Multiplier (k)	
< 30 micrometers [(4)]	**0.74**
< 15 micrometers	0.48
< 10 micrometers	**0.35**
< 5 micrometers	0.2
< 2.5 micrometers	**0.053**

Where:
U = Mean wind speed (mph) for the area [1]
M = Material moisture content (%)[2]
k = Particle size multiplier [3]

Note:
1. Average wind speed obtained from wind rose plot of 5 year meteorological data
2. From AP-42 (11/06), Section 13.2.4.2, Table 13.2.4-1
3. From AP-42 (11/06), Section 13.2.4.3
4. PM is assumed to be equivalent to PM30.

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Emissions Estimates for Storage Piles and Material Transfer

Source:	Storage Piles and Material Transfer
Description:	Storage Piles and Material Transfer

Emission Calculations

Average Annual Particulate (PM) Emissions from Material Storage Pile Transfers

Transfer Location	Annual Throughput	Emission Factor	Number of Drops	Uncontrolled Emissions	Control Efficiency	Emission Rates	
	(tpy)	(lb/ton)		(lb/yr)	%	(lb/hr) [1]	(tpy) [2]
Slag Pile Stacking	578,713	0.011884	5	34,387.51	90%	0.39	1.72
Slag Material Transfer	578,713	0.011884	5	34,387.51	75%	0.98	4.30
Raw Materials Pile Stacking	4,676,841	0.011884	1	55,580.22	90%	0.63	2.78
Raw Materials Material Transfer	4,676,841	0.011884	4	222,320.89	75%	6.34	27.79
Total						**8.35**	**36.59**

Average Annual Particulate (PM_{10}) Emissions from Material Storage Pile Transfers

Transfer Location	Annual Throughput	Emission Factor	Number of Drops	Uncontrolled Emissions	Control Efficiency	Emission Rates	
	(tpy)	(lb/ton)		(lb/yr)	%	(lb/hr) [1]	(tpy) [2]
Slag Pile Stacking	578,713	0.005621	5	16,264.36	90%	0.19	0.81
Slag Material Transfer	578,713	0.005621	5	16,264.36	75%	0.46	2.03
Raw Materials Pile Stacking	4,676,841	0.005621	1	26,287.94	90%	0.30	1.31
Raw Materials Material Transfer	4,676,841	0.005621	4	105,151.77	75%	3.00	13.14
Total						**3.95**	**17.30**

Average Annual Particulate ($PM_{2.5}$) Emissions from Material Storage Pile Transfers

Transfer Location	Annual Throughput	Emission Factor	Number of Drops	Uncontrolled Emissions	Control Efficiency	Emission Rates	
	(tpy)	(lb/ton)		(lb/yr)	%	(lb/hr) [1]	(tpy) [2]
Slag Pile Stacking	578,713	0.000851	5	2,462.89	40%	0.17	0.74
Slag Material Transfer	578,713	0.000851	5	2,462.89	75%	0.07	0.31
Raw Materials Pile Stacking	4,676,841	0.000851	1	3,980.75	40%	0.27	1.19
Raw Materials Material Transfer	4,676,841	0.000851	4	15,922.98	75%	0.45	1.99
Total						**0.97**	**4.23**

1. Controlled Emission Rate (lb/hr) = Uncontrolled Emission Rate (lb/yr) / 8760 hrs/yr * (1- Control Efficiency)
2. Controlled Emission Rate (tons/yr) = Controlled Emission Rate (lb/hr) * 8760 hr/yr / 2000 lb/ton

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Emissions Estimates for Degassing Flare 1

Source:	Flare 1 - Degassing
Description:	Degassing Flare 1 (emissions from degassing and natural gas combustion)

Inputs:

Description	Value	Units
Hourly Degassing Rate(1)	330	ton/hr
Heat Size(1)	187	tons
Cycle Time(1)	34	minutes
Exhaust Flow Rate(2)	3,088	dscfm
Pilot Natural Gas Usage(2)	5,100	scf/hr
Pilot Natural Gas Usage(2)	54,699,072	scf/yr
Degasser Burner/Lance Natural Gas Usage(2)	10.35	MMBtu/hr
Degasser Burner/Lance Natural Gas Usage(2)	111,007	MMBtu/yr
Natural Gas Heating Value	1,020	Btu/ft^3
Annual Degassing Throughput(3)	3,196,699	tons/yr
CO Degassing Control Efficiency(4)	95	%

Emission Factors for Natural Gas Combustion:

Pollutant	Value(5)	Units
Filterable PM_{10}	1.90	lb/10^6 ft^3
Filterable $PM_{2.5}$	1.90	lb/10^6 ft^3
Condensable PM	5.70	lb/10^6 ft^3
CO	84.00	lb/10^6 ft^3
SO_2	0.60	lb/10^6 ft^3
NO_X	100.00	lb/10^6 ft^3
VOC	5.50	lb/10^6 ft^3
Pb	5.00E-04	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	1.8	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

Emission Factors for Degassing:

Pollutant	Value(6)	Units
Filterable $PM_{10/2.5}$	6.52E-04	lb/ton
Uncontrolled CO	1.49	lb/ton

Greenhouse Gas (GHG) Emission Factors for Natural Gas Combustion:

Pollutant	Value(7)	Units
CO_2	53.06	kg/MMBtu
CH_4	1.0E-03	kg/MMBtu
N_2O	1.0E-04	kg/MMBtu
Global Warming Potential (GWP)(8):		
CO_2	1	-
CH_4	25	-
N_2O	298	-

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Emissions Estimates for Degassing Flare 1

Source:	Flare 1 - Degassing
Description:	Degassing Flare 1 (emissions from degassing and natural gas combustion)

Emission Calculations for Natural Gas Combustion:

Pollutant	Hourly Emissions (9)	Annual Emissions(10)
	lbs/hr	tpy
Filterable PM_{10}	0.029	0.16
Filterable $PM_{2.5}$	0.029	0.16
Condensable PM	0.087	0.47
CO	1.28	6.87
SO_2	0.009	0.05
NO_X	1.52	8.18
VOC	0.084	0.45
Pb	0.00001	0.00004
Benzene	0.00003	0.0002
Dichlorobenzene	0.00002	0.0001
Formaldehyde	0.001	0.006
Hexane	0.027	0.15
Naphthalene	0.00001	0.00005
Polycyclic Organic Matter	0.000001	0.000007
Toluene	0.0001	0.0003
Arsenic	0.000003	0.00002
Beryllium	0.0000002	0.000001
Cadmium	0.00002	0.0001
Chromium	0.00002	0.0001
Cobalt	0.000001	0.000007
Manganese	0.00001	0.00003
Mercury	0.000004	0.00002
Nickel	0.00003	0.0002
Selenium	0.0000004	0.000002
CO_2	-	9755.90
CH_4	-	0.18
N_2O	-	0.018
CO_2e	-	9765.98

Emission Calculations for Degassing:

Pollutant	Hourly Emissions (11)	Annual Emissions(12)
	lbs/hr	tpy
Filterable PM_{10}	0.22	1.04
Filterable $PM_{2.5}$	0.22	1.04
CO	24.64	119.34
CO_2	-	2267.53

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Emissions Estimates for Degassing Flare 1

Source:	Flare 1 - Degassing
Description:	Degassing Flare 1 (emissions from degassing and natural gas combustion)

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.33	1.66
Total $PM_{2.5}$	0.33	1.66
CO	25.92	126.21
SO_2	0.009	0.05
NO_X	1.52	8.18
VOC	0.08	0.45
Total HAP	0.03	0.15
Pb	0.00000762	0.0000409
Benzene	0.00003	0.00017
Dichlorobenzene	0.00002	0.000098
Formaldehyde	0.0011	0.0061
Hexane	0.03	0.147
Naphthalene	0.000009	0.000050
Polycyclic Organic Matter	0.0000013	0.000007
Toluene	0.00005	0.00028
Arsenic	0.000003	0.000016
Beryllium	0.0000002	0.0000010
Cadmium	0.00002	0.000090
Chromium	0.00002	0.000114
Cobalt	0.0000013	0.0000069
Manganese	0.000006	0.000031
Mercury	0.000004	0.000021
Nickel	0.00003	0.00017
Selenium	0.0000004	0.0000020
CO_2e	-	12033.51

Source:	Flare 1 - Degassing
Description:	Degassing Flare 1 (emissions from degassing and natural gas combustion)

Notes:

(1) Hourly Degassing Rate is based on data received from vendor on 8-24-2018.

(2) Pilot Natural Gas Usage and Exhaust Flow rate is based on data received from vendor on 9-21-2018. Degasser Burner/Lance natural gas usage based on data provided by AM/NS.

(3) Annual Degassing Throughput is based on EAF throughput.

(4) Based on information supplied by vendor on 8-24-2018.

(5) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998).

(6) Emission factors for PM and CO as a result of degassing were derived from data provided by vendor on 8-24-2018

(7) Default emission factors from 40 CFR 98 Subpart C, Tables C-1 and C-2, for natural gas.

(8) Default global warming potentials from 40 CFR 98 Subpart A, Table A-1.

(9) Calculation of all pollutant emission rates (excluding CO_2e) follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (lb/10^6 scf) X Natural Gas Usage (scf/hr) /10^6

(10) Calculation of all pollutant emission rates (excluding CO_2e) follows the method below:

Annual Emission Rate (ton/yr) = Natural Gas Usage (scf/yr) X Emission Factor (lb/10^6 scf) /10^6 /2000 (lb/ton)

(10) Annual GHG emission rates calculated using the method below:

Annual Emissions (ton/yr) = Emission Factor (kg/MMBtu) X Natural Gas Firing Rate (MMBtu/yr) X 1000 (g/kg) / 453.6 (g/lb) / 2000 (lb/ton)

CO_2e = CO_2 emissions (ton/yr) X CO_2GWP + CH_4 emissions (ton/yr) X CH_4GWP + N_2O emissions (ton/yr) X N_2OGWP

(11) Calculation of PM Degassing emission rates follows the method below:

PM Emission Rate (lb/hr) = Emission Factor (lb/ton) X Hourly Degassing Rate (ton/hr)

(11) Calculation of CO Degassing emission rates follows the method below:

CO Emission Rate (lb/hr) = Emission Factor (lb/ton) X Hourly Degassing Rate (ton/hr) * (1-CO Degassing Control Efficiency)

(12) Annual PM Degassing emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Degassing Throughput (ton/yr) X Emission Factor (lb/ton) /2000 (lb/ton)

(12) Annual CO Degassing emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Degassing Throughput (ton/yr) X Emission Factor (lb/ton) /2000 (lb/ton) X (1- CO Degassing Control Efficiency)

(12) Annual CO_2 Degassing emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Degassing Throughput (ton/yr) X Emission Factor (lb/ton) /2000 (lb/ton) X (CO Degassing Control Efficiency)

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Emissions Estimates for Degassing Flare 2

Source:	Flare 2 - Degassing
Description:	Degassing Flare 2 (emissions from degassing and natural gas combustion)

Inputs:

Description	Value	Units
Hourly Degassing Rate(1)	330	ton/hr
Heat Size(1)	187	tons
Cycle Time(1)	34	minutes
Exhaust Flow Rate(2)	3,088	dscfm
Natural Gas Usage(2)	5,100	scf/hr
Natural Gas Usage(2)	11,317,049	scf/yr
Natural Gas Heating Value	1,020	Btu/ft^3
Annual Degassing Throughput(3)	661,386	tons/yr
CO Degassing Control Efficiency(4)	95	%

Emission Factors for Natural Gas Combustion:

Pollutant	Value(5)	Units
Filterable PM_{10}	1.90	$lb/10^6 ft^3$
Filterable $PM_{2.5}$	1.90	$lb/10^6 ft^3$
Condensable PM	5.70	$lb/10^6 ft^3$
CO	84.00	$lb/10^6 ft^3$
SO_2	0.60	$lb/10^6 ft^3$
NO_X	100.00	$lb/10^6 ft^3$
VOC	5.50	$lb/10^6 ft^3$
Pb	5.00E-04	$lb/10^6 ft^3$
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	1.8	$lb/10^6 ft^3$
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	$lb/10^6 ft^3$

Emission Factors for Degassing:

Pollutant	Value(6)	Units
Filterable $PM_{10/2.5}$	6.52E-04	lb/ton
Uncontrolled CO	1.49	lb/ton

Greenhouse Gas (GHG) Emission Factors for Natural Gas Combustion:

Pollutant	Value(7)	Units
CO_2	53.06	kg/MMBtu
CH_4	1.0E-03	kg/MMBtu
N_2O	1.0E-04	kg/MMBtu
Global Warming Potential (GWP)(8):		
CO_2	1	-
CH_4	25	-
N_2O	298	-

Source:	Flare 2 - Degassing
Description:	Degassing Flare 2 (emissions from degassing and natural gas combustion)

Emission Calculations for Natural Gas Combustion:

Pollutant	Hourly Emissions [9]	Annual Emissions[10]
	lbs/hr	tpy
Filterable PM_{10}	0.010	0.01
Filterable $PM_{2.5}$	0.010	0.01
Condensable PM	0.029	0.03
CO	0.428	0.48
SO_2	0.003	0.003
NO_X	0.510	0.57
VOC	0.028	0.03
Pb	0.000003	0.000003
Benzene	0.00001	0.00001
Dichlorobenzene	0.00001	0.000007
Formaldehyde	0.0004	0.0004
Hexane	0.009	0.01
Naphthalene	0.000003	0.000003
Polycyclic Organic Matter	0.0000004	0.0000005
Toluene	0.00002	0.00002
Arsenic	0.000001	0.000001
Beryllium	0.0000001	0.00000007
Cadmium	0.00001	0.000006
Chromium	0.00001	0.00001
Cobalt	0.0000004	0.0000005
Manganese	0.000002	0.000002
Mercury	0.000001	0.000001
Nickel	0.00001	0.00001
Selenium	0.0000001	0.0000001
CO_2	-	675.16
CH_4	-	0.01
N_2O	-	0.001
CO_2e	-	675.85

Emission Calculations for Degassing:

Pollutant	Hourly Emissions [11]	Annual Emissions[12]
	lbs/hr	tpy
Filterable PM_{10}	0.22	0.22
Filterable $PM_{2.5}$	0.22	0.22
CO	24.64	24.69
CO_2	-	469.14

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.25	0.26
Total $PM_{2.5}$	0.25	0.26
CO	25.07	25.17
SO_2	0.003	0.003
NO_X	0.51	0.57
VOC	0.03	0.03
Total HAP	0.01	0.01
Pb	0.000003	0.000003
Benzene	0.00001	0.00001
Dichlorobenzene	0.00001	0.000007
Formaldehyde	0.0004	0.0004
Hexane	0.01	0.01
Naphthalene	0.000003	0.000003

Source:	Flare 2 - Degassing
Description:	Degassing Flare 2 (emissions from degassing and natural gas combustion)

Polycyclic Organic Matter	0.0000004	0.0000005
Toluene	0.00002	0.00002
Arsenic	0.000001	0.000001
Beryllium	0.0000001	0.00000007
Cadmium	0.00001	0.000006
Chromium	0.00001	0.00001
Cobalt	0.0000004	0.0000005
Manganese	0.000002	0.000002
Mercury	0.000001	0.000001
Nickel	0.00001	0.00001
Selenium	0.0000001	0.0000001
CO_2e	-	1145.00

Notes:

(1) Hourly Degassing Rate is based on data received from vendor on 8-24-2018.

(2) Natural Gas Usage and Exhaust Flow rate is based on data received from vendor on 9-21-2018.

(3) Annual Degassing Throughput is based on EAF throughput.

(4) Based on information supplied by vendor on 8-24-2018.

(5) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998).

(6) Emission factors for PM and CO as a result of degassing were derived from data provided by vendor on 8-24-2018

(7) Default emission factors from 40 CFR 98 Subpart C, Tables C-1 and C-2, for natural gas.

(8) Default global warming potentials from 40 CFR 98 Subpart A, Table A-1.

(9) Calculation of all pollutant emission rates (excluding CO_2e) follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (lb/10^6 scf) X Natural Gas Usage (scf/hr) /10^6

(10) Calculation of all pollutant emission rates (excluding CO_2e) follows the method below:

Annual Emission Rate (ton/yr) = Natural Gas Usage (scf/yr) X Emission Factor (lb/10^6 scf) /10^6 /2000 (lb/ton)

(10) Annual GHG emission rates calculated using the method below:

Annual Emissions (ton/yr) = Emission Factor (kg/MMBtu) X Natural Gas Firing Rate (MMBtu/yr) X 1000 (g/kg) / 453.6 (g/lb) / 2000 (lb/ton)

CO_2e = CO_2 emissions (ton/yr) X CO_2 GWP + CH_4 emissions (ton/yr) X CH_4 GWP +

(11) Calculation of PM Degassing emission rates follows the method below:

PM Emission Rate (lb/hr) = Emission Factor (lb/ton) X Hourly Degassing Rate (ton/hr)

(11) Calculation of CO Degassing emission rates follows the method below:

CO Emission Rate (lb/hr) = Emission Factor (lb/ton) X Hourly Degassing Rate (ton/hr)

(12) Annual PM Degassing emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Degassing Throughput (ton/yr) X Emission Factor (lb/ton) /2000 (lb/ton)

(12) Annual CO Degassing emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Degassing Throughput (ton/yr) X Emission Factor (lb/ton) /2000 (lb/ton) X (1- CO Degassing Control Efficiency)

(12) Annual CO_2 Degassing emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Annual Degassing Throughput (ton/yr) X Emission Factor (lb/ton) /2000 (lb/ton) X (CO Degassing Control Efficiency)

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Emissions Estimates for Material Storage Silos

Source:	Alloys Storage Silos
Description:	Alloys Storage Silos

Inputs:

Description	Value	Units
Number of Silos[1]	24	-
Exhaust Flow Rate[2] per Silo	200	dscfm
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value[3]	Units
Total PM_{10}	0.005	gr/dscf
Total $PM_{2.5}$	0.005	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions [4]	Annual Emissions[5]
	lbs/hr	tpy
Total PM_{10}	0.21	0.90
Total $PM_{2.5}$	0.21	0.90

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.21	0.90
Total $PM_{2.5}$	0.21	0.90

Notes:

(1) Number of silos is based on data received from vendor on 5-13-2020.

(2) Exhaust flow rate is conservatively based on volume of silos provided by vendor.

(3) PM emission factors based on BACT Analysis submitted with melt shop expansion project.

(4) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (dscfm) X 60 (min/hr) /7000 (grains/lb)

(5) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

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Emissions Estimates for Material Storage Silos

Source:	DRI Storage Silos
Description:	DRI Storage Silos

Inputs:

Description	Value	Units
Number of Silos[1]	8	-
Exhaust Flow Rate[2] per Silo	800	dscfm
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value[3]	Units
Total PM_{10}	0.005	gr/dscf
Total $PM_{2.5}$	0.005	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions [4]	Annual Emissions[5]
	lbs/hr	tpy
Total PM_{10}	0.27	1.20
Total $PM_{2.5}$	0.27	1.20

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.27	1.20
Total $PM_{2.5}$	0.27	1.20

Notes:

(1) Number of silos is based on data received from vendor on 5-13-2020.

(2) Exhaust flow rate is conservatively based on volume of silos provided by vendor.

(3) PM emission factors based on BACT Analysis submitted with melt shop expansion project.

(4) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (dscfm) X 60 (min/hr) /7000 (grains/lb)

(5) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Material Storage Silos

Source:	Lime, Dolomite and Bauxite Storage Silos
Description:	Lime, Dolomite and Bauxite Storage Silos

Inputs:

Description	Value	Units
Number of Silos[(1)]	10	-
Exhaust Flow Rate[(2)] per Silo	200	dscfm
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value[(3)]	Units
Total PM_{10}	0.005	gr/dscf
Total $PM_{2.5}$	0.005	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions [(4)]	Annual Emissions[(5)]
	lbs/hr	tpy
Total PM_{10}	0.09	0.38
Total $PM_{2.5}$	0.09	0.38

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.09	0.38
Total $PM_{2.5}$	0.09	0.38

Notes:

(1) Number of silos is based on data received from vendor on 5-13-2020.

(2) Exhaust flow rate is conservatively based on volume of silos provided by vendor.

(3) PM emission factors based on BACT Analysis submitted with melt shop expansion project.

(4) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (dscfm) X 60 (min/hr) /7000 (grains/lb)

(5) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Material Storage Silos

Source:	Injection Flux Storage Silos
Description:	Injection Flux Storage Silos

Inputs:

Description	Value	Units
Number of Silos[(1)]	5	-
Exhaust Flow Rate[(2)] per Silo	200	dscfm
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value[(3)]	Units
Total PM_{10}	0.005	gr/dscf
Total $PM_{2.5}$	0.005	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions [(4)]	Annual Emissions[(5)]
	lbs/hr	tpy
Total PM_{10}	0.04	0.19
Total $PM_{2.5}$	0.04	0.19

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.04	0.19
Total $PM_{2.5}$	0.04	0.19

Notes:

(1) Number of silos is based on data received from vendor on 5-13-2020.

(2) Exhaust flow rate is conservatively based on volume of silos provided by vendor.

(3) PM emission factors based on BACT Analysis submitted with melt shop expansion project.

(4) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (dscfm) X 60 (min/hr) /7000 (grains/lb)

(5) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Material Storage Silos

Source:	Hot Briquetted Iron Storage Silos
Description:	Hot Briquetted Iron Storage Silos

Inputs:

Description	Value	Units
Number of Silos[(1)]	4	-
Exhaust Flow Rate[(2)] per Silo	800	dscfm
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value[(3)]	Units
Total PM_{10}	0.005	gr/dscf
Total $PM_{2.5}$	0.005	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions [(4)]	Annual Emissions[(5)]
	lbs/hr	tpy
Total PM_{10}	0.14	0.60
Total $PM_{2.5}$	0.14	0.60

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.14	0.60
Total $PM_{2.5}$	0.14	0.60

Notes:

(1) Number of silos is based on data received from vendor on 5-13-2020.

(2) Exhaust flow rate is conservatively based on volume of silos provided by vendor.

(3) PM emission factors based on BACT Analysis submitted with melt shop expansion project.

(4) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (dscfm) X 60 (min/hr) /7000 (grains/lb)

(5) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Baghouse Dust Silos

Source:	Baghouse Dust Silos
Description:	Baghouse Dust Silos

Inputs:

Description	Value	Units
Number of Silos[1]	2	-
Exhaust Flow Rate[2] per Silo	895	dscfm
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value[3]	Units
Total PM_{10}	0.005	gr/dscf
Total $PM_{2.5}$	0.005	gr/dscf

Emission Calculations:

Pollutant	Hourly Emissions [4]	Annual Emissions[5]
	lbs/hr	tpy
Total PM_{10}	0.08	0.34
Total $PM_{2.5}$	0.08	0.34

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.08	0.34
Total $PM_{2.5}$	0.08	0.34

Notes:

(1) Number of silos is based on data received on 11-24-2020.

(2) Exhaust flow rate is conservatively based on volume of silos provided by vendor.

(3) PM emission factors based on BACT Analysis submitted with melt shop expansion project.

(4) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (gr/dscf) X Exhaust Flow Rate (dscfm) X 60 (min/hr) /7000 (grains/lb)

(5) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Caster Contact Cooling Tower Steam Exhaust 1

Source:	Caster Steam Exhaust 1
Description:	Caster Direct Contact Cooling Water Steam Exhaust 1

Inputs:

Description	Value	Units
Exhaust Flow Rate(1)	240,000	m^3/hr
Estimated PM Concentration(2)	6.5	mg/m^3
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value(2)	Units
Total PM_{10}	6.5	mg/m3
Total $PM_{2.5}$	6.5	mg/m3

Emission Calculations:

Pollutant	Hourly Emissions (3)	Annual Emissions(4)
	lbs/hr	tpy
Total PM_{10}	3.44	15.06
Total $PM_{2.5}$	3.44	15.06

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	3.44	15.06
Total $PM_{2.5}$	3.44	15.06

Notes:

(1) Based on documentation from vendor received on 5-4-2020

(2) Based on documentation from vendor received on 6-25-2020

(3) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (mg/m3) X Exhaust Flow Rate (m3/hr) /1000(mg/g) --> convert grams to lbs

(4) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Caster Contact Cooling Tower Steam Exhaust 2

Source:	Caster Steam Exhaust 2
Description:	Caster Direct Contact Cooling Water Steam Exhaust 2

Inputs:

Description	Value	Units
Exhaust Flow Rate[(1)]	240,000	m^3/hr
Estimated PM Concentration[(2)]	6.5	mg/m^3
Hours of Operation	8,760	hr/yr

Emission Factors:

Pollutant	Value[(2)]	Units
Total PM_{10}	6.5	mg/m3
Total $PM_{2.5}$	6.5	mg/m3

Emission Calculations:

Pollutant	Hourly Emissions [(3)]	Annual Emissions[(4)]
	lbs/hr	tpy
Total PM_{10}	3.44	15.06
Total $PM_{2.5}$	3.44	15.06

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	3.44	15.06
Total $PM_{2.5}$	3.44	15.06

Notes:

(1) Based on documentation from vendor received on 5-4-2020

(2) Based on documentation from vendor received on 6-25-2020

(3) Calculation of all pollutant emission rates follows the method below:

Hourly Emissions (lb/hr) = Emission Factor (mg/m3) X Exhaust Flow Rate (m3/hr) /1000(mg/g) --> convert grams to lbs

(4) Annual emission rates calculated using the method below:

Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Scarfing Electrostatic Precipitator

Source:	Scarfing ESP
Description:	Electrostatic Precipitator for Scarfing Activities

Inputs:

Description	Value	Units
Average Slab Weight(1)	35.3	short tons
Hourly Slab Throughput(1)	6.0	slabs/hr
Annual Slab Throughput(1)	1,377,888	short tons/yr
Natural Gas Consumption(2)	0.46	m^3/ton
Natural Gas Heating Value	1,020	Btu/scf

Emission Factors:

Pollutant	Value(3)	Units
Total PM_{10}	0.073	lb/ton
Total $PM_{2.5}$	0.073	lb/ton
CO	84.00	$lb/10^6 ft^3$
SO_2	0.60	$lb/10^6 ft^3$
NO_X	100.00	$lb/10^6 ft^3$
VOC	5.50	$lb/10^6 ft^3$
Pb	5.00E-04	$lb/10^6 ft^3$
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	1.8	$lb/10^6 ft^3$
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	$lb/10^6 ft^3$

Greenhouse Gas (GHG) Emission Factors for Natural Gas Combustion:

Pollutant	Value(6)	Units
CO_2	53.06	kg/MMBtu
CH_4	1.0E-03	kg/MMBtu
N_2O	1.0E-04	kg/MMBtu
Global Warming Potential (GWP)(7):		
CO_2	1	-
CH_4	25	-
N_2O	298	-

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Scarfing Electrostatic Precipitator

Source:	Scarfing ESP
Description:	Electrostatic Precipitator for Scarfing Activities

Emission Calculations:

Pollutant	Hourly Emissions (4)	Annual Emissions(5)
	lbs/hr	tpy
Total PM_{10}	15.36	50.00
Total $PM_{2.5}$	15.36	50.00
CO	0.29	0.95
SO_2	0.00	0.01
NO_X	0.35	1.13
VOC	0.02	0.06
Pb	0.000002	0.00001
Benzene	0.00001	0.00002
Dichlorobenzene	0.000004	0.00001
Formaldehyde	0.0003	0.001
Hexane	0.01	0.02
Naphthalene	0.000002	0.00001
Polycyclic Organic Matter	0.0000003	0.000001
Toluene	0.00001	0.00004
Arsenic	0.000001	0.000002
Beryllium	0.00000004	0.0000001
Cadmium	0.000004	0.00001
Chromium	0.000005	0.00002
Cobalt	0.0000003	0.000001
Manganese	0.000001	0.000004
Mercury	0.000001	0.000003
Nickel	0.00001	0.00002
Selenium	0.0000001	0.0000003
CO_2	-	1,345.73
CH_4	-	0.03
N_2O	-	0.003
CO_2e	-	1,347.12

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	15.36	50.00
Total $PM_{2.5}$	15.36	50.00
CO	0.29	0.95
SO_2	0.00	0.01
NO_X	0.35	1.13
VOC	0.02	0.06
Total HAP	0.01	0.02
Pb	0.000002	0.00001
Benzene	0.00001	0.00002
Dichlorobenzene	0.000004	0.00001
Formaldehyde	0.0003	0.001
Hexane	0.01	0.02
Naphthalene	0.000002	0.00001
Polycyclic Organic Matter	0.0000003	0.000001
Toluene	0.00001	0.00004
Arsenic	0.000001	0.000002
Beryllium	0.00000004	0.0000001
Cadmium	0.000004	0.00001
Chromium	0.000005	0.00002
Cobalt	0.0000003	0.000001
Manganese	0.000001	0.000004
Mercury	0.000001	0.000003
Nickel	0.00001	0.00002
Selenium	0.0000001	0.0000003
CO_2e	-	1,345.73

Source:	Scarfing ESP
Description:	Electrostatic Precipitator for Scarfing Activities

Notes:
(1) Based on information from vendor in email 1-30-2019.
(2) Based on information from vendor in email 1-30-2019.
(3) PM emission factors based on documentation from vendor received on 2-04-2019. Other emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998).
(4) Calculation of PM emission rates follows the method below:
Hourly Emissions (lb/hr) = Emission Factor (lb/ton) X Average Slab Weight (tons/slab) X Hourly Throughput (slabs/hr)
Calculation of other pollutant emission rates follows the method below:
Hourly Emissions (lb/hr) = Emission Factor (lb/10^6 ft^3) X 10^6 ft^3/mmscf / Natural Gas Heating Value (Btu/scf) / 10^6 Btu/MMBtu X Natural Gas Usage (MMBtu/hr)
(5) Annual emission rates calculated using the method below:
Annual Emission Rate (ton/yr) = Hourly Emission Rate (lb/hr) X Operating Schedule (hr/yr) / 2,000 (lb/ton)
(5) Annual GHG emission rates calculated using the method below:
Annual Emissions (ton/yr) = Emission Factor (kg/MMBtu) X Natural Gas Firing Rate
CO_2e = CO_2 emissions (ton/yr) X CO_2GWP + CH_4 emissions (ton/yr) X CH_4GWP + N_2O emissions (ton/yr) X N_2OGWP
(6) Default emission factors from 40 CFR 98 Subpart C, Tables C-1 and C-2, for natural gas.
(7) Default global warming potentials from 40 CFR 98 Subpart A, Table A-1.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Truck Traffic

Source:	Truck Traffic
Description:	Road Dust from Truck Traffic

Inputs [1]

Description	Value	Units
Paved Road Traffic		
External Truck (# of vehicles)	10	trucks
External Truck Weight	29	tons
External Truck Roundtrip Distance	3.0	miles
External Truck Trips/Day	20	trips/day
Paved Road Annual Vehicle Miles Traveled	21,900	miles/yr
Unpaved Road Traffic		
River Truck (# of vehicles)	6	trucks
River Truck Weight	31	tons
River Truck Roundtrip Distance	0.9	miles
River Truck Trips/Day	70	trips/day
Bucket Loading Truck (# of vehicles)	4	trucks
Bucket Loading Truck Weight	31	tons
Bucket Loading Truck Roundtrip Distance	0.4	miles
Bucket Loading Truck Trips/Day	128	trips/day
Slag Pot Hauler (# of vehicles)	4	trucks
Slag Pot Hauler Weight	100	tons
Slag Pot Hauler Roundtrip Distance	1.2	miles
Slag Pot Hauler Trips/Day	75	trips/day
Unpaved Road Annual Vehicle Miles Traveled	74,533	miles/yr

Emissions Summary:

Pollutant	Annual Emissions (tpy)
Total PM	37.40
Total PM_{10}	6.49
Total $PM_{2.5}$	1.44

Paved Roads Truck Traffic

Calculation Basis: [2]

Calculation methodology derived from Section 13.2.1, "Paved Roads," dated AP-42 (1/11)
Accounts for particulate emissions from vehicles traveling over a paved surface

$$Emission\ Factor\ (lb/VMT) = [k \cdot (sL)^{0.91} \cdot (W)^{1.02}](1 - \frac{P}{4N})$$

Where:
k = Particle size multiplier
sL = Road surface silt loading
W = Average weight of vehicles traveling road
P = Number of "wet" days with at least 0.01 in of precipitation during averaging period
N = Number of days in averaging period

Emission Calculations

Annual Particulate Emissions from Paved Road Truck Traffic

Transfer Location	Annual VMT	Particle Size Multiplier [3]	Silt Loading [4]	Average Weight	Precipitation Correction [5] 1-(P/4N)	Emission Factor	Emission Rates	
	(miles/yr)	(lb/VMT)	(g/m^2)	(tons)		(lb/VMT)	(lb/yr)	(tpy)
Paved Road Truck Traffic PM	21,900	0.011	9.7	29	0.9	2.4325	53,271	26.64
Paved Road Truck Traffic PM_{10}		0.0022				0.4865	10,654	5.33
Paved Road Truck Traffic $PM_{2.5}$		0.00054				0.1194	2,615	1.31

Annual Particulate Emissions From Vehicle Fleet Exhaust, Brake Wear, and Tire Wear

Transfer Location	Annual Traffic	Emission Factor [6]	Emission Rates	
	(miles/yr)	(lb/VMT)	(lb/yr)	(tpy)
Paved Road Truck Traffic PM	21,900	0.00047	10.29	0.005
Paved Road Truck Traffic PM_{10}		0.00047	10.29	0.005
Paved Road Truck Traffic $PM_{2.5}$		0.00036	7.88	0.004

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for Truck Traffic

Source:	Truck Traffic
Description:	Road Dust from Truck Traffic

Unpaved Roads Truck Traffic

Calculation Basis: [7]
Calculation methodology derived from Section 13.2.2, "Unpaved Roads," dated AP-42 (11/06)
Accounts for particulate emissions from vehicles traveling over an unpaved surface

$$Emission\ Factor\ (lb/VMT) = [k \cdot \left(\frac{s}{12}\right)^a \cdot \left(\frac{W}{3}\right)^b](\frac{365-P}{365})$$

Where:
k = Particle size multiplier
s = Surface material silt content
W = Average weight of vehicles traveling road
a, b = Empirical constants
P = Number of "wet" days with at least 0.01 in of precipitation during averaging period

Empirical Constants [8]	a	b
PM	0.7	0.45
PM10	0.9	0.45
PM2.5	0.9	0.45

Emission Calculations

Annual Particulate Emissions from Unpaved Road Truck Traffic

Transfer Location	Annual VMT	Particle Size Multiplier [11]	Silt Content [9]	Average Weight	Precipitation Correction [10]	Emission Factor	Emission Rates	
	(miles/yr)	(lb/VMT)	(%)	(tons)	(365-P)/365	(lb/VMT)	(lb/yr)	(tpy)
Unpaved Road Truck Traffic PM	74,533	4.9	6%	51	0.7	0.2883	21,491	10.75
Unpaved Road Truck Traffic PM_{10}		1.5				0.0306	2,280	1.14
Unpaved Road Truck Traffic $PM_{2.5}$		0.15				0.0031	228	0.11

Annual Particulate Emissions From Vehicle Fleet Exhaust, Brake Wear, and Tire Wear

Transfer Location	Annual Traffic	Emission Factor [6]	Emission Rates	
	(miles/yr)	(lb/VMT)	(lb/yr)	(tpy)
Unpaved Road Truck Traffic PM	74,533	0.00047	35.03	0.018
Unpaved Road Truck Traffic PM_{10}		0.00047	35.03	0.018
Unpaved Road Truck Traffic $PM_{2.5}$		0.00036	26.83	0.013

Notes:
1. Information provided by AM/NS Calvert on September 18, 2020.
2. Calculation basis and constants used for paved road truck traffic emissions is AP-42 Chapter 13.2.1 "Paved Roads" (1/11).
3. Particle size multiplier values are converted between grams and pounds or miles and kilometers to account for mixed units required in the equation. The units here are pounds/ vehicle miles traveled. Particulate size multipliers are provided in Table 13.2.1-1 "Particle size multipliers for paved road equation" in AP-42 Chapter 13.2.1 "Paved Roads" (1/11).
4. The silt loading factor for "Iron and steel production" is given in Table 13.2.1-3 "Typical silt content and loading values for paved roads at industrial facilities" of AP-42 Chapter 13.2.1 "Paved Roads" (1/11).
5. The "P" in the precipitation correction calculation was assumed to be 120 days/year of 0.01 in of precipitation or greater for the Mobile/Calvert area per NOAA National Centers for Environmental Information.
6. Particulate emissions for vehicle fleet exhaust, brake wear, and tire wear are calculated using the emission factor obtained from EPA's MOBILE6.2 model.
7. Calculation basis and constants used for paved road truck traffic emissions is AP-42 Chapter 13.2.2 "Unpaved Roads" (11/06).
8. Empirical constants a and b for unpaved road calculations for industrial roads are provided in Table 13.2.2-2 "Constants for equations 1a and 1b" of AP-42 Chapter 13.2.2 "Unpaved Roads" (11/06).
9. The silt content % for "Iron and steel production" is given in Table 13.2.2-1 "Typical silt content values of surface material on industrial unpaved roads" of AP-42 Chapter 13.2.2 "Unpaved Roads" (11/06).
10. The "P" in the precipitation correction calculation was assumed to be 120 days/year of 0.01 in of precipitation or greater for the Mobile/Calvert area per NOAA National Centers for Environmental Information.
11. Particulate size multipliers are provided in Table 13.2.2-2 "Constants for equations 1a and 1b" in AP-42 Chapter 13.2.2 "Unpaved Roads" (11/06).

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for CWC Emergency Engine 1

Inputs:

Description	Value	Units
Operating Rate	2,700	kW
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	100	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

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for CWC Emergency Engine 1

Inputs:

Description	Value	Units
Operating Rate	2,700	kW
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	100	hr/yr

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	1.19	0.06
Filterable $PM_{2.5}$	1.19	0.06
Condensable PM	0.03	0.001
CO	20.83	1.04
SO_2	0.04	0.002
NO_X	38.10	1.90
VOC	38.10	1.90
Benzene	0.0197	0.0010
Toluene	0.0071	0.0004
Xylenes	0.0049	0.0002
Propylene	0.0707	0.004
Formaldehyde	0.0020	0.0001
Acetaldehyde	0.0006	0.00003
Acrolein	0.0002	0.00001
Naphthalene	0.0033	0.00016
Total PAH	0.0054	0.0003
CO_2		206
CH_4		0.0084
N_2O		0.0017
CO_{2e}		207

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.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for CWC Emergency Engine 2

Inputs:

Description	Value	Units
Operating Rate	2,700	kW
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	100	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

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for CWC Emergency Engine 2

Inputs:

Description	Value	Units
Operating Rate	2,700	kW
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	100	hr/yr

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	1.19	0.06
Filterable $PM_{2.5}$	1.19	0.06
Condensable PM	0.03	0.001
CO	20.83	1.04
SO_2	0.04	0.002
NO_X	38.10	1.90
VOC	38.10	1.90
Benzene	0.0197	0.0010
Toluene	0.0071	0.0004
Xylenes	0.0049	0.0002
Propylene	0.0707	0.004
Formaldehyde	0.0020	0.0001
Acetaldehyde	0.0006	0.00003
Acrolein	0.0002	0.00001
Naphthalene	0.0033	0.00016
Total PAH	0.0054	0.0003
CO_2		206
CH_4		0.0084
N_2O		0.0017
CO_{2e}		207

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.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for CWC Emergency Engine 3

Inputs:

Description	Value	Units
Operating Rate	2,700	kW
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	100	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

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for CWC Emergency Engine 3

Inputs:

Description	Value	Units
Operating Rate	2,700	kW
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	100	hr/yr

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	1.19	0.06
Filterable $PM_{2.5}$	1.19	0.06
Condensable PM	0.03	0.001
CO	20.83	1.04
SO_2	0.04	0.002
NO_X	38.10	1.90
VOC	38.10	1.90
Benzene	0.0197	0.0010
Toluene	0.0071	0.0004
Xylenes	0.0049	0.0002
Propylene	0.0707	0.004
Formaldehyde	0.0020	0.0001
Acetaldehyde	0.0006	0.00003
Acrolein	0.0002	0.00001
Naphthalene	0.0033	0.00016
Total PAH	0.0054	0.0003
CO_2		206
CH_4		0.0084
N_2O		0.0017
CO_{2e}		207

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.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 1

Inputs:

Description	Value	Units
Operating Rate	2,000	kW
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	100	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

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 1

Inputs:

Description	Value	Units
Operating Rate	2,000	kW
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	100	hr/yr

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.88	0.04
Filterable $PM_{2.5}$	0.88	0.04
Condensable PM	0.02	0.001
CO	15.43	0.77
SO_2	0.03	0.001
NO_X	28.22	1.41
VOC	28.22	1.41
Benzene	0.0146	0.0007
Toluene	0.0053	0.0003
Xylenes	0.0036	0.0002
Propylene	0.0523	0.003
Formaldehyde	0.0015	0.0001
Acetaldehyde	0.0005	0.00002
Acrolein	0.0001	0.00001
Naphthalene	0.0024	0.00012
Total PAH	0.0040	0.0002
CO_2		153
CH_4		0.0062
N_2O		0.0012
CO_{2e}		153

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.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 2

Inputs:

Description	Value	Units
Operating Rate	250	kW
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	100	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

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 2

Inputs:

Description	Value	Units
Operating Rate	250	kW
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	100	hr/yr

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.11	0.01
Filterable $PM_{2.5}$	0.11	0.01
Condensable PM	0.003	0.0001
CO	1.93	0.10
SO_2	0.004	0.0002
NO_X	2.20	0.11
VOC	2.20	0.11
Benzene	0.0022	0.0001
Toluene	0.0010	0.00005
Xylenes	0.0007	0.00003
Propylene	0.0061	0.0003
1,3-Butadiene	0.0001	0.000005
Formaldehyde	0.0028	0.0001
Acetaldehyde	0.0018	0.00009
Acrolein	0.0002	0.00001
Naphthalene	0.0002	0.00001
Total PAH	0.0004	0.00002
CO_2		19
CH_4		0.0008
N_2O		0.0002
CO_{2e}		19

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.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 3

Inputs:

Description	Value	Units
Operating Rate	2,000	kW
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	100	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

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 3

Inputs:

Description	Value	Units
Operating Rate	2,000	kW
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	100	hr/yr

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.88	0.04
Filterable $PM_{2.5}$	0.88	0.04
Condensable PM	0.02	0.001
CO	15.43	0.77
SO_2	0.03	0.001
NO_X	28.22	1.41
VOC	28.22	1.41
Benzene	0.0146	0.0007
Toluene	0.0053	0.0003
Xylenes	0.0036	0.0002
Propylene	0.0523	0.003
Formaldehyde	0.0015	0.0001
Acetaldehyde	0.0005	0.00002
Acrolein	0.0001	0.00001
Naphthalene	0.0024	0.00012
Total PAH	0.0040	0.0002
CO_2		153
CH_4		0.0062
N_2O		0.0012
CO_{2e}		153

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.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 4

Inputs:

Description	Value	Units
Operating Rate	250	kW
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	100	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

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Emissions Estimates for EAF Emergency Engine 4

Inputs:

Description	Value	Units
Operating Rate	250	kW
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	100	hr/yr

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.11	0.01
Filterable $PM_{2.5}$	0.11	0.01
Condensable PM	0.003	0.0001
CO	1.93	0.10
SO_2	0.004	0.0002
NO_X	2.20	0.11
VOC	2.20	0.11
Benzene	0.0022	0.0001
Toluene	0.0010	0.00005
Xylenes	0.0007	0.00003
Propylene	0.0061	0.0003
1,3-Butadiene	0.0001	0.000005
Formaldehyde	0.0028	0.0001
Acetaldehyde	0.0018	0.00009
Acrolein	0.0002	0.00001
Naphthalene	0.0002	0.00001
Total PAH	0.0004	0.00002
CO_2		19
CH_4		0.0008
N_2O		0.0002
CO_{2e}		19

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.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Insignificant Activity
Scrap Torching Emissions

Source:	Insignificant Activity - Torching
Description:	Scrap Torching

Inputs:

Description	Value	Units
Natural Gas Firing Rate(1)	0.61	MMBtu/hr
Natural Gas Heating Value	1,020	Btu/ft^3
Annual Fuel Usage(1)	30,000	MMBtu/yr

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
$PM/PM_{10}/PM_{2.5}$(3)	0.06	lb/hr
CO	0.082	lb/MMBtu
SO_2	0.0006	lb/MMBtu
NO_X	0.098	lb/MMBtu
VOC	0.0055	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	1.8	$lb/10^6 ft^3$
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	$lb/10^6 ft^3$

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	0.001	0.03
Filterable $PM_{2.5}$	0.001	0.03
Condensable PM	0.003	0.08
$PM/PM_{10}/PM_{2.5}$(3)	0.06	0.26
CO	0.05	1.24
SO_2	0.0004	0.01
NO_X	0.06	1.47
VOC	0.003	0.08

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	0.065	0.37
Total $PM_{2.5}$	0.065	0.37
CO	0.05	1.24
SO_2	0.0004	0.01
NO_X	0.06	1.47
VOC	0.003	0.08

Source:	Insignificant Activity - Torching
Description:	Scrap Torching

Notes:

(1) Natural Gas Firing Rate (torch size) and fuel usage based on April 3, 2018 email from AM/NS Calvert.

(2) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998). 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 $PM_{2.5}$.

(3) Additional $PM/PM_{10}/PM_{2.5}$ emissions have been included based on the 1996 Versar Report for Institute of Scrap Recycling Industries, Inc. "Title V Applicability Workbook" Table D-5.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Insignificant Activity
Slab Cutting Operation

Source:	Insignificant Activity - Slab Cutting Operation
Description:	Slab Cutting

Inputs:[1]

Description	Value	Units
Natural Gas Usage per Torch	0.15	m^3/hr
Natural Gas Usage per Torch	5.3	ft^3/hr
Daily Heats	32	
Slab Cuts per Heat	8	
Sample Cuts per Heat	1	
Torches per Slab Cut	2	
Torches per Sample Cut	4	
Slab/Sample Cut Time	3	min
Natural Gas Heating Value	1,020	Btu/ft^3
Combined Maximum Hourly Firing Rate for all Torches	0.032	MMBtu/hr
Operating Hours for Slab Cutting	12.8	hrs/day
Operating Hours for Sample Cutting	1.6	hrs/day
Annual Natural Gas Usage for Slab Cutting	50.49	MMBtu/yr
Annual Natural Gas Usage for Sample Cutting	12.62	MMBtu/yr
Total Annual Natural Gas Usage	63.11	MMBtu/yr

Emissions Summary:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Total PM_{10}	6.02E-02	2.63E-01
Total $PM_{2.5}$	6.02E-02	2.63E-01
CO	2.67E-03	2.60E-03
SO_2	1.95E-05	1.89E-05
NO_X	3.18E-03	3.09E-03
VOC	1.78E-04	1.74E-04

Emission Factors[2]

Pollutant	Value	Units
Filterable PM/PM_{10}	0.0019	lb/MMBtu
Filterable $PM_{2.5}$	0.0019	lb/MMBtu
Condensable PM	0.0056	lb/MMBtu
PM/PM_{10}/$PM_{2.5}$[(3)]	0.06	lb/hr
CO	0.082	lb/MMBtu
SO_2	0.0006	lb/MMBtu
NO_X	0.098	lb/MMBtu
VOC	0.0055	lb/MMBtu

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Insignificant Activity
Slab Cutting Operation

Source:	Insignificant Activity - Slab Cutting Operation
Description:	Slab Cutting

Emission Calculations:

Pollutant	Hourly Emissions	Annual Emissions
	lbs/hr	tpy
Filterable PM/PM_{10}	6.04E-05	5.88E-05
Filterable $PM_{2.5}$	6.04E-05	5.88E-05
Condensable PM	1.81E-04	1.76E-04
$PM/PM_{10}/PM_{2.5}$ (3)	0.06	2.63E-01
CO	2.67E-03	2.60E-03
SO_2	1.95E-05	1.89E-05
NO_X	3.18E-03	3.09E-03
VOC	1.78E-04	1.74E-04

Notes:

(1) Information provided by AM/NS Calvert in email dated October 3, 2019.

(2) Emission factors obtained from AP-42, Section 1.4, Natural Gas Combustion (July 1998). 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 $PM_{2.5}$.

(3) Additional $PM/PM_{10}/PM_{2.5}$ emissions have been included based on the 1996 Versar Report for Institute of Scrap Recycling Industries, Inc. "Title V Applicability Workbook" Table D-5.

AM/NS Calvert, LLC
Calvert, Alabama
PSD Permit Application for New Melt Shop
Insignificant Activity
Slag Drop Balling

Source:	Slag Drop Balling
Description:	Slag Drop Balling

Inputs:

Description	Value	Units
Annual Slag Drop Balling[3]	289,356	ton/yr

Emission Factors:

Pollutant	Emission Factor[1]	Units
Total PM	0.0012	lb/ton
Total PM_{10}	0.00054	lb/ton
Total $PM_{2.5}$	0.00010	lb/ton

Emission Calculations:

Pollutant	Annual Emissions[2] (tpy)
Total PM	0.17
Total PM_{10}	0.08
Total $PM_{2.5}$	0.01

Emissions Summary:

Pollutant	Annual Emissions (tpy)
Total PM	0.17
Total PM_{10}	0.08
Total $PM_{2.5}$	0.01

Notes:

(1) Emission factors obtained from AP-42, Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing (August 2004). Slag drop balling is considered to be primary crushing. As per footnote "n" to AP-42 Table 11.19.2-2, emissions from the slag drop balling are conservatively estimated using the emission factors for tertiary crushing.

(2) Annual emission rate calculated as shown below:

Annual emission rate [tpy] = ***(Total Slag Production [ton/yr] * 50% *Emission Factor [lb/ton] / (2,000 lb/ton)***

(3) Slag drop balling annual throughput assumed to be 50% of slag production.

APPENDIX C UPDATED ADEM AIR PERMIT APPLICATION FORMS

December 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-				

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1. **Name of firm or organization:** AM/NS 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 ____

Each of the New Melt Shops will consist of material handling activities, one (1) new EAF, one (1) twin LMF, one (1) Continuous Caster with spray vent, one (1) degassing operation, and ladle/tundish preheating activities. The exhausts from each of the individual melt shop sources (except for the continuous caster spray vent and degassing flare) will be combined prior to exhausting to the atmosphere through the respective New Melt Shop Baghouse. EAF 1 Operations will include preheating activities for the RH flare.

Each proposed new single shell EAF will be powered by a transformer and natural gas-fired oxygen/fuel burners. The EAFs will operate in a batch mode whereby the scrap steel and scrap substitutes will be charged, melted, and then tapped to a ladle. The temperature of the exhaust gas from the EAFs will approach 3,000°F.

Each of the new EAFs will be equipped with a direct evacuation control (DEC) system (e.g., direct shell evacuation system or DSES) and an overhead roof exhaust system consisting of a canopy hood. Emissions generated during melting, refining and charging will be captured and vented to a New Melt Shop Baghouse. The temperature of the exhaust stream from each of the New Melt Shop baghouses will be approximately 250°F.

Molten steel will be transferred by ladle to the twin LMF for steel refining. Each twin LMF will be equipped with a direct capture system that will capture and vent emissions to the corresponding New Melt Shop Baghouse.

During the steelmaking process, while molten steel is in the ladle and before it is poured, the steel (approximately 30%) must be degassed using a flare to remove unwanted gases that are dissolved in the liquid. Emissions from the degassing will be routed to a flare for control.

Ladles of molten steel will be transferred from the degassing operation or LMF by crane to the new Continuous Caster. The molten steel will drain into a vertical, water-cooled mold that is the desired width and thickness of the resulting slab. The continuous steel slab will exit at the bottom of the spray chamber where it will be torch cut at specified lengths into discreet slabs. Emissions generated during the casting process will be captured by the canopy hoods and vented to the corresponding New Melt Shop Baghouse. Steam generated from direct cooling will be captured by the caster steam exhaust system and released to the atmosphere through an emission stack on the roof.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Melt Shop – Electric Arc Furnace (EAF) 1 Operations

Make: TBD **Model:** TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 661,386

Manufactured date: TBD **Proposed installation date:** TBD

Original installation date (if existing):

Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

Peak production season (if any): None

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
Scrap Steel and Scrap Substitutes	661,386 (331 tons per hour)	661,386 (331 tons per hour)	1,929,043

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 168 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Slabs	1,929,043 (1,750,000 metric tpy)	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

A scrap management plan will be implemented for the minimizing the amount of oils, paint, grease, and plastic in the scrap steel.

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
EAF 1	406.746	3,446.704	200.13	48.9	21.33	75.56	1,392,300 (dscfm)	245

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
EAF 1	Filterable PM/PM_{10}	21.48	62.65	BACT	0.0018	gr/dscf
EAF 1	Filterable $PM_{2.5}$	21.48	62.65	BACT	0.0018	gr/dscf
EAF 1	Condensable PM	40.58	118.35	BACT	0.0034	gr/dscf
EAF 1	CO	727.52	2,121.95	BACT	2.2	lb/ton
EAF 1	SO_2	115.74	337.58	BACT	0.35	lb/ton
EAF 1	NO_x	115.74	337.58	BACT	0.35	lb/ton
EAF 1	VOC	42.99	125.39	BACT	0.13	lb/ton
EAF 1	Pb	0.66	1.93	BACT	0.002	lb/ton
EAF 1	Total HAP	0.99	3.16	AP-42	N/A	
EAF 1	CO_2e	-	826,888.87	40 CFR 98	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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.)
Slag	TBD	25,000 (5 piles)	Wet Suppression
Raw Materials	TBD	4,676,841 (piles)	Wet Suppression

Name of person preparing application: Vikram Kashyap

Signature: [signature] Date: November 18, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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

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1. **Name of firm or organization:** AM/NS 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 ____

   Each of the New Melt Shops will consist of material handling activities, one (1) new EAF, one (1) twin LMF, one (1) Continuous Caster with spray vent, one (1) degassing operation, and ladle/tundish preheating activities. The exhausts from each of the individual melt shop sources (except for the continuous caster spray vent and degassing flare) will be combined prior to exhausting to the atmosphere through the respective New Melt Shop Baghouse.

   Each proposed new single shell EAF will be powered by a transformer and natural gas-fired oxygen/fuel burners. The EAFs will operate in a batch mode whereby the scrap steel and scrap substitutes will be charged, melted, and then tapped to a ladle. The temperature of the exhaust gas from the EAFs will approach 3,000°F.

   Each of the new EAFs will be equipped with a direct evacuation control (DEC) system (e.g., direct shell evacuation system or DSES) and an overhead roof exhaust system consisting of a canopy hood. Emissions generated during melting, refining and charging will be captured and vented to a New Melt Shop Baghouse. The temperature of the exhaust stream from each of the New Melt Shop baghouses will be approximately 250°F.

   Molten steel will be transferred by ladle to the twin LMF for steel refining. Each twin LMF will be equipped with a direct capture system that will capture and vent emissions to the corresponding New Melt Shop Baghouse.

   During the steelmaking process, while molten steel is in the ladle and before it is poured, the steel (approximately 30%) must be degassed using a flare to remove unwanted gases that are dissolved in the liquid. Emissions from the degassing will be routed to a flare for control.

   Ladles of molten steel will be transferred from the degassing operation or LMF by crane to the new Continuous Caster. The molten steel will drain into a vertical, water-cooled mold that is the desired width and thickness of the resulting slab. The continuous steel slab will exit at the bottom of the spray chamber where it will be torch cut at specified lengths into discreet slabs. Emissions generated during the casting process will be captured by the canopy hoods and vented to the corresponding New Melt Shop Baghouse. Steam generated from direct cooling will be captured by the caster steam exhaust system and released to the atmosphere through an emission stack on the roof.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Melt Shop – Electric Arc Furnace (EAF) 2 Operations

Make: TBD **Model:** TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 661,386

Manufactured date: TBD **Proposed installation date:** TBD

Original installation date (if existing): ________

Reconstruction or Modification date (if applicable): ________

4. Normal operating schedule:

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

Peak production season (if any): None

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
Scrap Steel and Scrap Substitutes	661,386 (331 tons per hour)	661,386 (331 tons per hour)	1,929,043

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 135 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Slabs	1,929,043 (1,750,000 metric tpy)	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

A scrap management plan will be implemented for the minimizing the amount of oils, paint, grease, and plastic in the scrap steel.

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
EAF 2	406.755	3,446.674	200.13	48.9	21.33	75.56	1,392,300 (dscfm)	245

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
EAF 2	Filterable PM/PM_{10}	21.48	62.65	BACT	0.0018	gr/dscf
EAF 2	Filterable $PM_{2.5}$	21.48	62.65	BACT	0.0018	gr/dscf
EAF 2	Condensable PM	40.58	118.35	BACT	0.0034	gr/dscf
EAF 2	CO	727.52	2,121.95	BACT	2.2	lb/ton
EAF 2	SO_2	115.74	337.58	BACT	0.35	lb/ton
EAF 2	NO_x	115.74	337.58	BACT	0.35	lb/ton
EAF 2	VOC	42.99	125.39	BACT	0.13	lb/ton
EAF 2	Pb	0.66	1.93	BACT	0.002	lb/ton
EAF 2	Total HAP	0.93	2.90	AP-42	N/A	
EAF 2	CO_2e	-	810,412.77	40 CFR 98	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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.)
Slag	TBD	25,000 (5 piles)	Wet Suppression
Raw Materials	TBD	4,676,841 (piles)	Wet Suppression

Name of person preparing application: Vikram Kashyap

Signature: VKashyap Date: November 18, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-				

Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   The primary purpose of the vacuum tank degassers is to decarburize, desulfurize, and subsequently remove nitrogen. Sulfur is retained in the slag and not emitted as SO_2. Process gasses from each of the degassing operations will be exhausted to a vent stack and controlled by a flare. The flare will have a natural gas-fired pilot with a natural gas usage rate of 5,100 scf/hr. The RH degassing process design Includes an additional oxy fuel-fired burner/lance for preheating with a capacity of 10.35 MMBtu/hr. The degassing operations utilize oxygen blowing to produce ultra-low carbon grades of steel. The oxygen blowing provides forced decarburization and chemical reheating, as required.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Melt Shop – Degassing Operation 1

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 660,000

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Carbon Steel Degassing	330 tons per hour	330 tons per hour	Combined limit for Degassing Operations 1 & 2 3,858,085 tpy (3,750,000 metric tons)

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 15.55 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Degassing	Combined limit for Degassing Operations 1 & 2 3,858,085 tpy (3,750,000 metric tons)	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
DF 1	406.913	3,446.932	165.3	48.9	1.31	65.62	5,325.33	1,831.73

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DF 1	Filterable PM/PM_{10}	0.24	1.20	BACT	0.24	lb/hr
DF 1	Filterable $PM_{2.5}$	0.24	1.20	BACT	0.24	lb/hr
DF 1	Condensable PM	0.09	0.47	BACT	5.70	lb/10^6scf
DF 1	CO	25.92	126.21	BACT	25.92	lb/hr
DF 1	SO_2	0.009	0.05	BACT	0.60	lb/10^6scf
DF 1	NO_x	1.52	8.18	BACT	100	lb/10^6scf
DF 1	VOC	0.08	0.45	BACT	5.50	lb/10^6scf
DF 1	Pb	7.62×10^{-6}	4.09×10^{-5}	BACT	0.0005	lb/10^6scf
DF 1	Total HAP	0.03	0.15	AP-42	N/A	
DF 1	CO_2e	-	12,033.51	40 CFR 98 & Combusted CO	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☐ Yes ☒ No

15. 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: Vikram Kashyap

Signature: [signature] Date: November 18, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   The primary purpose of the vacuum tank degassers is to decarburize, desulfurize, and subsequently remove nitrogen. Sulfur is retained in the slag and not emitted as SO_2. Process gasses from each of the degassing operations will be exhausted to a vent stack and controlled by a flare. The flare will have a natural gas-fired pilot with a natural gas usage rate of 5,100 scf/hr.

   The degassing operations utilize oxygen blowing to produce ultra-low carbon grades of steel. The oxygen blowing provides forced decarburization and chemical reheating, as required.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Melt Shop –Degassing Operation 2

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 660,000

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Carbon Steel Degassing	330 tons per hour	330 tons per hour	Combined limit for Degassing Operations 1 & 2 3,858,085 tpy (3,750,000 metric tons)

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 5.2 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Degassing	Combined limit for Degassing Operations 1 & 2 3,858,085 tpy (3,750,000 metric tons)	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
VTD 2	406.748	3,446.959	179.4	48.9	1.0	65.62	3,092.12	1,831.73

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
VTD 2	Filterable PM/PM_{10}	0.22	0.23	BACT	0.22	lb/hr
VTD 2	Filterable $PM_{2.5}$	0.22	0.23	BACT	0.22	lb/hr
VTD 2	Condensable PM	0.03	0.03	BACT	5.70	lb/10^6scf
VTD 2	CO	25.07	25.17	BACT	25.07	lb/hr
VTD 2	SO_2	0.003	0.003	BACT	0.60	lb/10^6scf
VTD 2	NO_x	0.51	0.57	BACT	100	lb/10^6scf
VTD 2	VOC	0.03	0.03	BACT	5.50	lb/10^6scf
VTD 2	Pb	$2.55x10^{-6}$	$2.83x10^{-6}$	BACT	0.0005	lb/10^6scf
VTD 2	Total HAP	0.01	0.01	AP-42	N/A	
VTD 2	CO_2e	-	1,145.00	40 CFR 98 & Combusted CO	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☐ Yes ☒ No

15. 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: Vikram Kashyap

Signature: [signature] Date: November 18, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-				

Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Baghouse Dust Storage Silo 1

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 9,535 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Baghouse Dust	9,535 ft^3	9,535 ft^3	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

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)						

7. Products of process or unit:

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

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
BHD Silo 1	406.776	3,446.711	60	48.9	3.39	1.66	895	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
BHD Silo 1	Filterable PM/PM_{10}	0.038	0.17	BACT	0.005	gr/dscf
BHD Silo 1	Filterable $PM_{2.5}$	0.038	0.17	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: December 18, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-					

Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Baghouse Dust Storage Silo 2

   Make: TBD　　Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 9,535 (ft^3) capacity

   Manufactured date: TBD　　Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Baghouse Dust	9,535 ft^3	9,535 ft^3	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

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)						

7. Products of process or unit:

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

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
BHD Silo 2	406.783	3,446.718	60	48.9	3.39	1.66	895	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
BHD Silo 2	Filterable PM/PM_{10}	0.038	0.17	BACT	0.005	gr/dscf
BHD Silo 2	Filterable $PM_{2.5}$	0.038	0.17	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: December 18, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

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

Permit Number (ADEM Use Only)

1. Facility Name: **AM/NS Calvert, LLC** **Location:** **Calvert, Alabama**

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. an 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, please describe ____

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2021

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's Name: TBD B. Model Number: TBD C. Model Year: 2020/2021

D. Facility's Identification Number or Description: EAF EGEN1 E. Serial Number: TBD

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2021 B. Date Manufactured: 2020/2021 C. Date Modified/Reconstructed: ____

D. For a used engine, approximate date engine was first placed into service at any location: ____

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 2,000 kW) ☐ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stan ☐ Other, please describe: ____

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: ____ B. Days Per Week: ____ C. Weeks per Year: ____

D. Peak Season (if any): ____

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 2,680 B. Maximum Engine Power (kWm): 2,000 C. Maximum 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: N/A

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): < 30 L/cyl

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	**Diesel**	**15 ppm**		
Secondary/Backup				

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

A. Height above grade (feet): 7.9 B. Inside Diameter at Exit (feet): 0.67 C. Exhaust Gas Volume (ACFM): 15,295

D. Base Elevation (feet): 48.9 E. Exhaust Gas Temperature°F): 752 F. Are sampling ports available? ☐ Yes ☒ No

G. UTM Coordinate (E-W) (km): 406.796 H. UTM Coordinate (N-S) (km): 3,447.056

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM/PM_{10}	**0.88**	**0.04**			**40 CFR 60 Subpart IIII**	
Filterable $PM_{2.5}$	**0.88**	**0.04**			**Assumed equal to PM_{10}**	
Condensable PM	**0.02**	**0.001**			**EPA PM Calculator**	
SO_2	**0.03**	**0.001**			**15 ppm sulfur content of fuel**	
NO_x	**28.22**	**1.41**			**40 CFR 60 Subpart IIII**	
CO	**15.43**	**0.77**			**40 CFR 60 Subpart IIII**	
VOC	**28.22**	**1.41**			**40 CFR 60 Subpart IIII**	
Formaldehyde	**0.0015**	**0.0001**			**AP-42**	
Total HAP	**0.084**	**0.0042**			**AP-42**	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE Other:
☐ Other:____________________
☐ Other: ____________________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
PM Emission Rate	*0.20*	*g/kW-hr*	*NSPS IIII*	*0.20*
NMHC + NOx Emission Rate	*6.4*	*g/kW-hr*	*NSPS IIII*	*6.4*
CO Emission Rate	*3.5*	*g/kW-hr*	*NSPS IIII*	*3.5*

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, 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 ☐ No ☒ Yes (If yes, attach a copy of the certification)*

***Engine purchased will be certified to meet the applicable Tier standards.**

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

***Engine will be equipped with non-resettable hour meter.**

13. Pollution Control Information:

A. Device/Technology Type(s):

- ☒ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NO_x Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction (SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Other: ______
- ☐ Other: ______
- ☐ Other: ______

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? ☒ Yes ☐ No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Vikram Kashyap Company/Affiliation: ERM

Signature: [signature] Date: November 20, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

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

Permit Number (ADEM Use Only)

1. Facility Name: **AM/NS Calvert, LLC** **Location:** **Calvert, Alabama**

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. an 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, please describe ______

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2021

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's Name: TBD B. Model Number: TBD C. Model Year: 2020/2021

D. Facility's Identification Number or Description: EAF EGEN 2 E. Serial Number: TBD

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2021 B. Date Manufactured: 2020/2021 C. Date Modified/Reconstructed: ______

D. For a used engine, approximate date engine was first placed into service at any location: ______

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 250 kW) ☐ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stan ☐ Other, please describe: ______

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: ______ B. Days Per Week: ______ C. Weeks per Year: ______

D. Peak Season (if any): ______

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 335 B. Maximum Engine Power (kWm): 250 C. Maximum 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: N/A

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): < 30 L/cyl

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	**Diesel**	**15 ppm**		
Secondary/Backup				

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

A. Height above grade (feet): 7.9 B. Inside Diameter at Exit (feet): 0.42 C. Exhaust Gas Volume (ACFM): 2,246

D. Base Elevation (feet): 48.9 E. Exhaust Gas Temperature°F): 852 F. Are sampling ports available? ☐ Yes ☒ No

G. UTM Coordinate (E-W) (km): 406.794 H. UTM Coordinate (N-S) (km): 3,447.053

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM/PM_{10}	**0.11**	**0.01**			**40 CFR 60 Subpart IIII**	
Filterable $PM_{2.5}$	**0.11**	**0.01**			**Assumed equal to PM_{10}**	
Condensable PM	**0.003**	**0.0001**			**EPA PM Calculator**	
SO_2	**0.004**	**0.0002**			**15 ppm sulfur content of fuel**	
NO_x	**2.20**	**0.11**			**40 CFR 60 Subpart IIII**	
CO	**1.93**	**0.10**			**40 CFR 60 Subpart IIII**	
VOC	**2.20**	**0.11**			**40 CFR 60 Subpart IIII**	
Formaldehyde	**0.0028**	**0.0001**			**AP-42**	
Total HAP	**0.015**	**0.0008**			**AP-42**	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines ☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE

☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines ☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE

☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE Other:

☐ Other:__________ ☐ Other: __________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
PM Emission Rate	*0.20*	*g/kW-hr*	*NSPS IIII*	*0.20*
NMHC + NOx Emission Rate	*4.0*	*g/kW-hr*	*NSPS IIII*	*4.0*
CO Emission Rate	*3.5*	*g/kW-hr*	*NSPS IIII*	*3.5*

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, 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 ☐ No ☒ Yes (If yes, attach a copy of the certification)*

***Engine purchased will be certified to meet the applicable Tier standards.**

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

***Engine will be equipped with non-resettable hour meter.**

13. Pollution Control Information:

A. Device/Technology Type(s):

- ☒ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NO_X Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction (SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Other: ____________________
- ☐ Other: ____________________
- ☐ Other: ____________________

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? ☒ Yes ☐ No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Vikram Kashyap Company/Affiliation: ERM

Signature: [signature] Date: November 20, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

				-					-				

Permit Number (ADEM Use Only)

1. Facility Name: **AM/NS Calvert, LLC** **Location:** **Calvert, Alabama**

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. an 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, please describe ______

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2021

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's Name: TBD B. Model Number: TBD C. Model Year: 2020/2021

D. Facility's Identification Number or Description: EAF EGEN3 E. Serial Number: TBD

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2021 B. Date Manufactured: 2020/2021 C. Date Modified/Reconstructed: ______

D. For a used engine, approximate date engine was first placed into service at any location: ______

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 2,000 kW) ☐ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stan ☐ Other, please describe: ______

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: ______ B. Days Per Week: ______ C. Weeks per Year: ______

D. Peak Season (if any): ______

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 2,680 B. Maximum Engine Power (kWm): 2,000 C. Maximum 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: N/A

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): < 30 L/cyl

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	**Diesel**	**15 ppm**		
Secondary/Backup				

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

A. Height above grade (feet): 7.9 B. Inside Diameter at Exit (feet): 0.67 C. Exhaust Gas Volume (ACFM): 15,295

D. Base Elevation (feet): 48.9 E. Exhaust Gas Temperature°F): 752 F. Are sampling ports available? ☐ Yes ☒ No

G. UTM Coordinate (E-W) (km): 406.771 H. UTM Coordinate (N-S) (km): 3,447.031

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM/PM_{10}	**0.88**	**0.04**			**40 CFR 60 Subpart IIII**	
Filterable $PM_{2.5}$	**0.88**	**0.04**			**Assumed equal to PM_{10}**	
Condensable PM	**0.02**	**0.001**			**EPA PM Calculator**	
SO_2	**0.03**	**0.001**			**15 ppm sulfur content of fuel**	
NO_x	**28.22**	**1.41**			**40 CFR 60 Subpart IIII**	
CO	**15.43**	**0.77**			**40 CFR 60 Subpart IIII**	
VOC	**28.22**	**1.41**			**40 CFR 60 Subpart IIII**	
Formaldehyde	**0.0015**	**0.0001**			**AP-42**	
Total HAP	**0.084**	**0.0042**			**AP-42**	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE Other:
☐ Other:__________
☐ Other: __________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
PM Emission Rate	*0.20*	*g/kW-hr*	*NSPS IIII*	*0.20*
NMHC + NOx Emission Rate	*6.4*	*g/kW-hr*	*NSPS IIII*	*6.4*
CO Emission Rate	*3.5*	*g/kW-hr*	*NSPS IIII*	*3.5*

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, 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 man ufacturer pursuant to the applicable regulation to meet the applicable emission standards? ☐ N/A ☐ No ☒ Yes (If yes, attach a copy of the certification)*

***Engine purchased will be certified to meet the applicable Tier standards.**

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

***Engine will be equipped with non-resettable hour meter.**

13. Pollution Control Information:

A. Device/Technology Type(s):

- ☒ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NO_X Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction (SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Other: ____
- ☐ Other: ____
- ☐ Other: ____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? ☒ Yes ☐ No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Vikram Kashyap Company/Affiliation: ERM

Signature: [signature] Date: November 20, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

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

Permit Number (ADEM Use Only)

1. Facility Name: **AM/NS Calvert, LLC** **Location:** **Calvert, Alabama**

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. an 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, please describe ______

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2021

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's Name: TBD B. Model Number: TBD C. Model Year: 2020/2021

D. Facility's Identification Number or Description: EAF EGEN 4 E. Serial Number: TBD

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2021 B. Date Manufactured: 2020/2021 C. Date Modified/Reconstructed: ______

D. For a used engine, approximate date engine was first placed into service at any location: ______

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 250 kW) ☐ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stan ☐ Other, please describe: ______

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: ______ B. Days Per Week: ______ C. Weeks per Year: ______

D. Peak Season (if any): ______

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 335 B. Maximum Engine Power (kWm): 250 C. Maximum 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: N/A

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): < 30 L/cyl

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	**Diesel**	**15 ppm**		
Secondary/Backup				

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

A. Height above grade (feet): 7.9 B. Inside Diameter at Exit (feet): 0.42 C. Exhaust Gas Volume (ACFM): 2,246

D. Base Elevation (feet): 48.9 E. Exhaust Gas Temperature°F): 852 F. Are sampling ports available? ☐ Yes ☒ No

G. UTM Coordinate (E-W) (km): 406.768 H. UTM Coordinate (N-S) (km): 3,447.027

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM/PM_{10}	**0.11**	**0.01**			**40 CFR 60 Subpart IIII**	
Filterable $PM_{2.5}$	**0.11**	**0.01**			**Assumed equal to PM_{10}**	
Condensable PM	**0.003**	**0.0001**			**EPA PM Calculator**	
SO_2	**0.004**	**0.0002**			**15 ppm sulfur content of fuel**	
NO_x	**2.20**	**0.11**			**40 CFR 60 Subpart IIII**	
CO	**1.93**	**0.10**			**40 CFR 60 Subpart IIII**	
VOC	**2.20**	**0.11**			**40 CFR 60 Subpart IIII**	
Formaldehyde	**0.0028**	**0.0001**			**AP-42**	
Total HAP	**0.015**	**0.0008**			**AP-42**	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE Other:
☐ Other:____________________
☐ Other: ____________________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
PM Emission Rate	*0.20*	*g/kW-hr*	*NSPS IIII*	*0.20*
NMHC + NOx Emission Rate	*4.0*	*g/kW-hr*	*NSPS IIII*	*4.0*
CO Emission Rate	*3.5*	*g/kW-hr*	*NSPS IIII*	*3.5*

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, 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 ☐ No ☒ Yes (If yes, attach a copy of the certification)*

***Engine purchased will be certified to meet the applicable Tier standards.**

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

***Engine will be equipped with non-resettable hour meter.**

13. Pollution Control Information:

A. Device/Technology Type(s):

- ☒ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NO_X Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction (SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Other: ______________________
- ☐ Other: ______________________
- ☐ Other: ______________________

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? ☒ Yes ☐ No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Vikram Kashyap   Company/Affiliation: ERM

Signature: [signature]   Date: November 20, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

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

Permit Number (ADEM Use Only)

1. Facility Name: AM/NS Calvert, LLC **Location:** Calvert, Alabama

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. an 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, please describe ______

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2021

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's Name: TBD B. Model Number: TBD C. Model Year: 2020/2021

D. Facility's Identification Number or Description: CWC EGEN1 E. Serial Number: TBD

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2021 B. Date Manufactured: 2020/2021 C. Date Modified/Reconstructed: ______

D. For a used engine, approximate date engine was first placed into service at any location: ______

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 2,700 kW) ☐ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stan ☐ Other, please describe: ______

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: ______ B. Days Per Week: ______ C. Weeks per Year: ______

D. Peak Season (if any): ______

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 3,618 B. Maximum Engine Power (kWm): 2,700 C. Maximum 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: N/A

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): < 30 L/cyl

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	**Diesel**	**15 ppm**		
Secondary/Backup				

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

A. Height above grade (feet): 7.9 B. Inside Diameter at Exit (feet): 1 C. Exhaust Gas Volume (ACFM): 21,725

D. Base Elevation (feet): 48.9 E. Exhaust Gas Temperature°F): 897 F. Are sampling ports available? ☐ Yes ☒ No

G. UTM Coordinate (E-W) (km): 406.632 H. UTM Coordinate (N-S) (km): 3,446.789

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM/PM_{10}	**1.19**	**0.06**			**40 CFR 60 Subpart IIII**	
Filterable $PM_{2.5}$	**1.19**	**0.06**			**Assumed equal to PM_{10}**	
Condensable PM	**0.03**	**0.001**			**EPA PM Calculator**	
SO_2	**0.04**	**0.002**			**15 ppm sulfur content of fuel**	
NO_x	**38.10**	**1.90**			**40 CFR 60 Subpart IIII**	
CO	**20.83**	**1.04**			**40 CFR 60 Subpart IIII**	
VOC	**38.10**	**1.90**			**40 CFR 60 Subpart IIII**	
Formaldehyde	**0.0020**	**0.0001**			**AP-42**	
Total HAP	**0.11**	**0.0057**			**AP-42**	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.
[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE Other:
☐ Other:____________________
☐ Other: ____________________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
PM Emission Rate	*0.20*	*g/kW-hr*	*NSPS IIII*	*0.20*
NMHC + NOx Emission Rate	*6.4*	*g/kW-hr*	*NSPS IIII*	*6.4*
CO Emission Rate	*3.5*	*g/kW-hr*	*NSPS IIII*	*3.5*

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, 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 man ufacturer pursuant to the applicable regulation to meet the applicable emission standards? ☐ N/A ☐ No ☒ Yes (If yes, attach a copy of the certification)*

***Engine purchased will be certified to meet the applicable Tier standards.**

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

***Engine will be equipped with non-resettable hour meter.**

13. Pollution Control Information:

A. Device/Technology Type(s):

☒ No Controls
☐ Air-to-Fuel Ratio Controller
☐ Water or Steam Injection
☐ Low NO_x Burners
☐ Oxidation Catalyst
☐ Selective Non-catalytic Reduction (SNCR)
☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
☐ Selective Catalytic Reduction (SCR)
☐ Other: ______
☐ Other: ______
☐ Other: ______

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? ☒ Yes ☐ No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Vikram Kashyap Company/Affiliation: ERM

Signature: [signature] Date: November 20, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

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

Permit Number (ADEM Use Only)

1. Facility Name: **AM/NS Calvert, LLC** **Location:** **Calvert, Alabama**

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. an 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, please describe ______

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2021

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's Name: TBD B. Model Number: TBD C. Model Year: 2020/2021

D. Facility's Identification Number or Description: CWC EGEN2 E. Serial Number: TBD

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2021 B. Date Manufactured: 2020/2021 C. Date Modified/Reconstructed: ______

D. For a used engine, approximate date engine was first placed into service at any location: ______

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 2,700 kW) ☐ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stan ☐ Other, please describe: ______

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: ______ B. Days Per Week: ______ C. Weeks per Year: ______

D. Peak Season (if any): ______

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 3,618 B. Maximum Engine Power (kWm): 2,700 C. Maximum 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: N/A

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): < 30 L/cyl

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	**Diesel**	**15 ppm**		
Secondary/Backup				

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

A. Height above grade (feet): 7.9 B. Inside Diameter at Exit (feet): 1 C. Exhaust Gas Volume (ACFM): 21,725

D. Base Elevation (feet): 48.9 E. Exhaust Gas Temperature°F): 897 F. Are sampling ports available? ☐ Yes ☒ No

G. UTM Coordinate (E-W) (km): 406.641 H. UTM Coordinate (N-S) (km): 3,446.780

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM/PM_{10}	**1.19**	**0.06**			**40 CFR 60 Subpart IIII**	
Filterable $PM_{2.5}$	**1.19**	**0.06**			**Assumed equal to PM_{10}**	
Condensable PM	**0.03**	**0.001**			**EPA PM Calculator**	
SO_2	**0.04**	**0.002**			**15 ppm sulfur content of fuel**	
NO_x	**38.10**	**1.90**			**40 CFR 60 Subpart IIII**	
CO	**20.83**	**1.04**			**40 CFR 60 Subpart IIII**	
VOC	**38.10**	**1.90**			**40 CFR 60 Subpart IIII**	
Formaldehyde	**0.0020**	**0.0001**			**AP-42**	
Total HAP	**0.11**	**0.0057**			**AP-42**	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines

☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE

☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines

☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE

☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines

☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE Other:

☐Other:______________________________

☐Other: ______________________________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
PM Emission Rate	*0.20*	*g/kW-hr*	*NSPS IIII*	*0.20*
NMHC + NOx Emission Rate	*6.4*	*g/kW-hr*	*NSPS IIII*	*6.4*
CO Emission Rate	*3.5*	*g/kW-hr*	*NSPS IIII*	*3.5*

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, 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 man ufacturer pursuant to the applicable regulation to meet the applicable emission standards? ☐ N/A ☐ No ☒ Yes (If yes, attach a copy of the certification)*

***Engine purchased will be certified to meet the applicable Tier standards.**

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

***Engine will be equipped with non-resettable hour meter.**

13. Pollution Control Information:

A. Device/Technology Type(s):

- ☒ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NO_X Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction (SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Other: ______
- ☐ Other: ______
- ☐ Other: ______

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? ☒ Yes ☐ No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Vikram Kashyap Company/Affiliation: ERM

Signature: [signature] Date: November 20, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

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

Permit Number (ADEM Use Only)

1. Facility Name: **AM/NS Calvert, LLC** **Location:** **Calvert, Alabama**

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. an 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, please describe ______

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 2021

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's Name: TBD B. Model Number: TBD C. Model Year: 2020/2021

D. Facility's Identification Number or Description: CWC EGEN3 E. Serial Number: TBD

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: 2021 B. Date Manufactured: 2020/2021 C. Date Modified/Reconstructed: ______

D. For a used engine, approximate date engine was first placed into service at any location: ______

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 2,700 kW) ☐ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stan ☐ Other, please describe: ______

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below:

☐ Limited Use (<100 hr/yr) A. Hours Per Day: ______ B. Days Per Week: ______ C. Weeks per Year: ______

D. Peak Season (if any): ______

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 3,618 B. Maximum Engine Power (kWm): 2,700 C. Maximum 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: N/A

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): < 30 L/cyl

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	**Diesel**	**15 ppm**		
Secondary/Backup				

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

A. Height above grade (feet): 7.9 B. Inside Diameter at Exit (feet): 1 C. Exhaust Gas Volume (ACFM): 21,725

D. Base Elevation (feet): 48.9 E. Exhaust Gas Temperature°F): 897 F. Are sampling ports available? ☐ Yes ☒ No

G. UTM Coordinate (E-W) (km): 406.650 H. UTM Coordinate (N-S) (km): 3,446.771

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM/PM_{10}	**1.19**	**0.06**			**40 CFR 60 Subpart IIII**	
Filterable $PM_{2.5}$	**1.19**	**0.06**			**Assumed equal to PM_{10}**	
Condensable PM	**0.03**	**0.001**			**EPA PM Calculator**	
SO_2	**0.04**	**0.002**			**15 ppm sulfur content of fuel**	
NO_x	**38.10**	**1.90**			**40 CFR 60 Subpart IIII**	
CO	**20.83**	**1.04**			**40 CFR 60 Subpart IIII**	
VOC	**38.10**	**1.90**			**40 CFR 60 Subpart IIII**	
Formaldehyde	**0.0020**	**0.0001**			**AP-42**	
Total HAP	**0.11**	**0.0057**			**AP-42**	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE Other:
☐ Other:____________________
☐ Other: ____________________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
PM Emission Rate	*0.20*	*g/kW-hr*	*NSPS IIII*	*0.20*
NMHC + NOx Emission Rate	*6.4*	*g/kW-hr*	*NSPS IIII*	*6.4*
CO Emission Rate	*3.5*	*g/kW-hr*	*NSPS IIII*	*3.5*

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, 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 ☐ No ☒ Yes (If yes, attach a copy of the certification)*

***Engine purchased will be certified to meet the applicable Tier standards.**

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

***Engine will be equipped with non-resettable hour meter.**

13. Pollution Control Information:

A. Device/Technology Type(s):

- ☒ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☐ Low NO_X Burners
- ☐ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction (SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☐ Selective Catalytic Reduction (SCR)
- ☐ Other: ______
- ☐ Other: ______
- ☐ Other: ______

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? ☒ Yes ☐ No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Vikram Kashyap Company/Affiliation: ERM

Signature: V Kashyap Date: November 20, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Flare

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Degassing Operation 1

5. Emission parameters:

	Pollutants Removed		
	CO		
Mass emission rate (#/hr)			
Uncontrolled	492.80		
Designed	24.64		
Manufacturer's guaranteed	0.074667 lb/ton		
Mass emission rate (units of the Standard)			
Required by regulation	N/A		
Manufacturer's guaranteed	0.074667 lb/ton		
Removal efficiency (%)			
Designed	95		
Manufacturer's guaranteed	95		

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	TBD		5,325.33
Temperature (ºF)	TBD		1,831.73
Velocity (ft/sec)	TBD		65.62
Percent moisture	TBD		TBD

Pressure drop across device: N/A (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.913	(km)
UTM Coordinates (N-S)	3,446.932	(km)
Height above grade	165.26	(feet)
Inside diameter at exit (if opening is round) ...	1.31	(feet)
Inside area at exit (if opening is not round)		(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height..................................	213	(feet)

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.

See attached PFD

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.)

During degassing operations the pilot flame shall be present at all times. The flame will be monitored with a thermocouple and, upon loss of the pilot, the pilot will reignite and if re-ignition fails and alarm will be generated. The flare shall operate at all times when emissions may be vented to the flare.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date November 18, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Flare

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Degassing Operation 2

5. Emission parameters:

	Pollutants Removed		
	CO		
Mass emission rate (#/hr)			
Uncontrolled	492.80		
Designed	24.64		
Manufacturer's guaranteed	0.074667 lb/ton		
Mass emission rate (units of the Standard)			
Required by regulation	N/A		
Manufacturer's guaranteed	0.074667 lb/ton		
Removal efficiency (%)			
Designed	95		
Manufacturer's guaranteed	95		

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)	TBD		3,092.12
Temperature (ºF)	TBD		1,831.73
Velocity (ft/sec)	TBD		65.62
Percent moisture	TBD		TBD

Pressure drop across device: N/A (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)	406.748	(km)
UTM Coordinates (N-S)	3,446.959	(km)
Height above grade	179.43	(feet)
Inside diameter at exit (if opening is round) ...	1.0	(feet)
Inside area at exit (if opening is not round)		(sq. feet)
Base Elevation....................................	48.9	(feet)
GEP Stack Height................................	213	(feet)

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.

See attached PFD

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.)

During degassing operations the pilot flame shall be present at all times. The flame will be monitored with a thermocouple and, upon loss of the pilot, the pilot will reignite and if re-ignition fails and alarm will be generated. The flare shall operate at all times when emissions may be vented to the flare.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date November 18, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer: TBD   Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Baghouse Dust Silo 1

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.038	0.038	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		895
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)	406.776	(km)
UTM Coordinates (N-S)	3,446.711	(km)
Height above grade	60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD			
Composition	Metal Dust			
Is waste hazardous?	TBD			
Method of disposal	Offsite			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Vikram Kashyap

Signature [signature]

Date December 18, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Baghouse Dust Silo 2

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.038	0.038	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		895
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)	406.783	(km)
UTM Coordinates (N-S)	3,446.718	(km)
Height above grade	60	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD			
Composition	Metal Dust			
Is waste hazardous?	TBD			
Method of disposal	Offsite			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Vikram Kashyap

Signature [signature] Date December 18, 2020

APPENDIX D UPDATED BACT ANALYSIS

December 2020

AM/NS Calvert, LLC

Updated Appendix D Best Achievable Control Technology (BACT) Analysis

December 2020

Project No.: 0426226

The business of sustainability

ERM

Signature page

December 2020

AM/NS Calvert, LLC

Updated Appendix D Best Achievable Control Technology (BACT) Analysis

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Contents

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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, SO_2, CO, VOC, lead, 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) Electric Arc Furnaces (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations) and associated baghouses;
- One (1) Contact Cooling Tower for Casting (Cooling Tower will be sized for casting from both EAFs);
- Two (2) Caster Steam Exhausts (Direct contact cooling water for Casting);
- Slag Handling Operations;
- Storage Piles (scrap and raw material handling operations) and Material Transfer;
- Two (2) Degassing Operations controlled by Flares (1 Vacuum Tank Degassing (VTD) Flare and 1 Ruhrstahl-Heraeus (RH) Flare, the Degassing Operation for the RH flare will have associated preheating activities). One (1) EAF will have a VTD operation and the other EAF will have the RH operation;
- 24 silos for the storage of alloys;
- Ten (10) silos for the storage of lime, dolomite and bauxite;
- Eight (8) silos for the storage of direct reduced iron (DRI);
- Five (5) silos for the storage of flux injection materials;
- Four (4) silos for the storage of hot briquetted iron (HBI);
- Two (2) silos for the storage of baghouse dust;
- Scarfing Operations and associated Electrostatic Precipitator (ESP);
- Slab and Torch cutting;
- Road dust from increased traffic; and
- Seven (7) Emergency Diesel Generators.

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

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1 *New Source Review Workshop Manual Prevention of Significant Deterioration and Nonattainment Area Permitting*, EPA, Draft October 1990.

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 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.

---

[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.

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. 81.210 – Steel Production Electric Arc Furnaces;
- Process Type No. 81.390 – Other Steel Foundry Processes;
- Process Type No. 81.380 – Scrap Handling and Preparation Processes;
- Process Type No. 81.370 – Miscellaneous Melt Shop Operations;
- Process Type No. 81.310 – Steel Foundry Electric Arc Furnaces;
- Process Type No. 81.220 – Steel Production Hot Metal Transfer and Ladle Processes;
- Process Type No. 81.340 – Steel Foundry Ladle Metallurgy Processes;
- Process Type No. 81.230 – Steel Production Casting and Pouring Processes;
- Process Type No. 81.350 – Steel Foundry Processes Casting and Pouring Processes;
- Process Type No. 81.290 – Other Steel Manufacturing Processes;
- Process Type No. 13.310 – Commercial/Institutional Size Boilers/ Furnaces, <100 MMBtu/hr, Natural Gas;
- Process Type No. 99.009 – Industrial Process Cooling Towers;
- Process Type No. 17.110 – Large Internal Combustion Engines (>500 HP) – Fuel Oil;
- Process Type No. 17.210 – Small Internal Combustion Engines (<500 HP) – Fuel Oil;
- Process Type No. 99.140 – Paved Roads; and
- Process Type No. 99.150 – Unpaved Roads.

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 FOR NEW MELT SHOPS & SUPPORTING EQUIPMENT

This section evaluates BACT for the combined emissions from the two (2) New Melt Shops as described in the permit application report. Each of the New Melt Shops will consist of material handling activities, one (1) new EAF, one (1) twin LMF, one (1) Continuous Caster with spray vent, one (1) degassing flare [one melt shop will have a Ruhrstahl-Heraeus (RH) flare and one melt shop will have a Vacuum Tank Degassing (VTD) Flare], and ladle/tundish preheating activities. The new melt shop with the RH flare will also have preheating stations which will function similar in nature to the ladle/tundish preheating activities, The exhausts from each of the individual melt shop sources (except for the continuous caster spray vent and degasser flare) will be combined prior to exhausting to the atmosphere through the respective New Melt Shop Baghouse. Each Melt Shop will also include one (1) degassing operation with flare control and a Continuous Caster Spray Vent as noted above. Section 1.3 includes a BACT analysis for supporting units, such as the cooling tower, slag handling and processing equipment, and torch and slab cutting activities.

Each proposed new single shell EAF will be powered by a transformer and natural gas-fired oxygen/fuel burners. The EAFs will operate in a batch mode whereby the scrap steel and scrap substitutes will be charged, melted, and then tapped to a ladle. The temperature of the exhaust gas from the EAFs will approach 3,000°F.

Each of the new EAFs will be equipped with a direct evacuation control (DEC) system (e.g., direct shell evacuation system or DSES) and an overhead roof exhaust system consisting of a canopy hood. Emissions generated during melting and refining will be captured and vented to a New Melt Shop Baghouse. The temperature of the exhaust stream from each of the New Melt Shop baghouses will be approximately 250°F.

Molten steel will be transferred by ladle to the twin LMF for steel refining. Each twin LMF will be equipped with a direct capture system that will capture and vent emissions to the corresponding New Melt Shop Baghouse.

During the steelmaking process, while molten steel is in the ladle and before it is poured, the steel (approximately 30%) must be degassed to remove unwanted gases that are dissolved in the liquid. Emissions from the degassing operation will be routed to a flare for control.

Ladles of molten steel will be transferred from the degassing operation or LMF by crane to the new Continuous Caster. The molten steel will drain into a vertical, water-cooled mold that is the desired width and thickness of the resulting slab. The continuous steel slab will exit at the bottom of the spray chamber where it will be torch cut at specified lengths into discreet slabs. Emissions generated during the casting process will be captured by the canopy hoods and vented to the corresponding New Melt Shop Baghouse. Steam generated from direct cooling will be captured by the caster steam exhaust system and released to the atmosphere through an emission stack on the roof.

A BACT analysis for PM, PM_{10}, $PM_{2.5}$, lead, CO, VOC, NO_x, SO_2, and GHG emissions from the New Melt Shops is included below. Each of the New Melt Shop Baghouses will have an exhaust flow rate of approximately 1,400,000 dscfm and an exhaust temperature of approximately 250°F.

1.2.1 BACT Determination for New Melt Shops - EAFs, LMFs and Continuous Casters

1.2.1.1 New Melt Shops - EAFs, LMFs and Continuous Casters PM/PM_{10}/$PM_{2.5}$ and Lead BACT

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for PM/PM_{10}/$PM_{2.5}$ and lead[3] established for the New Melt Shop operations. Potentially applicable control technologies include: baghouses, high-energy wet scrubbers, electrostatic precipitators (ESPs), and high efficiency cyclones.

BACT Floor

The requirements of 40 CFR Part 60, Subpart AAa - Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed after August 17, 1983 apply to the proposed EAFs as well as associated dust-handling equipment. The EAFs must, at a minimum comply with the applicable NSPS particulate matter emission limit of 0.0052 gr/dscf.

---

[3] Lead and other metals are present in the PM emissions from the melt shop sources (e.g., EAF, LMF, Continuous Caster). Because lead is a component of PM, the controls evaluated from PM reduction also apply to lead.

Step 1 – Identify Potential Control Technologies

Control efficiencies for potentially applicable technologies are shown in the table below.

Table 1-1: Potential Control Devices for $PM/PM_{10}/PM_{2.5}$ and Lead from the New Melt Shops

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ and Lead Control Efficiency[4]
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
Wet scrubber or high efficiency Venturi scrubber	70-99% (~0.01 gr/dscf)
ESP	95-99+% (0.002 – 0.004 gr/dscf)
High efficiency cyclone	80-99% for PM, 30-90% for PM_{10}, 0-40% for $PM_{2.5}$ (>0.01 gr/dscf)

The potentially applicable types of particulate control systems are described in detail below.

- ***Fabric Filters***[5] - 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. Baghouse technology has been used extensively to control filterable $PM/PM_{10}/PM_{2.5}$ and lead emissions from EAFs achieving outlet concentrations below 0.005 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 EAFs.
- ***Wet Scrubbers***[6, 7] - Wet scrubbers remove particulate matter from a gas stream by capturing it in liquid droplets and can be very efficient for removing $PM_{10}/PM_{2.5}$ and lead. 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.

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4 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.

5 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.

6 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

7 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.

- ***ESPs***[8, 9] - 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.
- ***High Efficiency Cyclones***[10] – 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}. Therefore, it is not considered a “best” available control technology.

Step 2 – Eliminate Technically Infeasible Options

ESPs

Several factors preclude ESP application to EAF 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 batch EAF operations. ESPs have not been used on EAFs and for the reasons outlined, are considered technically infeasible[11].

High Efficiency Cyclone

No BACT determinations were found that include the use of high efficiency cyclones or mechanical collectors, so this type of control is considered to be technically infeasible for removing fine PM emissions, including lead compounds. 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 – Rank Remaining Technically Feasible Control Options

The PM/PM_{10}/$PM_{2.5}$ and lead control technologies for the new EAF, LMF, Caster are ranked as follows:

1. Baghouse, 95% – 99+% (As low as 0.001 gr/dscf)

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8 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.

9 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.

10 Air Pollution Control Technology Fact Sheet: Cyclones, EPA- 452/F-03-005, Washington, D.C.: Clean Air Technology Center, July 2003.

11 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.

2. Wet Scrubber, 70% – 99% (~ 0.01 gr/dscf)

Step 4 – Evaluate Remaining Control Technologies

Fabric Filter (Baghouse)

A baghouse is well-suited for controlling emissions from an EAF 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 EAF particulate controls and the top ranked control technology for PM/PM_{10}/$PM_{2.5}$. AM/NS proposes to control emissions from each New Melt Shop with a New Melt Shop Baghouse.

Wet Scrubber or High Efficiency Venturi 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, AM/NS is proposing BACT to be 0.0018 gr/dcsf for PM (filterable) emissions, 0.0052 gr/dcsf for total PM_{10}/$PM_{2.5}$ (filterable and condensable) emissions, and 0.002 lb/ton of steel for lead emissions from the New Melt Shop Baghouses.

Step 5 – Selection of BACT

BACT Limit Overview

The search results from an RBLC review of EAF BACT emission limits reveal that the most stringent limits for EAF PM/PM_{10}/$PM_{2.5}$ are achieved by baghouse control. Based on this search for PM_{10} total (filterable plus condensable) and $PM_{2.5}$ total from EAFs in the last ten years, the majority of facilities including Nucor Steel Tuscaloosa (AL), Nucor Steel Decatur (AL), Steel Dynamics Southwest Steel Mill (TX), Republic Steel (OH), ArcelorMittal Vinton (TX) have established PM_{10} total limits of 0.0052 gr/dscf or greater. The Nucor Steel Berkeley facility's melt shop is designed such that there are 2 separate baghouses (furnace baghouse and canopy baghouse) which control emissions from the EAF processes. As such, the proposed PM_{10} total limit of 0.0052 gr/dscf is in line with the majority of results from the last ten years in the RBLC database.

For $PM_{2.5}$ total AM/NS has proposed a BACT limit of 0.0052 gr/dscf. Based on the RBLC search for $PM_{2.5}$ total from EAFs in the last ten years, 0.0052 gr/dscf is on the high end of results; however the most recent entry in the RBLC database at the time of submittal of this application was the Steel Dynamics Southwest Steel Mill which has a $PM_{2.5}$ total BACT limit of 0.0052 gr/dscf as well as the Nucor Steel Mill in Leon, Texas. Condensable PM can vary greatly depending on the type of steel being produced as well as the amount of organics present in the charge material in the EAFs and the variability of scrap. These components can greatly alter the composition of the exhaust stream and consequently, the condensable fraction of PM emissions. Therefore, predicting the actual emissions of condensable PM is extremely difficult and the emissions are highly variable. As such, it is not reasonable to directly compare each of the site-specific limits in the RBLC database to the proposed EAF. AM/NS would like to propose an initial $PM_{2.5}$ limit of 0.0052 gr/dscf with the opportunity to revise this emission rate based on actual stack test results to represent site-specific data. There is not expected to be a large particle size distribution between PM_{10} and $PM_{2.5}$ and a majority of the particulate is comprised of condensable matter (all condensable matter is $PM_{2.5}$), and due to the large makeup of condensable matter, it is not necessary to have different limits for PM_{10} and $PM_{2.5}$ total.

AM/NS proposes BACT to be the use of baghouses for control of PM (filterable) emissions and total $PM_{10}/PM_{2.5}$ (filterable and condensable) and lead emissions from the New Melt Shops. The proposed BACT emission limitations are 0.0018 gr/dcsf for PM (filterable) emissions, 0.0052 gr/dcsf for total $PM_{10}/PM_{2.5}$ (filterable and condensable) emissions, and 0.002 lb/ton of steel for lead emissions. AM/NS proposes to demonstrate ongoing compliance with the emission limitations in accordance with the requirements of NSPS Subpart AAa and will install a continuous opacity monitoring system (COMS) for the New Melt Shop Baghouses.

1.2.1.2 New Melt Shops - EAFs, LMFs and Continuous Casters NO_x BACT

With the exception of burner modifications, add-on control technologies for NO_x abatement have not been successfully implemented for EAF emissions. However, NO_x control technologies are currently available for fossil-fueled boilers, stationary combustion engines, and turbines. Thus, these control alternatives are potentially available to control NO_x from an EAF. The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for NO_x established for melting furnaces.

Step 1 – Identify Potential Control Technologies

NOx is formed from the chemical reaction between nitrogen and oxygen at high temperatures. NO_x formation occurs by different mechanisms. In the case of an EAF, NO_x predominantly forms from thermal dissociation and subsequent reaction of nitrogen and oxygen molecules in the combustion air, referred to as thermal NO_x. The other mechanisms of NO_x formation such as fuel NO_x (due to the evolution and reaction of fuel-bound nitrogen compounds with oxygen) and prompt NO_x (due to the formation of hydrogen cyanide [HCN] followed by oxidation to NO_x) have lesser contributions to NO_x emissions from an EAF. NO_x controls can be classified into two types: post-combustion methods and combustion control techniques. Post-combustion control methods include selective catalytic reduction (SCR), non-selective catalytic reduction (NSCR), and selective non-catalytic reduction (SNCR). Combustion control techniques include burner modifications, flue gas recirculation (FGR), low excess air firing (LEA), off-stoichiometric (or staged) combustion (OSC), or low nitrogen fuel (if applicable and available). A review of the RBLC indicates that no add-on control device has ever been required for EAF NO_x control. Nevertheless, summary of potentially applicable control technologies and corresponding control efficiencies are shown in the table below.

Table 1-2: Potential Control Devices for NO_x from New Melt Shops

Control Type	Estimated NO_x Control Efficiency
Oxy-fuel fired burners	70%-85%
SCR	70%-90%
NSCR	80%-90%
SNCR	40%-75%

The alternatives available to control NO_x emissions from the EAFs include the following:

- ***Oxy-fuel Burner***[12] – Specifically designed burners can be a combustion control technique to increase combustion efficiency by firing burners with O_2 instead of air. The conversion to O_2 firing instead of air firing reduces NO_x emissions by eliminating some of the N_2 in combustion air. In addition, when small amounts of combustion air are replaced with O_2, a significant increase in flame

[12] *Technical Bulletin: Nitrogen Oxides (NO_x) Why and How They Are Controlled,* EPA-456/F-99-006R, Research Triangle Park, NC: Office of Air Quality Planning and Standards, November 1999.

temperature can be realized and an intense flame is produced. Excess fuel air or steam, injected just after the combustion chamber, is sufficient to rapidly quench the flue gas to temperatures below the NO_x formation temperature range. Combustion can then be completed in over fire air. (This technique also is used with low-NO_x burners to prevent the formation of prompt NO_x).

- ***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 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

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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

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.

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.

Step 2 – Eliminate Technically Infeasible Options

SCR

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. EAF exhaust temperatures will vary widely over the melt cycle, and the gas flow rates and NO_x concentrations will exhibit a wide amplitude. The SCR system cannot be installed after particulate removal due to unacceptably low temperatures outside the effective operating range (below 250°F). In addition, certain elements such as iron, nickel, chromium, and zinc can react with platinum catalysts to form compounds or alloys that are not catalytically active. These reactions are termed “catalytic poisoning,” and can result in premature replacement of the catalyst. EAF flue gas often contains a number of these catalytic poisons. In addition, any solid material in the gas stream can form deposits and result in fouling or masking of the catalytic surface. Fouling occurs when solids obstruct the cell openings within the catalyst. Masking occurs when a film forms on the surface of catalyst over time. The film prevents contact between the catalytic surface and the flue gas. Both of these conditions can result in frequent cleaning and/or replacement requirements.

In addition to the above technical issues regarding effective applicability of SCR systems to EAFs, the technology is also associated with the following negative environmental impacts:

- Unreacted ammonia (around 5 parts per million by volume (ppmv) to 10 ppmv) would be emitted to the environment as ammonia slip. Based on conservative estimates of a 7 ppmv ammonia slip, approximately 100 tons per year of ammonia could be potentially emitted from each new EAF;
- Formation of ammonium salts can readily foul the catalyst section, resulting in reduced efficiency and increased backpressure;
- Small amounts of ammonium salts would be emitted as $PM_{10}/PM_{2.5}$;
- Safety issues associated with the transportation, handling and storage of aqueous ammonia; and
- Potentially hazardous waste handling and disposal of spent catalyst.

There are currently no known successful applications of SCR technology to control NO_x emissions from EAFs. SCR is considered technically infeasible with unresolved technical issues and potentially significant environmental impacts and will not be considered any further in this BACT analysis.

NSCR

Currently, NSCR systems are limited to rich-burn internal combustion (IC) engines with fuel rich ignition system applications with low oxygen levels and have strict stoichiometric combustion requirements. Moreover, potential problems with NSCR systems include catalyst poisoning by phosphorus and zinc (present in galvanized scrap steel charged in the EAF). NSCR is considered technically infeasible for this application and will not be considered any further in this BACT analysis.

SNCR

In order for the SNCR to effectively reduce NO_x emissions, the exhaust gas stream should have relatively stable gas flow rates (to ensure the required residence time of 1.0 seconds), be within the prescribed temperature range, and have a steady NO_x concentration. EAF exhaust temperatures will vary widely over the melt cycles, and will not remain in the desired temperature window during all phases of operation. Similarly, the gas flow rates will not remain stable during furnace operation, precluding the possibility of adequate residence time. The nature of EAF operations do not afford any of these conditions which will significantly impair the effective control efficiency of SNCR.

Furthermore, an SNCR system would have to be located upstream of the EAF baghouse; however, the temperature range at this location would be approximately 300 °F to 400 °F. The EAF baghouse inlets will be less than 300°F (approximately 250°F). An SNCR system cannot be placed further upstream due to operational hazards. Any injection mechanism upstream of the baghouse would be susceptible to prompt particulate fouling. The use of relatively large amounts of ammonia will have accidental release and hazardous impact implications. It should be noted that if the required residence time or other optimum operation parameters are not available, unreacted ammonia will be released directly to the atmosphere. A 7 ppm ammonia slip will result in emissions of approximately 100 tons per year of ammonia from each new EAF. For these reasons, SNCR is technically infeasible for this application and will not be considered any further in this BACT analysis.

Step 3 – Rank Remaining Technically Feasible Control Options

Oxy-fuel Burners are the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

Oxy-fuel fired burners are the most efficient and effective control of NO_x emissions for the new EAFs. AM/NS is proposing to utilize oxy-fuel fired burners mounted at strategic locations around the furnace shell. AM/NS is proposing a NO_x emissions limit of 0.35 lb NO_x/ton to account for variability in the exhaust stream.

Step 5 – Selection of BACT

BACT Limit Overview

RBLC search results for NO_x BACT emission limits for EAFs indicate that the concentration established as BACT ranges from 0.2 lb NO_x/ton to 1.43 lb NO_x/ton, with an average emission rate of 0.46 lb NO_x/ton for similar emission sources. The most stringent limits are achieved by using natural gas-fired oxy-fuel burners and good combustion practices.

AM/NS proposes BACT to be the use of natural gas-fired oxy-fuel burners to control NO_x emissions. The proposed BACT emission limit is 0.35 lb/ton of liquid steel. AM/NS proposes to demonstrate compliance with the emission limitations through the use of performance testing.

1.2.1.3 New Melt Shops - EAFs, LMFs and Continuous Casters CO & VOC BACT

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for CO and VOC emissions established for EAF operations.

Step 1 – Identify Potential Control Technologies

CO and VOCs are formed through the incomplete oxidation of organic material to carbon dioxide (CO_2). CO will be emitted as a byproduct of incomplete combustion from the following potential sources - charged and injected carbon, scrap steel, and scrap substitute inherent carbon content, electrodes, and “foaming slag” operating practice. EAFs generate CO as a result of oxidation of carbon introduced into the furnace charge to refine the steel and as a result of the sublimation/oxidation of the carbon electrode. VOCs arise from the combustion of fuel and from the volatilization of organic compounds during the melting process, primarily when organic compounds such as oil or paint present in the scrap are volatilized. Factors that may lead to the formation of CO and VOCs include inadequate air flow rates, inadequate mixing of air and fuel, and improper temperatures in combustion zones.

There is a prompt scrap deficit in the Unites States scrap market with EAFs already consuming greater amounts of prompt scrap than is currently in the United States. The lack of availability of this material (clean steel sheet, clips, etc.) causes increased use of obsolete scrap types.

Obsolete scrap, shredded cars, and plate and structural are more widely available as the United States is a net exporter, but these materials are more likely to contain oils or paint. These materials are typically sourced in large quantities from large urban centers. There are currently other EAFs geographically located between these southeast urban centers and AM/NS. These other mills have already set up supply chains to acquire the "cleanest" sources of obsolete scrap in these areas. The scrap market will be especially difficult for AM/NS to enter as other existing steel mills have ongoing relationships with scrap suppliers, thus providing AM/NS with lower quality scrap compared to other existing steel mills.

Potentially applicable controls include afterburners, regenerative thermal oxidation, recuperative thermal oxidation, and other process technologies. Control efficiencies for potentially applicable technologies are shown in the table below.

Table 1-3: Potential Control Devices for CO & VOC from New Melt Shops

Control Type	Estimated CO, VOC Control Efficiency
Good combustion practices	Varies
Scrap management to minimize oil	Varies
Scrap degreasing	Varies
CO oxidation catalysts	>90%
Post combustion reaction chamber	95% - 99+%
Thermal oxidizer (afterburner)	98% - 99+%
Recuperative thermal oxidizer	98% - 99+%
Regenerative thermal oxidizer	95% - 99%
Catalytic oxidizer	90% - 99%
Oxygen injection	Varies
Direct evacuation control	Varies

CO and VOC emission control beyond inherent control achieved by the EAF DEC design can be achieved by:

- ***Good Combustion Practices -*** Good combustion practices can be implemented to maintain proper operating conditions. Examples of good combustion practices include: maintaining operating logs and recordkeeping, training, maintenance knowledge, routine and preventive maintenance, burner and control adjustments, monitoring fuel quality, etc.
- ***Scrap Management to Minimize Oil -*** Scrap management reduces the amount of material with excess oils from entering the melting furnace, which can directly reduce VOC emissions.
- ***Scrap Degreasing –*** Scrap degreasing reduces the amount of oils and lubricants present in the scrap, which can directly reduce VOC emissions. Scrap degreasing can be performed by utilizing different types of solvents to remove oils and lubricants.
- ***Add-on Controls (that will facilitate the further oxidation of CO to CO_2) –*** In situations where CO and VOC are generated by process activities (such as chemical reactions) or where combustion equipment design modifications are inadequate to achieve the desired level of control, add-on

controls may be necessary to limit CO and VOC emissions. Add-on control equipment for CO and VOC includes thermal or catalytic oxidation techniques to convert CO and VOC to CO_2. The choice of controls is based upon several factors, including the degree of control desired, the concentration of CO and VOC in the air stream, and other physical characteristics of the exhaust stream (including the presence of other pollutants).

The destruction of organic compounds usually requires temperatures ranging from 1,200°F to 2,200°F for direct thermal oxidizers or 600°F to 1,250°F for catalytic systems. Combustion temperature depends on the chemical composition and the desired destruction efficiency. CO_2 and water vapor are the typical products of complete combustion. Turbulent mixing and combustion chamber retention times of 0.75 seconds or greater are needed to obtain high destruction efficiencies. However, high control efficiencies may not be achievable in gas flows with low CO and VOC concentrations. As a result, the cost of combustion may be limiting for high gas flows with low CO and VOC concentrations.

The potentially applicable types of CO and VOC controls are described in detail below.

- ***CO Oxidation Catalysts -*** Catalytic oxidation systems promote the oxidation of CO (and VOC) compounds to form CO_2 and water. For a catalytic oxidation system to operate correctly, the exhaust gas must contain excess O_2 and must be within a particular temperature range depending on the type of catalyst material used. Exhaust gas temperatures that are too high may cause permanent damage to the catalyst, while operating temperatures that are too low result in lower pollutant conversion efficiency. Catalysts are typically made from a precious metal such as platinum, palladium, or rhodium. The typical CO removal efficiency of a catalytic oxidation system is 90% or greater.
- ***Post Combustion Reaction Chamber (with burners and combustion air)*** – In this technique, EAF exhaust gases are raised to a sufficiently high temperature for a minimum amount of time to facilitate oxidation. The combustion chamber configuration must provide effective mixing within the chamber with an acceptable residence time. Recuperative heat exchangers can be used with these systems to recover a portion of the exiting exhaust gas heat and reduce the auxiliary fuel consumption.
- ***Thermal Oxidation***[17] - 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***[18,19] ***-*** 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

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17 Air Pollution Control Technology Fact Sheet: Thermal Incinerator, EPA-452/F-03-022, Washington, D.C.: Clean Air Technology Center, July 2003.

18 Air Pollution Control Technology Fact Sheet: Incinerator – Recuperative Type, EPA-452/F-03-020. Washington, D.C.: Clean Air Technology Center, July 2003.

19 Air Pollution Control Technology Fact Sheet: Regenerative Incinerator, EPA-452/F-03-021. Washington, D.C.: Clean Air Technology Center, July 2003.

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 CO and VOC conversion efficiency. The typical CO and VOC removal efficiency of a catalytic oxidation system is 90% or greater. The catalytic oxidation process for CO and VOC control is very temperature sensitive.
- ***Oxygen Injection -*** A theoretical means of destructing CO and VOC would be oxygen injection at the entrance of the ductwork to increase oxidation of the available CO and VOC to CO_2. The increase in CO and VOC oxidation that could be achieved, however, is unknown. Oxygen injection into the furnace is an experimental operating practice in Europe used to increase the heat input to the melt, not to reduce CO and VOC emissions. This approach would be purely experimental and is a procedure that is currently not conducted in EAF operations in steel mills in the United States.
- ***Direct Evacuation Control -*** In the steel industry, there are two principal systems employed during EAF operation to control the process emissions generated during melting and refining. These two systems are DSE and side draft hood systems. DSE only works when the furnace is up-right with the roof in place and consists of ductwork attached to a separate, or fourth hole, in the furnace roof, which draws emissions to a gas cleaner. Side draft hoods collect furnace off gases from around the electrode holes and the work doors after the gases leave the furnace. Side draft hood systems require higher airflow rates than DSE systems and are not widely used.

Step 2 – Eliminate Technically Infeasible Options

CO Oxidation Catalysts

Based upon a review of available information, there is no known application of CO oxidation catalysts to control CO emissions from an EAF. The optimal working temperature range for CO oxidation catalysts is approximately 850°F to 1,100°F with a minimum exhaust gas stream temperature of 500°F for minimally acceptable CO control. Exhaust gases from the EAF will undergo rapid cooling as they are ducted from the furnace. Thus, the temperature will not be in the optimal range for effective operation of CO oxidation catalysts during much of the EAF operation, especially considering temperature variations throughout the various heat stages. Additionally, the particulate loading in the exhaust gas stream prior to the baghouse will be too high for efficient operation of a CO oxidation catalyst. Masking effects such as plugging and coating of the catalyst surface would almost certainly result in impractical maintenance requirements, and would significantly degrade the performance of the catalyst. Consequently, this control alternative is considered technically infeasible for this application and will not be considered any further in this BACT analysis.

Post Combustion Reaction Chambers (with burners and combustion air)

Potentially, there are two locations where post combustion chambers can be installed, i.e., upstream or downstream of an EAF baghouse. Due to high particulate loading of EAF exhaust gases, it would be necessary to operate a baghouse prior to the post combustion reaction chamber. However, the baghouse exhaust gases would require reheating to bring the temperature from 250°F up to 1350°F. Exhaust reheat would require significant natural gas fuel combustion and would cause additional NO_x emissions. Based upon a review of available information, there is no known successful application of post combustion reaction chambers with duct burners to control VOC or CO emissions from an EAF. The examples below document technical difficulties encountered with post combustion reaction chambers.

- IPSCO Steel in Iowa was issued a PSD permit in April 1996 that required installation of a post combustion reaction chamber to limit CO emissions to 0.91 lb/ton of steel. In 2002, the IPSCO Steel permit limit was increased to 1.93 lb/ton of steel, only slightly below the generally accepted BACT limit. It is reasonable to assume that the post combustion reaction chamber could not achieve the destruction efficiency beyond typical DEC systems.
- Tuscaloosa Steel in Alabama installed a post combustion reaction chamber with oxy-fuel burners on a trial basis for meeting their CO BACT limit of 2.0 lb/ton of steel. This installation was not required by BACT and the chamber burners were removed due to demanding maintenance because of particulate plugging, rendering the control unreliable and possibly ineffective.
- Chapparral (Virginia) Inc. (CVI) was issued a permit in 1998 that required the installation of post combustion chamber burners. During a May 2000 source test, it was discovered that CVI had not been operating the burners. CVI later submitted a revised permit application to control CO emissions through the "intermittent" use of post-EAF burners (shaft and/or post-combustion chamber burners) to maintain compliance with CO emission limits. According to the Minor NSR Coordinator at Virginia Department of Environmental Quality (VDEQ), the post-EAF burners are located in the "shaft" as opposed to a dedicated "combustion chamber." According to VDEQ, the EAF emits about 7.6 lb CO/ton and VDEQ cannot ascertain how frequently the shaft burners are actually firing. The EAF at CVI has a different design (i.e., single shaft EAF) than the proposed EAF and emits CO at a significantly higher rate than the proposed CO BACT limit of 2.0 lb/ton for the proposed EAF.

The amount of CO and VOC which could be oxidized with post combustion systems is uncertain, and precise performance guarantees are expected to be difficult to obtain from equipment manufacturers because of the lack of operating experience. In addition, auxiliary fuel combustion would result in additional emissions of NO_x. Further, due to the heat and particulate loading, the burners would have a short life expectancy, and may sustain severe maintenance and reliability problems. Additionally, a single or multiple duct burner system would not be able to adequately heat the relatively cool gases from the EAF during cold cycling.

It is clear that the post combustion reaction chamber (with burners and combustion air) is not a "demonstrated" technology for this application and has proven to have technical challenges that prohibit successful implementation for CO and VOC reduction. Therefore, post combustion reaction chambers with burners and additional combustion air are considered technically infeasible and are eliminated from further consideration.

Thermal Oxidation, Regenerative Oxidation, and Recuperative Oxidation

Based upon a review of the previously listed information resources, there is no known successful application of thermal oxidizers to control CO or VOC emissions from an EAF of this size. The amount of CO and VOC which could be oxidized with a thermal oxidizer system is uncertain, and precise performance guarantees are expected to be difficult to obtain from equipment manufacturers because of the lack of operating experience. Furthermore, due to the particulate loading in EAF exhaust gas, thermal oxidizer burners would have a short life expectancy, and would sustain severe maintenance and reliability problems. Issues related to thermal oxidation systems are similar to those identified for post combustion reaction chambers with duct burners. The use of thermal oxidation systems is considered technically infeasible for the proposed EAFs and will not be considered any further in this BACT analysis.

Catalytic Oxidation

Based upon a review of available information, there is no known application of catalytic oxidation to control CO or VOC emissions from EAFs. Catalytic oxidation systems are limited in application due to potential poisoning, deactivation, and/or blinding of the catalyst. Lead, arsenic, vanadium, and phosphorus are generally considered poisons to catalysts and deactivate the available reaction sites on the catalyst surface. Particulate can also build up on the catalyst, effectively blocking the porous catalyst matrix and rendering the catalyst inactive. In cases of significant levels of poisoning compounds and particulate loading, catalyst replacement costs are significant.

Installation of oxidation thermal or catalytic oxidation systems after EAF baghouse control would require significant reheating of large air streams and would result in significant energy demands, which further render these technologies technically infeasible. For these reasons, potential fouling due to particulate matter, and lack of application of catalytic or thermal oxidation in the steel industry, these control alternatives are considered technically infeasible and will not be considered any further in this BACT analysis.

Oxygen Injection

Based upon a review of the previously-listed information resources, there is no known application of oxygen injection for controlling CO (or VOC) emissions from an EAF. Oxygen injection directly into the furnace is an experimental operating practice in Europe used to increase the heat input to the melt, but the practice has not been demonstrated to reduce CO or VOC emissions.

Typically, the DSE system will draw air into the duct, creating an oxygen-rich mixture of EAF exhaust gases where CO and VOC are oxidized. The addition of oxygen is expected to provide little if any additional conversion of CO or VOC. Further, the exhaust must be cooled to 250˚F prior to entering the baghouse (well below the auto ignition[20] temperature of CO). Consequently, this control alternative is considered technically infeasible for this application and will not be considered any further in this BACT analysis.

Step 3 – Rank Remaining Technically Feasible Control Options

The VOC and CO control technologies for the new EAF are ranked as follows:

- Direct Evacuation Control (CO)
- Scrap Management to Minimize Oil (VOC)
- Scrap Degreasing (VOC)
- Good Combustion Practices (CO and VOC)

Step 4 – Evaluate Remaining Control Technologies

It is important to note BACT limitations do not necessarily reflect the highest possible control efficiency achievable by the technology on which the emission limitation is based. BACT must be achievable on a consistent basis under normal operating conditions. The permitting authority has the discretion to base the emission limitation lower than the optimal design level. Improvements in the proposed control level are limited by the current technology of filter bag media which can also withstand the variability of temperature and particulate loading associated with an EAF steel mill, and these limits represent a high

[20] The auto-ignition temperature of CO is approximately 1130°F. This is the point at which CO will spontaneously ignite in a normal atmosphere without an external ignition source and is the temperature required to supply the activation energy for combustion. Hence, a temperature of 1350°F is the typically the minimum temperature required for oxidation systems.

level of performance against peer steel mills in the industry. Based on vendor design data, an emission rate of 0.13 lb VOC/ton of liquid steel is feasible for this type of process.

Based upon a review of available information, DEC systems continue to be the primary control technology for controlling CO emissions from an EAF. During melting and refining, a slight negative pressure will be maintained within the furnace to withdraw exhaust gases through the DEC duct. The DEC allows for a high process emissions capture efficiency and high CO destruction efficiency. There is an inverse relationship between CO and NO_x concentrations. When CO concentration is peaking, the NO_x concentration is low, and NO_x appears to peak with a drop in CO concentration. This indicates that CO combustion in the DEC is influenced by oxygen availability. Therefore, the DEC must be properly designed for optimal combustion of CO without causing unnecessary drafting of the furnace, which could adversely affect NO_x emissions. A properly designed DEC will have minimal environmental impacts due to NO_x emissions.

Based upon a review of available information, scrap management is the primary control technique for controlling VOC emissions from an EAF and is selected as BACT. AM/NS will utilize a scrap management program to eliminate the purchase of scrap steel that is heavily oiled or that contains organic liquids. A scrap management program will be used to employ work practices to reduce VOC, and may include:

- General scrap specifications;
- Verification of compliance with specifications (e.g., inspections); and
- Corrective actions for nonconforming scrap.

Scrap degreasing requires the use of various different types of solvents to remove oils and lubricants from scrap metal prior to charging the EAF. Additional emissions will be generated through the use of solvents for scrap degreasing. The amount of emissions generated by degreasing the large amount of scrap used annually in the EAFs can potentially outweigh the reduction emissions from scrap degreasing. As discussed above, the proposed scrap management program will require the selection of appropriate vendors to eliminate the purchase of scrap that is heavily oiled or that contains organic liquid, will require verification of compliance with specifications through scrap inspections, and will require corrective actions for nonconforming scrap. Additionally, based on a review of the RBLC database, no entries include the use of scrap degreasing as a control for VOC.

AM/NS has performed a cost effectiveness analysis (Table 1-4) for the use of scrap degreasing based on the EPA Air Pollution Control Manual, Sixth Edition (EPA/452/B-02-001, January 2002) example for a Carbon Adsorber System. The cost effectiveness analysis estimates that the cost for VOC control would be $65,944/ton based on a 5% interest rate and 20 year equipment life, which is well above an acceptable range for VOC. The equipment cost and annual supplies cost are based on best engineering judgement and similar applications ($25,000/1000 tons of scrap) and $1,000,000 per year.

Table 1-4: Cost Effectiveness Analysis for VOC Control from Scrap Degreasing

Direct Costs		
Purchased Equipment Costs (PEC)		
Equipment Cost (EC)	Best Engineering Judgement	$100,213,750
Instrumentation	10% EC	$10,021,375
Sales Tax	3% EC	$3,006,413
Freight	5% EC	$5,010,688
Total PEC		$118,252,225

Direct Installation Costs		
Foundations and Supports	8% PEC	$9,460,178
Handling and Erection	14% PEC	$16,555,312
Electrical	4% PEC	$4,730,089
Piping	2% PEC	$2,365,045
Insulation for Ductwork	1% PEC	$1,182,522
Painting	2% PEC	$2,365,045
Direct Installation Costs		$36,658,190
Total Direct Capital Costs (TDC)		$154,910,415
Indirect Installation Costs		
Engineering	10% PEC	$11,825,223
Construction and Field Expenses	5% PEC	$5,912,611
Contractor Fees	10% PEC	$11,825,223
Start-up	2% PEC	$2,365,045
Performance Test	1% PEC	$1,182,522
Contingencies	3% PEC	$3,547,567
Total Indirect Installation Costs		$36,658,190
Direct Annual Costs		
Expendable Supplies	Best Engineering Judgement	$1,000,000
Total Direct Annual Costs		$1,000,000
Capital Recovery Costs	Capital Recovery Factor (5% Interest and 20 Year Equipment Life)	$15,371,960.45
Total Annualized Cost		$16,371,960
Cost Effectiveness		
VOC Emissions from EAF 1 and EAF 2 (tpy)		250.78
VOC Controlled Emission Rate (99% Control Efficiency)		2.51
VOC Emissions Reduction		248.27
Cost Effectiveness ($/ton)		$65,944

Good combustion practices will be implemented to maintain proper operating conditions for the reduction of CO and VOC emissions generated from incomplete combustion. Examples of good combustion practices include: maintaining operating logs and recordkeeping, training, maintenance knowledge, routine and preventive maintenance, burner and control adjustments, and monitoring fuel quality.

Step 5 – Selection of BACT

BACT Limit Overview

A review of the RBLC database revealed that other steel mills (not including steel foundries) have an emission limit ranging from 1.99 lb CO/ton of steel to 4.8 lb CO/ton of steel. A review of the RBLC database revealed that other steel mills have an emission limit ranging from 0.07 lb VOC/ton of steel to 0.43 lb VOC/ton of steel. VOCs arise from the combustion of fuel and from the volatilization of organic compounds during the melting process, primarily when organic compounds such as oil or paint present in the scrap are volatilized; therefore, the amount of VOC emissions is heavily dependent on the raw materials and variability of scrap processed in the EAF and can vary greatly depending on the type of steel being produced. As such, it is not reasonable to directly compare site-specific limits.

AM/NS proposes BACT to be DEC for control of CO emissions, a scrap management plan to minimize oil for control of VOC emissions, and good combustion practices for control of CO and VOC emissions. The proposed BACT emission limitations are 2.2 lb CO/ton of liquid steel produced and 0.13 lb VOC/ton of liquid steel based on relevant RBLC search results and vendor performance testing. AM/NS proposes to demonstrate ongoing compliance with the CO BACT emission limitation through the use of performance testing. AM/NS proposes to demonstrate ongoing compliance with the VOC BACT emission limitation through recordkeeping, certification of compliance with the scrap management plan to minimize oil and reduce the purchase of scrap steel that is heavily oiled.

1.2.1.4 New Melt Shops - EAFs, LMFs and Continuous Casters SO_2 BACT

The level of SO_2 emissions from the New Melt Shops is attributable to the sulfur content of the raw materials charged to the EAFs. A majority of the sulfur reacts in the molten metal and slag to form sulfides in the slag and some of the sulfur may oxidize at the slag surface or in the furnace headspace to form SO_2 and be exhausted from the furnace.

- Carbon is a main charge component and has three different uses at the EAF: inherent carbon content in scrap and scrap substitutes, charge carbon (bucket fed and top fed), and injection carbon.
- Scrap/Scrap Substitute **–** This carbon is inherent in the scrap/scrap substitute charge fed to the furnace and is consumed in the liquid phase of the steel. As such, it has a high heating efficiency and the majority of the sulfur remains dissolved in the steel*.*
- Charge Carbon **–** This carbon is used to increase the amount of carbon in the liquid steel bath. Approximately 35% to 50% of the fixed carbon can be picked up in the bath. The balance of the fixed carbon acts on the slag (reducing iron (II) oxide [FeO] similar to injection carbon but without the foaming effect) or burns in the top space. Due to slag and metal mixing during charging, about half of the sulfur leaves as sulfur oxides (SO_x), while the remainder stays in the steel and slag.
- Injection Carbon **–** This is a carbon media that is injected into the slag layer where it reduces FeO and generates CO gas. The injection carbon foams the slag and improves electrical efficiency. Approximately 65% to 85% of the fixed carbon reduces FeO. Reaction in the middle of the slag layer results in approximately one half of the sulfur leaves as SO_x, while the remainder stays in the steel and slag.

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for SO_2 established for EAF operations.

Step 1 – Identify Potential Control Technologies

Potential controls include wet scrubbers or Venturi scrubbers and sorbent injection systems with upstream filtration. These types of controls are effective for reducing SO_2 emissions, as well as for reducing emissions of acid gases (such as sulfuric, hydrochloric, and hydrofluoric acid). Control efficiencies for potentially applicable technologies are shown in the table below.

Table 1-5: Potential Control Devices for SO_2 from New Melt Shops

Control Type	Estimated SO_2 Control Efficiency
Lower-sulfur charge substitution	Varies
Scrap management to minimize oil	Varies
Wet scrubber	90%-98%
Dry scrubber	50%-90%
Sorbent injection system	50%-95%

A review of the RBLC indicates that no add-on control device has ever been required for EAF SO_2 control. The alternatives available to control SO_2 emissions can be categorized as material substitution/management or add-on control.

Material substitution/management include the following options:

- ***Lower-Sulfur Charge Substitution*** – SO_2 emissions are directly related to the amount of sulfur charged into the EAF. Low-sulfur bearing raw materials include low sulfur injection carbon and charge carbon. Both low sulfur injection carbon and charge carbon materials have uncertain future availability.

  - Petroleum coke is high in fixed carbon, has a relatively low sulfur content (~1%), and is low in ash. Petroleum coke has a small size (less than ¼ inch) making it difficult to use as charge carbon. Due to high demand in recent years, the cost of petroleum coke has increased and the availability has decreased. Blends of high and low sulfur content (2-3%) petroleum cokes are available. As the supply of these blends decreases, more anthracite coal and metallurgical coal are blended to compensate for reduced supply.

  - Metallurgical coke can be used as injection carbon and charge carbon. Metallurgical coke has a high fixed carbon content and a larger size than petroleum coke. Metallurgical can however retain water which can be an explosion hazard. There are precautions to drain water and avoid ice for safety. Metallurgical coke has an ash content of 10 – 20 % and is abrasive in nature making it difficult to use as an injection carbon. Metallurgical coke can also erode pneumatic pipes and hoses at an unacceptable rate.

  - Anthracite coal is the primary coal utilized for EAF steelmaking. Bituminous coal can be used as charge carbon, but it contains a higher volatile content and has lower ignition and flash points compared to anthracite coal.

- ***Scrap Management to Minimize Oil*** –Reducing the amount of material with excess sulfur-containing oils from entering the melting furnace can directly reduce SO_2 emissions.

In general, FGD systems remove SO_2 from exhaust streams by using an alkaline reagent to form sulfite and sulfate salts by either a wet or dry contact system. Control technologies for SO_2 and acid gases include the following types of FGD controls:

- ***Wet Scrubber***[21] ***–*** In a wet scrubber, the gas stream is brought into contact with a scrubbing liquid, typically by spraying the liquid in a contacting tower. Depending upon the removal efficiency and scrubbing reagent, the contacting device can be a Venturi, spray tower, packed tower, or other device that provides excellent gas-liquid contact. FGD wet scrubbers typically employ sodium, calcium, or dual-alkali reagents using packed or spray towers. The required excess of reactant in the solution to achieve high acid gas dissolution rates is small. The reaction rate is mainly determined by the absorption of gas by the liquid. Wet FGD systems generate wastewater and wet sludge streams requiring treatment and disposal. Wet scrubber system disadvantages include waste treatment and higher energy consumption.
- ***Dry Scrubber –*** Dry scrubbing systems pump an absorbing solution to rotary atomizers, which create a spray of fine droplets. Droplets mix with the incoming SO_2-laden exhaust gas in a large chamber and subsequent absorption leads to the formation of sulfites and sulfates within the droplets. Simultaneously, the sensible heat of the exhaust gas evaporates the water in the droplets, forming a dry powder mixture before the gas leaves the chamber. The temperature of the desulfurized gas is 30°F to 50°F above its dew point. Typically, baghouses are utilized to collect reacted byproducts from the gas stream. The advantage of fabric filters is that efficiency is largely insensitive to the physical characteristics of the gas stream and changes in the dust loading. In order to reduce the sorbent requirements, these systems typically recycle most of the baghouse collection into the feed system to promote better sorbent utilization. Furthermore, filter cake on the fabric due to deposited absorption reagent, can improve the absorption of acid gases.
- ***Sorbent Injection System –*** Dry or semi-dry sorbent can be injected directly into the exhaust gas stream. This process was developed as a lower cost option to conventional FGD technology. Since the sorbent is injected directly into the gas stream, the mixing offered by the dry scrubber tower is not realized. If sufficient amounts of reactants are introduced into the flue gas, there is a possibility of some degree of mixing and reaction. The science is inexact and the coupling of reactant dosage and in-flue mixing, which impacts the SO_2 control efficiency, is susceptible to variability in SO_2 concentrations. Similar to dry scrubber systems, baghouses are utilized to collect reacted byproducts from the gas stream and these systems typically recycle most of the baghouse collection into the feed system to promote better sorbent utilization.

Step 2 – Eliminate Technically Infeasible Options

Wet Scrubber

Exhaust streams laden with particulates are problematic for wet scrubber systems because particulates plug spray nozzles, packing, plates, and trays. For this reason, a wet scrubber would have to be located downstream of the EAF baghouse. Add-on flue gas SO_2 controls are typically applied to exhaust streams with an uncontrolled SO_2 concentration of 500 ppmv to 2,000 ppmv. The SO_2 concentration of the EAF exhaust stream will be less than 20 ppmv and varies widely over the EAF cycle, which greatly reduces the potential removal effectiveness. Due to the variability of SO_2 emissions and low SO_2 concentrations, along with variable gas flow and temperature due to thermal cycling, a wet scrubber is not technically feasible for controlling SO_2 emissions from the proposed EAF. AM/NS is not aware of any wet scrubbing system used on an EAF due to technical issues with this type of installation. For these reasons, wet scrubbing is not technically feasible and will not be evaluated further.

[21] Air Pollution Control Technology Fact Sheet: Flue Gas Desulfurization (FGD) – Wet, Spray Dry, and Dry Scrubbers, EPA- 452/F-03-034, Washington, D.C.: Clean Air Technology Center, July 2003.

Dry Scrubber

The SO_2 concentration of the EAF exhaust stream will be less than 20 ppmv and varies widely over the EAF cycle, which greatly reduces the potential removal effectiveness. Due to the low SO_2 concentration in the influent, coupled with a high exhaust rate from each New Melt Shop (1,392,300 dscfm), adequate contact with the reagent and SO_2 will be limited. The SO_2 concentration rate will vary widely over the EAF cycle, which will impair the system's capability to respond adequately because these systems are not designed to adjust for load flexibility. This control alternative has significant limitations. The temperature of the EAF exhausts will be less than 300°F, which is too low for effective operation of a dry scrubber system. Thermal cycling during the regular batch operation of the EAF could result in temperature approaching saturation, thereby raising the prospect of wet fouling. AM/NS is not aware of any dry scrubbing system used on an EAF due to technical issues with this type of installation. For these reasons, dry scrubbing is not technically feasible and will not be evaluated further.

Sorbent Injection Systems

The SO_2 concentration of the EAF exhaust streams will be less than 20 ppmv and varies widely over the EAF cycles, which greatly reduces the potential removal effectiveness. Variations in the SO_2 concentration would impair the control system's ability to respond with adequate sorbent injection because these systems are not designed to adjust for load flexibility and variable dose control with fast response times. For these reasons, dry scrubbing is not technically feasible and will not be evaluated further.

Step 3 – Rank Remaining Technically Feasible Control Options

1. Scrap Management to Minimize Oil
2. Lower-Sulfur Charge Substitution

Step 4 – Evaluate Remaining Control Technologies

Lower-Sulfur Charge Substitution

As discussed in Step 1 of this section, petroleum coke sulfur concentrations have been increasing and the availability of lower sulfur petroleum coke has steadily been decreasing. Metallurgical coke is limited as well and is not ideal to be used as injection carbon. This leaves anthracite coal as the remaining source for carbon as bituminous coals are not as suitable. Sulfur concentrations in anthracite coal have been increasing and the supply of lower sulfur coals has been diminishing, as such both low sulfur injection carbon and charge carbon materials have uncertain future availability. AM/NS is seeking to ensure that the BACT determination does not "lock in" a reliance upon low sulfur materials with an extremely low sulfur content, including carbon/coke that may not be available in the longer term. Charge substitution with lower sulfur-bearing raw materials is not practical due to inconsistent availability. BACT must be determined to be at a level that will be attainable and achievable in the future. Due to decreasing availability, increasing costs, and consequent difficulty relying upon sulfur feedstocks for demonstrating compliance, lower sulfur feedstocks, including carbon sources, are not technically feasible and would not be economically feasible. A scrap management program will be implemented to monitor the sulfur content in the charge and reduce sulfur-containing materials.

Scrap management to minimize oil does not have any adverse environmental or economic impacts. A scrap management program will be used to incorporate work practices to reduce SO_2. A scrap management plan may include the following elements:

- General scrap specifications;
- Verification of compliance with specifications (e.g., inspections); and

- Corrective actions for nonconforming scrap.

Step 5 – Selection of BACT

BACT Limit Overview

A review of the RBLC database revealed that other steel mills have an emission limit ranging from 0.10 lb SO_2/ton of steel to 1.76 lb SO_2/ton of steel. According to the RBLC, no other mills have successfully implemented any add-on controls. Typical SO_2 methods include scrap management, use of natural gas and low-sulfur feedstock, along with good management practices.

AM/NS proposes to utilize scrap management to minimize oil and no-add on control as BACT for SO_2 reduction from the proposed melt shops. AM/NS will meet an emission limit of 0.35 lb SO_2/ton of liquid steel. AM/NS proposes to demonstrate ongoing compliance with the emission limitations through the use of a performance testing, as well as recordkeeping and certification of compliance with scrap management plan.

1.2.1.5 New Melt Shops - EAFs, LMFs and Continuous Casters GHG BACT

CO_2 emissions from EAFs are generated primarily during the melting and refining processes, which remove carbon as CO and CO_2 from the charge materials and electrodes. Emissions of CO_2 are also generated from the use of oxy-fuel burners by EAF, ladle/tundish preheating activities, and RH preheating activities for EAF 1. As the hot waste gases leave the EAF, combustion air is introduced to the ductwork to convert the CO to CO_2, since CO is a regulated criteria pollutant. Because CO_2 is the primary GHG emitted, the following analysis focuses on CO_2 emissions, the primary GHG emitted.

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.[22] 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 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

22 https://archive.epa.gov/epa/climatechange/carbon-dioxide-capture-and-sequestration-overview.html

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 EAF 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 melt shops.

Carbon Capture

According to the Global CCS Institute[23], 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 AM/NS have similar exhaust characteristics, nor will any of the exhaust streams consist of pure CO_2. EAF 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 melt shops.

Carbon Storage

The small and large-scale CO_2 storage projects identified by National Energy Technology Laboratory,[24] 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

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23 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

24 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

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 EAFs.

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, AM/NS 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 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.[25] Despite these factors, an economic evaluation is shown in Table 1-6.

[25] 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

Table 1-6: CCS Economic Evaluation

	Post-Combustion CO_2 Capture	
Capital [1]	$105/ton	$171,794,987
	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)	$32,948,311
Labor	$341,627 + $1.85 x L x (343.2 x D^2 + 2074 x D + 170,013)	$97,446,828
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)	$9,518,880
	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	$1,851,665

	Geologic Storage Costs [2]	
Number of Injection Wells		1
Well Depth (m)		2,134
CO_2 Captured (tons)		1,473,483
	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	$492,143
	O&M	
Normal Daily Expenses	$11,566/Injection Well	$11,566
Consumables	$2,995/yr/ton CO_2/day	$12,090,632
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
	Annualized Cost Estimate	
Economic Life, years		20
Interest Rate (%)		7
Capital Costs		**$350,923,560**
O&M Costs (Annual)		$14,093,197
Capital Recovery		$33,124,700
Total Annualized Cost		**$47,217,897**

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 in Table 1-6, the estimated capital costs would be $350,923,560. 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 EAFs due to the exhaust characteristics, the extreme cost associated with CCS, the lack of commercial availability, the fluctuating demand for EOR, the lack of viable and proven storage options, and secondary environmental impacts, CCS is determined to be technically and economically infeasible for the proposed melt shops.

Energy Efficiency Measures

AM/NS has selected state-of-the-art EAFs for the New Melt Shops. The facility has also opted to implement additional energy efficiency measures which are discussed in more detail below.

- **Variable Speed Drives –** As flue gas flow varies over time, adjustable speed drives offer opportunities to operate dust collection fans in a more energy efficient manner. The electricity savings are estimated to be 15 kWh/ton steel, with a 67 percent decrease in total energy usage.
- **Oxy-Fuel Burners -** Oxy-Fuel Burners are used on most EAFs in the United States. These burners increase the effective capacity of the furnace by increasing the speed of the melt and reducing the consumption of electricity and electrode material, which reduces GHG emissions. Electricity savings range from 88 to 155 kWh/ft^3 oxygen injected. The use of oxy-fuel burners can lead to CO_2 emissions reductions of 23.5 kg CO_2/metric ton (47 lb/ton) of steel produced.
- **Bottom Stirring –** Bottom stirring is accomplished by injecting an inert gas into the bottom of the EAF to increase the heat transfer in the melt. The increased stirring can lead to electricity savings of 10 to 20 kWh/ton steel. Bottom Stirring can lead to CO_2 emissions reductions of 11.7 kg CO_2/ metric ton (23.4 lb/ton) of steel produced.
- **Foamy Slag –** Foamy slag covers the arc and melt surface to reduce radiation heat losses. Foamy slag can be obtained by injecting carbon and oxygen or by lancing of oxygen only. Slag foaming increases the electric power efficiency by at least 20 percent in spite of higher arc voltage. The net energy savings are estimated at 5 to 7 kWh/ton steel. Foamy slag use can lead to CO_2 emissions reductions of 10.6 kg CO_2/metric ton (12.2 lb/ton) of steel produced.

Although the LMF and Continuous Casting operations are not a significant source of GHG emissions, the following efficiency measures will be implemented.

- **Efficient Caster Ladle Heating** – Heat losses can occur through lack of lids and through radiation. AM/NS will reduce losses from casting by installing temperature controls, installing hoods and, by efficient ladle management (reducing the need for preheating). Efficient caster ladle heating can result in CO_2 emissions reductions of 0.55 lb/ton of steel product.

AM/NS proposes a numerical BACT limit of 826,889 tpy of CO_2e for EAF 1 and 810,413 tpy of CO_2e for EAF 2. A rolling 12-month basis is appropriate because there is no ambient air quality driver for reducing the averaging period for GHGs. Furthermore, due to the variability of the raw material properties, a lb/ton factor is not appropriate.

Step 5 – Selection of BACT

For CO_2e emissions generated from each New Melt Shop, BACT is selected to be the following energy efficiency measures as described in Step 4: variable speed drives, oxy-fuel burners, bottom stirring, foamy slag and efficient caster ladle heating. This is the only remaining technically feasible control options for minimizing CO_2e. No adverse energy, environmental, or economic impacts are associated with this control option. Compliance will be demonstrated through natural gas usage and production records. CO_2e from the each EAF 1 will be limited to 826,889 tpy and 810,413 tpy for EAF 2.

The EAF operations (charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations) which are controlled by the proposed melt shop baghouses will be limited to 1,929,043 tons/yr of liquid steel annual production for each EAF.

1.2.2 BACT Determination for Caster Spray Vents

Emissions generated during the casting process will be captured by the canopy hoods and vented to the corresponding melt shop baghouse for each caster. However, steam formed from the contact of cooling water with the hot steel will be captured by the caster steam exhaust system and vented through a designated Caster Spray Vent. Each Caster Spray Vent will emit PM, PM_{10}, and $PM_{2.5}$. The Caster Spray Vents will each have an exhaust flow rate of approximately 240,000 m^3/hr and an exhaust temperature of approximately 140°F.

1.2.2.1 Caster Spray Vents PM/PM_{10} /$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for PM/PM_{10}/$PM_{2.5}$ established for caster spray vents. It is important to note that the RBLC results represent limits for the casting process, not emissions entrained in steam from the cooling process. PM/PM_{10}/$PM_{2.5}$ emissions from the caster spray vents have characteristics similar to a cooling tower. For example, in the caster spray duct, particulate is contained within water droplets formed from the contact of water with hot steel and emitted to the atmosphere through the caster spray vent. Potentially applicable controls include: baghouses, wet scrubbers, ESPs, and mist eliminators. Control efficiencies for potentially applicable technologies are shown in the table below.

Table 1-7: Potential Control Devices for PM/PM_{10}/$PM_{2.5}$ from Two Caster Spray Vents

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency
Mist eliminator	70-99%
Good work practices	Varies
Fabric filter collector (baghouse)	95-99+% (As low as 0.001 gr/dscf)
ESP	95-99+% (0.002 – 0.004 gr/dscf)
Wet scrubber or high efficiency Venturi scrubber	70-99% (~0.01 gr/dscf)

A description of each of the control devices is previously included in Section 1.2.1.1, Step 1 except for mist eliminators and good work practices.

- ***Mist Eliminators***[26] **-** 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.
- ***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 Options

Baghouses

Baghouses are technically infeasible for this application because they are not designed for wet media and the resulting moisture/particulate combination would cause blinding of the bags.

Wet Scrubbers

As mentioned above, the caster spray vents are a source of PM, PM_{10}, and $PM_{2.5}$ emissions with principles similar to a cooling tower. Wet scrubbers and water sprays are technically inappropriate and infeasible for this application. Wet scrubbers are designed to control dry particulate by causing agglomeration of the particulate with the moisture particles, making them larger and subject to removal by physical means. In the caster spray duct, the particulate is already contained within the water droplets and physical agglomeration will not occur, reducing the scrubber's effectiveness considerably. The typical inlet concentrations for a wet scrubber range from 0.1 to 50 gr/scf, which is well above the concentration from the caster spray vents (0.003 gr/dscf). Wet scrubbers are not guaranteed to be capable of reducing PM/PM_{10}/$PM_{2.5}$ emissions below the concentration emitted from the caster spray vents. It is important to note that the particulate concentration from the caster spray vents is below the controlled concentration that a vendor would be able to guarantee. If a vendor is unable to guarantee a reduction in emissions, the emission rate controlled is essentially zero (0) tpy. There were no examples of a high efficiency wet scrubber applied to a caster spray vent in the RBLC. For these reasons, wet scrubbing is determined to be not technically feasible for reducing particulate emissions from the caster spray vents.

ESP/WESPs

ESPs are capable of 99% or higher particulate removal; however, several factors preclude their application to control PM/PM_{10}/$PM_{2.5}$ emissions from both caster spray vents. ESPs are not guaranteed to be capable of reducing PM/PM_{10}/$PM_{2.5}$ emissions below the concentration from caster spray vents. The typical inlet concentrations to an ESP or WESP are typically 0.5 gr/scf to 5 gr/scf; well above the PM/PM_{10}/$PM_{2.5}$ concentrations from the caster spray vents. Additionally, ESPs have high electricity demands, and require large amounts of maintenance, resulting in a relatively long periods of down time, compared to other control technologies.

The low inlet pollutant loading would result in significant technical hindrances for control by ESP/WESP. The uncontrolled particulate emission rate from the caster spray vents is around the concentration that a vendor would be able to guarantee, and a vendor would not be able to guarantee further reduction. Since a vendor cannot back a lower outlet concentration (no further removal), ESP/WESP control is not

26 Air Pollution Control Technology Fact Sheet: Fiber-Bed Scrubber, EPA-452/F-03-011, Washington, D.C.: Clean Air Technology Center, July 2003.

technically feasible or applicable to reduce emissions. Furthermore, there were no examples of an ESP/WESP applied to a caster spray vent in the RBLC. For these reasons, ESP/WESP is determined to be not technically feasible for reducing particulate emissions from the Caster Spray Vents.

Mist Eliminators

Mist eliminators are designed to control aerosols and fine or condensable particulate. Fiber bed mats are often sprayed with scrubbing liquid so particles can be collected by deposition on droplets and fiber bed mats. Waste gas streams are often cooled before entering fiber-bed filters to condense as much liquid as possible and to increase the size of the aerosol particles through condensation. The minimum inlet pollutant loading for a mist eliminator to be technically feasible is 0.1 gr/dscf, which is well above the concentration of each of the caster spray vents. Mist eliminators are not guaranteed to be capable of reducing $PM/PM_{10}/PM_{2.5}$ emissions below the concentrations found in the Caster Spray Vent exhaust streams. Mist eliminators are not applicable and are technically infeasible for controlling $PM/PM_{10}/PM_{2.5}$ emissions from the Caster Spray Vents.

Step 3 – Rank Remaining Technically Feasible Control Options

Good work practices are the only remaining feasible controls option.

Step 4 – Evaluate Remaining Control Technologies

The proposed numerical BACT limits from the two Caster Spray Vents are 6.5 mg/m^3 $PM/PM_{10}/PM_{2.5}$ (0.003 gr/dscf). Compliance with the numerical emissions limits will be based upon good work practices in order to minimize $PM/PM_{10}/PM_{2.5}$ emissions and impact to the surrounding area. No adverse economic or environmental impacts are associated with good work practices.

Step 5 – Selection of BACT

AM/NS proposes BACT to be the use of good work practices for control of $PM/PM_{10}/PM_{2.5}$ emissions from the caster spray vents. The proposed BACT emission limit for the caster spray vents is 6.5 mg/m^3 $PM/PM_{10}/PM_{2.5}$ (0.003 gr/dscf). AM/NS proposes to demonstrate ongoing compliance with the emission limitations through good work practices, including periodic inspections to ensure equipment is in proper working order.

1.2.3 BACT Determination for Degassing Operations

The degassing operations utilize oxygen injection to produce ultra-low carbon grades of steel. The oxygen blowing provides forced decarburization and chemical reheating, as required. The primary purpose of the degassing is to decarburize, desulfurize, and subsequently remove nitrogen. Sulfur will be retained in the slag and not emitted as SO_2. Process gasses from each degassing operation will be exhausted to a vent stack and controlled by a flare. Emissions of $PM/PM_{10}/PM_{2.5}$ and CO are generated from degassing operations and emissions from natural gas combustion will be generated by the degassing flares. AM/NS proposes to install 1 VTD Flare and 1 RH flare to control emissions of CO from the degassing operations. The RH degassing process design includes an additional oxy fuel-fired burner/lance for preheating. The flares will have a natural gas-fired pilot with a natural gas usage rate of 5,100 scf/hr and the RH degassing process will have an additional oxy fuel-fired burner with a natural gas usage rate of 10.35 MMBtu/hr.

1.2.3.1 Degassing Operations PM/PM_{10} /$PM_{2.5}$ and Lead BACT

Step 1 – Identify Potential Control Technologies

Particulate emissions, from the degassing operations result from utilizing oxygen injection to produce ultra-low carbon grades of steel and natural gas combustion emissions. As discussed in Section 1.2.1.1, natural gas contains a very small amount of noncombustible trace constituents that result in PM/ PM_{10}/ $PM_{2.5}$ emissions, including lead. The following technologies are potentially available control technologies for PM/PM_{10}/$PM_{2.5}$ and lead from the degassing operations. These control devices under consideration, except for vacuum system design and proper equipment maintenance would be downstream of degassing flare.

Table 1-8: Potential Control Devices for PM/PM_{10}/$PM_{2.5}$ from Degassing Operations

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ and Lead Control Efficiency
Fabric filter (baghouse)	95-99+% (As low as 0.001 gr/dscf)
ESP	95-99+% (0.002 – 0.004 gr/dscf)
Wet scrubber or high efficiency Venturi scrubber	70% to 99% (<0.01 gr/dscf)
Vacuum system design & proper equipment maintenance	99+%

Descriptions of these controls were previously discussed in Sections 1.2.1.1, Step 1.

Step 2 – Eliminate Technically Infeasible Options

Baghouses, Wet Scrubbing, ESPs

No examples have been found where a fabric filter, wet scrubber, or ESP has been applied to degassing operations prior to or after combustion (flare). There is one RBLC entry where “enclosure, capture, and fabric filter” is listed as the BACT control for a degassing operation at Nucor’s facility in Jewett, Leon County, Texas. However, upon further investigation, these particular vacuum tank degassers exhaust through the EAF baghouse and no control efficiency or numerical BACT limits were established for the source. The fortuitous presence of building evacuation to a baghouse in this example does not make baghouse controls technically feasible for vacuum tank degassers, especially because no numerical BACT limits were established for vacuum tank degassers with “fabric filter control.” As such, these add-on control technologies are not technically feasible for reducing PM/PM_{10}/$PM_{2.5}$ from the degassing operations.

Step 3 – Rank Remaining Technically Feasible Control Options

Good vacuum system design and proper equipment maintenance is the only remaining technically feasible control technology.

Step 4 – Evaluate Remaining Control Technologies

Since process emissions of PM/PM_{10}/$PM_{2.5}$ are low from each degassing operation (6.52E-04 lb/ton), add-on controls are not guaranteed to effectively reduce particulate concentrations and would be considerably cost prohibitive. The degassing flare system design performance is determined to be BACT for particulate control. The degassing flare system design performance will be met on an ongoing basis by performing proper equipment maintenance. Furthermore, the flares will use clean fuel (natural gas).

Step 5 – Selection of BACT

BACT Limit Overview

During the review of available control technologies for degassing operation systems at similar plants, no determinations were found for the use of add-on controls to reduce PM/PM_{10}/$PM_{2.5}$ emissions other than the control provided by the vacuum system.

AM/NS proposes BACT to be the good vacuum system design with proper maintenance to ensure performance. AM/NS proposes a numerical limit of 6.52E-04 lb/ton for $PM/PM_{10}/PM_{2.5}$ from the degassing operation. AM/NS proposes numerical to limit natural gas combustion emissions to 7.6 lb/MMscf for $PM/PM_{10}/PM_{2.5}$ and 5.00E-04 lb/MMscf for lead. The proposed degassing flares will be operated in compliance with 40 C.F.R. § 60.18 which outlines work practice standards for control devices. As per 40 C.F.R. § 60.18(c)(1): Flares shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. Compliance with BACT limits will be demonstrated through annual flare inspections and use of natural gas.

1.2.3.2 Degassing Operations NO_x BACT

Step 1 – Identify Potential Control Technologies

NO_x emissions result from natural gas combustion from the use of a flare for control of degassing operations. The following technologies are potentially available controls for NO_x emissions from natural gas fired flares.

Table 1-9: Potential Control Devices for NO_x from Degassing Flares

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 limits for Vacuum Tank Degassers and Flares contained in the RBLC range from 0.098 lb NO_x/MMBtu to 1.0 lb NO_x/MMBtu (approximately 100 lb NO_x/MMscf).

As such, AM/NS proposes BACT to be proper equipment design and operation, including the general control device and work practice requirements in 40 C.F.R § 60.18, with a numerical NO_x emissions limit of 100 lb/MMscf.

Step 5 – Selection of BACT

AM/NS will utilize proper equipment design and operation with a numerical emissions limit of 100 lb/MMscf as BACT for NO_x emissions from each of the degassing operation flares. Compliance with BACT limitations will be demonstrated through annual flare inspections.

1.2.3.3 Degassing Operations CO, VOC BACT

Step 1 – Identify Potential Control Technologies

The following technologies are potentially available control technologies for CO and VOC emission controls.

Table 1-10: Potential Control Devices for CO, VOC from Degassing Flares

Control Type	Estimated CO/VOC Control Efficiency
Thermal incinerator or oxidizer (afterburner)	98% -99+%
Recuperative thermal oxidizer	98% -99+%
Regenerative thermal oxidizer	95-99%
Flare	98+%
Enclosed Ground Flare	98% -99+%
Catalytic oxidizer	90-99%

With the exception of flares, descriptions of these controls were previously discussed in Section 1.2.1.3, Step 1.

- ***Flare***[27] **-** Flaring is a direct combustion control process that is used for the destruction of combustible gases. Flares are capable of achieving high levels of CO and VOC destruction if proper attention is paid to combustion process control.
- ***Enclosed Ground Flare –*** An enclosed ground flare is a type of flare that generally has less capacity than an open flare and is used to combust continuous, constant flow vent streams, although reliable and efficient operation can be attained over a wide range of design capacity. Enclosed, or ground-based flares are generally used instead of elevated flares for aesthetic or safety reasons. Certain specification including a high nozzle pressure drop and height must be adequate for use of an enclosed ground flare. Enclosed flares are typically used at landfills to destroy landfill gas.[26]

Step 2 – Eliminate Technically Infeasible Options

Thermal Oxidation, Regenerative Oxidation, Recuperative Oxidation, and Catalytic Oxidation

The exhaust stream from each of the degassers is highly combustible due to the CO concentration. It is hazardous to route the undiluted exhaust from each of the degassing operations to a thermal oxidizer, RTO, or catalytic oxidizer. Because the degasser exhaust cannot be routed directly to a thermal oxidizer, RTO, or catalytic oxidizer due to safety concerns, each of these add-on control devices are not technically feasible and are eliminated from further consideration.

Enclosed Ground Flare

Based on a review of the available data in the RBLC database, the use of an enclosed ground flare has not been proven in the industry and would not be ideal in design for the non-continuous degassing operations. As such the use of an enclosed ground flare is deemed technically infeasible.

Step 3 – Rank Remaining Technically Feasible Control Options

A flare is the only remaining technically feasible control option.

Step 4 – Evaluate Remaining Control Technologies

AM/NS proposes use of a flare, the only remaining technically feasible control, to reduce CO and VOC emissions as BACT.

Step 5 – Selection of BACT

BACT Limit Overview

According to RBLC inquiry results, flare control and equipment design and operation has been recently selected as BACT for several degassing operations, with CO numerical BACT limits of 0.075 lb/ton and VOC numerical BACT limits of 0.0054 lb/MMBtu (approximately 5.5 lb/MMscf).

AM/NS will utilize a flare to meet numerical emissions limits of 0.075 lb CO/ton[28] as BACT from the degassing process operations. Combustion emissions will be limited to 84 lb CO/MMscf and 5.5 lb VOC/MMscf. Compliance with BACT limitations will be demonstrated through annual flare inspections and use of natural gas.

1.2.3.4 Degassing Operations SO_2 BACT

SO_2 emissions result from the natural gas combustion from the use of a flare for control of degassing operations. The flare oxidizes sulfur compounds present in natural gas into SO_2. The control of SO_2 emissions is most directly associated with using a low sulfur fuel such as natural gas. Minimizing fuel

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27 Air Pollution Control Technology Fact Sheet: Flare, EPA-452/F-03-019, Washington, D.C.: Clean Air Technology Center, July 2003.

28 Based on 1.49 lb CO/ton and 95% destruction efficiency.

sulfur content through the use of low sulfur diesel fuels or natural gas has been determined to be BACT for many combustion processes, including flares.

Step 1 – Identify Potential Control Technologies

The following technologies are potentially available control technologies for SO_2 emission controls for natural gas combustion sources.

Table 1-11: Potential Control Devices for SO_2 from Degassing Flares

Control Type	Estimated SO_2 Control Efficiency
Flare gas recovery	Varies
Low sulfur fuel	Varies
Proper equipment design and operation	Base Case

SO_2 emissions can be controlled by the methods described below.

- ***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.
- ***Low Sulfur Fuel -*** SO_2 emissions occur from the oxidation of sulfur in the fuel during the combustion process. Therefore, SO_2 emissions can be controlled by limiting the sulfur content in the gas stream.
- ***Proper equipment design and operation -*** Utilization of source and industry accepted best management practices are an accepted method for administratively managing the emissions from combustion sources. 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. Proper equipment operation includes good combustion practices on each flare, which include maintaining the proper fuel heating value and discharge velocity.

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

Use of low sulfur fuel, coupled with proper equipment design and good combustion practices are selected as the top control option. No ranking is necessary because both remaining controls are selected as BACT.

Step 4 – Evaluate Remaining Control Technologies

SO_2 emissions from natural gas combustion can be best controlled when low sulfur gaseous fuels are completely combusted. EPA Publication AP-42, Chapter 13, states that the degree of combustion is primarily dependent upon the rate and extent of fuel-air mixing and on the flame temperature. Thus, the top control option is combusting low sulfur fuels coupled with proper equipment design and good combustion practices and is selected as BACT.

Step 5 – Selection of BACT

BACT Limit Overview

According to RBLC inquiry results, proper equipment design and operation has been recently selected as BACT for several degassing operations. BACT limits for Vacuum Tank Degassers and Flares contained in the RBLC are 6.0E-4 lb SO_2/MMBtu (approximately 0.6 lb SO_2/MMscf).

AM/NS proposes proper equipment design and operation, coupled with the use of natural gas (a low sulfur fuel) as BACT to minimize SO_2 combustion emissions from natural gas combustion associated with the degassing operations. Compliance with BACT limits will be demonstrated through annual flare inspections and use of natural gas.

1.2.3.5 Degassing Operations GHG BACT

CO_2e emissions from the proposed degassing operations with flare control will result from the combustion of natural gas and the combustion of feed gas. CO_2e emissions are directly correlated with the amount of feed gas burned; therefore, the smaller the volume of feed gas burned, the less CO_2e emissions generated.

Step 1 – Identify Potential Control Technologies

Potential control options are identified for CO_2 below.

- ***Good Management Practices –*** The degassing flares will be used for CO destruction and will convert CO to CO_2. Good combustion and maintenance practices are important components of good management practices to ensure full conversion of CO to CO_2 and to limit wasted energy.
- ***Energy Efficient Design –*** Energy efficient design includes achievement of high destruction efficiencies and compliance with 40 C.F.R. § 60.18.

Step 2 – Eliminate Technically Infeasible Options

Each of the identified control technologies are technically feasible.

Step 3 – Rank Remaining Technically Feasible Control Options

Both good management practices and good flare design are technically feasible options and are suggested as BACT, so there is no need to rank the control options.

Step 4 – Evaluate Remaining Control Technologies

Good Management Practices and Energy Efficient Design

Based on research conducted as part of this BACT analysis, the implementation of good management practices and proper flare design can be achieved by following the guidance of 40 C.F.R. § 60.18.

Step 5 – Selection of BACT

Good management practices and energy efficient design will be employed by following the guidance of 40 C.F.R. § 60.18.

The degassing operations will have a combined steel throughput limit of 3,858,085 tons/yr (3,500,000 metric tons per year) of liquid steel.

1.2.4 BACT Determination for Ladle/Tundish and RH Preheaters

AM/NS will operate Ladle/Tundish Preheaters in conjunction with New Melt Shop Operations as well as preheating stations associated with the RH degassing operation. Each of the preheaters will be equipped with small natural gas-fired burners, less than 15 MMBtu/hr. The emissions from these preheating activities will be routed to the melt shop baghouses.

Natural gas combustion in the units will result in emissions of PM/ PM_{10}/ $PM_{2.5}$, NO_x, CO, SO_2, VOC, lead and GHGs. A BACT analysis for each of the criteria pollutants and lead is included in the following sub-sections.

1.2.4.1 Ladle/Tundish and RH Preheaters PM/PM_{10}/$PM_{2.5}$ BACT

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, including lead. The following technologies are potentially available control technologies for PM/PM_{10}/$PM_{2.5}$ and lead emission controls for natural gas-fired combustion sources.

Table 1-12: Potential Control Devices for PM/PM_{10}/$PM_{2.5}$ and Lead from Preheating Activities

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ and Lead 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

With the exception of clean fuel and good combustion practices, descriptions of these controls were previously discussed in Section 1.2.1.

- ***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 with trace amounts of lead 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 preheater unit due to the reduced volume and minimal particulate concentration of the associated exhaust gas stream. Therefore, baghouse technology is not technically feasible for the natural gas-fired preheating activities. Although, emissions from the preheating activities will be routed to the New Melt Shop Baghouses, the baghouses are not expected to reduce $PM/PM_{10}/PM_{2.5}$ and lead emissions from natural gas combustion because the concentration of these pollutants will be far below the guaranteed outlet concentration of each baghouse and will consist mostly of condensable particulate. The amount of particulate collected in the hoods from these sources is expected to be negligible; thus, a baghouse is not "technically feasible" for $PM/PM_{10}/PM_{2.5}$ and lead reduction from these small natural gas-fired sources.

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 and lead 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 preheaters will be a result of natural gas combustion and are less than 1 micrometer. Therefore, wet scrubber technology is not technically feasible for the preheating.

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 preheater or dryer due to the reduced volume and minimal particulate and lead concentrations of the associated exhaust gas stream. Therefore, ESP is not technically feasible for the preheating activities.

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 $PM/PM_{10}/PM_{2.5}$ and lead 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, including lead, from small natural gas-fired preheater equipment. Therefore, AM/NS considers BACT for these remaining small combustion sources to be the use of natural gas, a clean-burning fuel with low $PM/PM_{10}/PM_{2.5}$ and lead emissions, and good combustion practices. Use of natural gas and good combustion practices are applicable, economical, and will be employed for the preheating activities. 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 $PM/PM_{10}/PM_{2.5}$, including lead compounds, are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for $PM/PM_{10}/PM_{2.5}$ and lead 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}/$PM_{2.5}$ and lead limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel.

AM/NS 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), 7.6 lb/MMscf PM_{10}/$PM_{2.5}$, and 0.0005 lb lead/MMscf as BACT for the preheating activities. 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.

1.2.4.2 Ladle/Tundish and RH Preheaters NO_x BACT

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 1-13: Potential Control Devices for NO_x From Preheating Activities

Control Type	Estimated NOx Control Efficiency
SCR	70% -90%
NSCR	80% -90%
SNCR	40% -75%
Low-NO_x burners	40% -85%

Potential NO_x control technologies are previously discussed in Section 1.2.1.2, Step 1.

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 preheating activities due to the specific design requirements for each preheater and its respective unit. For example, the unit that is preheated needs to fit around the preheater (e.g., ladles) or the preheater is directly fired and the flame contacts the unit surface. In each scenario, 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 preheating activities (approximately 3-4%) 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 has been applied to a small natural gas burner. There is no appropriate temperature zone for SNCR application to the preheating activities. 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 dryers and preheaters. Low-NO_x burners and good combustion practices were recently selected as BACT for small natural gas-fired preheaters.

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 preheating activities. LNBs will be installed to meet 60 ppmvd at 3% O_2 (0.07 lb/MMBtu, 70 lb/MMscf) 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. 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 60 ppmv at 3% O_2 (0.07 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.

AM/NS will use low-NO_x burners with a numerical NO_x emission limit of 60 ppmvd at 3% O_2 (0.07 lb/MMBtu, 70 lb/MMscf) from the preheating activities.

1.2.4.3 Ladle/Tundish and RH Preheaters CO, VOC BACT

Step 1 – Identify Potential Control Technologies

CO and VOC emissions from combustion result from incomplete combustion caused when some of the fuel is not completely burned or is only partially burned. The most stringent control technology used to control CO emissions from combustion is catalytic oxidation, and these catalytic oxidation systems are also used to reduce VOC emissions. The following technologies are potentially available control technologies for CO and VOC emission controls for natural gas combustion sources.

Table 1-14: Potential Control Devices for CO, VOC from Preheating Activities

Control Type	Estimated CO/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

Except for clean fuel and good combustion practices, descriptions of these controls were previously discussed in Section 1.2.1.3.

- ***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 and CO 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 CO and 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, CO and 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).

Catalytic Oxidizer

Catalytic oxidation is a post-combustion control technology that utilizes a catalyst to oxidize CO and 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 CO and 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 CO and 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 CO and VOC emissions from small natural gas-fired equipment. Therefore, AM/NS proposes that BACT for CO and VOC emissions from combustion sources be limited to the use of natural gas (a clean-burning fuel with low CO and VOC emissions), good combustion practices, and numerical emissions limits of 84 lb CO/MMscf and 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 CO and VOC are achieved by use of clean fuel (natural gas) and good combustion practices. Emission factors for CO and 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 CO and VOC limits from small natural gas combustion sources is demonstrated through the use of natural gas fuel and certification of good combustion practices.

AM/NS will utilize clean fuel (natural gas) and good combustion practices, and numerical emissions limits of 84 lb CO/MMscf and 5.5 lb VOC/MMscf natural gas as BACT for CO and VOC emissions from the preheating activities. 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.

1.2.4.4 Ladle/Tundish and RH Preheaters SO_2 BACT

The preheaters oxidize the trace amount of sulfur present in natural gas into SO_2. The control of SO_2 emissions is most directly associated with using a low sulfur fuel such as natural gas. Potential SO_2 emissions are directly related to the sulfur content of fuels. Minimizing fuel sulfur content through the use of low sulfur diesel fuels or natural gas has been determined to be BACT for many combustion processes, including preheaters.

Step 1 – Identify Potential Control Technologies

The following technologies are potentially available control technologies for SO_2 emission controls for natural gas combustion sources.

Table 1-15: Potential Control Devices for SO_2 from Preheating Activities

Control Type	Estimated SO_2 Control Efficiency
Wet Scrubber	90-99+%
Ceramic catalytic filter (baghouse) with integrated dry sorbent injection	>90%

Baghouse with semi-dry sorbent injection	70-99+%
Baghouse with dry sorbent injection	60-70%
Clean Fuel And Good Combustion Practices	Base Case

Control technologies for SO_2 and acid gases include the following types of flue gas desulfurization (FGD) controls. In general, FGD systems remove SO_2 from exhaust streams by using an alkaline reagent to form sulfite and sulfate salts. The reaction of SO_2 with the alkaline chemical can be performed using either a wet or dry contact system as described below. Wet Scrubbers are described in Section 1.2.1.4, Step 1.

- ***Ceramic Catalytic Filter (Baghouse)*** - The ceramic catalytic filter (baghouse) technology (such as Tri-Mer Corporation's UltraCat Catalyst filters) removes acid gases with integrated dry sorbent injection of sodium bicarbonate, trona, or lime. For controlling SO_2, the Tri-Mer filter systems provide an option for using dry injection of calcium or sodium-based sorbents. The chemical reaction of the sorbent with the acid gas creates a solid particle that is captured on the ceramic filters along with unreacted sorbent and other particulates.
- ***Fabric Filter (or Baghouse), with Semi-Dry Sorbent Injection or Dry Sorbent Injection*** – A fabric filter (or baghouse) is one of the most efficient means of separating particulates from a gas stream. The advantage of fabric filters is that efficiency is largely insensitive to the physical characteristics of the gas stream and changes in the dust loading. Baghouse installations are an industry standard for particulate controls and can also be used with alkali salts to remove SO_2 and acid gases. In a semi-dry system, a liquid reagent (or slurry) is sprayed into the gas stream to react with the SO_2 and acid gases. The reaction products are collected on the fabric filters.

In the dry process, fine particles of a sorbent (such as hydrated lime or sodium bicarbonate) are injected into the flue gas stream to remove acid gases by surface reactions. Because it is a surface reaction technology, the dry/dry system has a much higher reagent (sorbent) requirement than the liquid semi-dry system. In order to reduce the sorbent requirements, these systems typically recycle most of the baghouse collection into the feed system, in order to promote better sorbent utilization.

Step 2 – Eliminate Technically Infeasible Options

For relatively small natural gas-fired sources, post-combustion controls, such as wet scrubbers, ceramic catalytic filters, and fabric filters with Dry or Semi-Dry Sorbent Injection are technically infeasible and impractical due to the relatively small quantities of SO_2 present in the exhaust gas. Furthermore, there were no examples available in the RBLC of these control devices being applied to small, natural gas-fired combustion sources.

Step 3 – Rank Remaining Technically Feasible Control Options

Clean Fuel (Natural Gas) and Good Combustion Practices are the only remaining technically feasible control.

Step 4 – Evaluate Remaining Control Technologies

AM/NS proposes that BACT for SO_2 emissions from combustion sources be limited to the use of natural gas (a clean-burning fuel with low sulfur content) and good combustion practices.

Step 5 – Selection of BACT

BACT Limit Overview

Add-on controls, even if feasible, are not typically required for combustion sources fired with natural gas. 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 SO_2 emissions from natural gas-fired equipment.

AM/NS proposes the use of natural gas (a low sulfur fuel) and good combustion practices as BACT for the natural gas-fired preheating activities. Compliance will be demonstrated through natural gas usage records. Good combustion practices include:

- Burning pipeline quality natural gas only.
- Implementing good operation and maintenance practices, including good burner maintenance and operation.

1.2.4.5 Ladle/Tundish and RH Preheaters GHG BACT

CO_2e emissions from the proposed preheating activities 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. Each of the identified GHG (CO_2) control technologies and practices are discussed in Section 1.2.1.5.

- Carbon Capture and Sequestration
- Energy Efficient Design

Step 2 – Eliminate Technically Infeasible Options

Carbon Capture and Sequestration

For the reasons previously identified in Section 1.2.1.5, Carbon Capture and Sequestration is not a technically feasible control technology.

Step 3 – Rank Remaining Technically Feasible Control Options

Energy efficient design is 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 preheating activities, 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 preheating activities will be limited to 55,272 tpy for EAF 1 and 38,796 tpy for EAF 2, based on the default emission factors from 40 CFR Part 98 Subpart C, Tables C-1 and C-2 for natural gas.

1.2.5 BACT Determination for Material Handling and Storage

AM/NS is proposing to install a series of material transfer stations, conveyor systems, raw material storage piles and storage silos to support processes in the New Melt Shops. Storage bins will feed the conveyors that will transfer charging materials and alloys to the EAF and LMF. PM/PM_{10}/$PM_{2.5}$ emissions from the material handling system will be captured by a series of dust collector hoods and routed to each New Melt Shop Baghouse. Wet suppression will be utilized to reduce PM/PM_{10}/$PM_{2.5}$ emissions from raw material storage piles. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions. This section evaluates BACT for the material handling systems, raw material storage piles, storage silos and EAF/LMF Feed System.

1.2.5.1 Material Handling and Storage PM/PM_{10}/$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Control efficiencies for potentially applicable technologies are shown in the table below.

Table 1-16: Potential Control Devices for PM/PM_{10}/$PM_{2.5}$ from Material Handling and Storage

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency
Enclosed conveyors and transfer stations	Varies
Water Sprays Or Wet Suppression	Varies
Fabric Filter (Baghouse or Bin Vent Filter)	Up to 99.9% (As low as 0.001 gr/dscf)
Good Housekeeping Practices	Base case

Fabric Filter are discussed in detail in Section 1.2.1.1, Step 1.

- ***Enclosed Conveyors and Transfer Stations*** - Enclosed conveyor systems prevent airflow from lifting dust from raw materials as they are moved on a conveyor belt. Similarly, enclosed transfer stations work to isolate material drop points between conveyors from the surrounding conditions. Enclosed transfer stations are typically designed with minimized material drop heights to reduce dust generated by materials being transferred. Enclosed conveyors are frequently used when conveyor systems are designed for dry materials.
- ***Water Sprays or 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 Housekeeping Practices*** – Good housekeeping practices are used in areas where it is difficult to feasibly implement other control technologies. Good housekeeping practices generally consist of activities such as keeping areas free of dust by cleaning or sweeping.

Step 2 – Eliminate Technically Infeasible Options

Water Sprays or Wet Suppression

Water sprays or wet suppression are not suitable for control of the alloy, flux, and carbon transfer and conveying emissions because the systems for material handling, transfer, and storage are designed for dry materials. Wet materials may clog equipment and create additional wear. However, wet suppression can be used to control emissions from other raw material storage piles.

Step 3 – Rank Remaining Technically Feasible Control Options

1. Fabric Filter (Baghouse or Bin Vent Filter)
2. Wet Suppression (Storage Piles)
3. Enclosed Conveyors and Transfer Stations
4. Good Housekeeping Practices

Step 4 – Evaluate Remaining Control Technologies

Fabric Filter (Baghouse or Bin Vent)

The most efficient and effective control devices for filterable PM/PM_{10}/$PM_{2.5}$ emissions from material handling, storage, and transfer are fabric filters. Each New Melt Shop Baghouse will be used to reduce particulate emissions from the new dust sources, except for the silos which will be controlled by bin vent filters. Hoods will be implemented to collect airborne material from indoor process areas, material handling transfer points, and dust-generating operations are routed to the respective New Melt Shop Baghouse to control PM/PM_{10}/$PM_{2.5}$ emissions.

Enclosed Conveyors and Transfer Stations

Enclosed conveyors and transfer stations will be used as appropriate, as well as using indoor conveyors, when possible. Because the conveyors and transfer stations will be enclosed/indoors, drop heights will be low to minimize dusting. Emissions generated from material transfers will be collected by local hoods and routed to the New Melt Shop Baghouses.

Water Sprays or Wet Suppression

Water sprays or wet suppression will be used as appropriate, for the control of dust from the raw material storage piles.

Good Housekeeping Practices

Good housekeeping practices such as periodically cleaning work areas and equipment, and sweeping floors to remove dust can be effective as a base control for particulate emissions from material handling and transfer operations.

The most efficient and effective control of filterable PM/PM_{10}/$PM_{2.5}$ emissions for the material handling systems, and EAF/LMF Feed System is a combination of a baghouse filters, silo bin vent filters, enclosed/indoor conveyors and transfer stations, and good housekeeping practices. No other control procedures are applicable.

Step 5 – Selection of BACT

BACT Limit Overview

RBLC search results for PM/PM_{10}/$PM_{2.5}$ BACT emission limits for material storage units, such as lime and carbon silos, at steel mills indicate that the typical BACT the emission rate established is 0.005 gr/dscf to 0.01 gr/dscf. The RBLC also indicates that the typical BACT emission rate established by material handling systems controlled by melt shop baghouses can be in the range of 0.0015 gr/dscf to 0.0018 gr/dscf.

A combination of a fabric filters and enclosure for conveyors and transfer stations along with good housekeeping practices, will represent BACT for controlling PM, PM_{10} and $PM_{2.5}$ emissions from the material handling systems, and EAF/LMF Feed System. Numerical emission limits for the material handling systems, and EAF/LMF Feed System are proposed to be 0.0018 gr/dscf for PM_{10}/PM_{10}/$PM_{2.5}$ (filterable). Numerical emission limits for the raw material storage are proposed to be 30.57 tpy for total

PM, 14.46 tpy for PM_{10} and 3.18 tpy for $PM_{2.5}$. Numerical emission limits for each of the storage silos are proposed to be 0.005 gr/dscf PM_{10}/PM_{10}/$PM_{2.5}$ (filterable).

1.3 BACT DETERMINATION FOR SUPPORTING EQUIPMENT AND OPERATIONS

1.3.1 BACT Determination for Cooling Tower

This section evaluates BACT for the new contact-cooling tower being proposed by this project.

Cooling Tower

Due to additional cooling water demand for the new melt shops, one (1) new contact cooling water tower (cooling tower) will be installed to manage and recycle contact water during casting operations. The cooling tower will emit PM/PM_{10}/$PM_{2.5}$. The cooling tower will have a 0.001% drift rate.

1.3.1.1 Cooling Tower PM/PM_{10}/$PM_{2.5}$ BACT

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.

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 1-17: Potential Control Devices for PM_{10}/$PM_{2.5}$ from New 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 0.001% 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 0.001% is BACT for PM/PM_{10}/$PM_{2.5}$ emissions from a cooling tower.

Use of High Efficiency Drift Eliminators

A drift loss of 0.001% 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).

AM/NS proposes to use a cooling tower equipped with high-efficiency drift eliminators that will achieve a drift rate of 0.001%, which is the most effective technique to reduce PM/PM_{10}/$PM_{2.5}$ emissions. Compliance will be demonstrated by drift eliminator vendor specifications.

1.3.2 BACT Determination for Slag Handling

AM/NS is proposing to install a slag handling operation that includes the storage, handling, and sizing of slag. The system will be located outside of the melt shop. The sizing operation will be a damp process. Water will be utilized to minimize dust and smoke. The process has the potential to release PM/PM_{10}/$PM_{2.5}$ emissions in the form of dust and smoke. Slag will be stored in stockpiles.

1.3.2.1 Slag Handling $PM/PM_{10}/PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Controls for PM include baghouses (fabric filters), water sprays or wet suppression, enclosed conveyor and transfer stations (including indoor operations), and good housekeeping practices. Control efficiencies for potentially applicable technologies are shown in the table below.

Table 1-18: Potential Control Devices for $PM/PM_{10}/PM_{2.5}$ from Slag Handling

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ Control Efficiency
Baghouses/Filters	Up to 99.9% (As low as 0.001 gr/dscf)
Water sprays or wet suppression	Varies[29]
Good housekeeping practices	Base case

Fabric Filter are discussed in detail in section 1.2.1.1, Step 1. The remaining control devices are discussed in section 1.2.5.1, Step 1.

Step 2 – Eliminate Technically Infeasible Options

Baghouses

The slag handling operation is a damp process. Water is added during the crushing and grinding to suppress dust and smoke. Baghouse controls and/or fabric filters are technically infeasible for this application because they are not designed for use in a moist environment. The moisture would cause blinding and plugging of the bags. In addition, the emissions from the slag handling operation are fugitive in nature and thus cannot be effectively captured and controlled.

Step 3 – Rank Remaining Technically Feasible Control Options

1. Water sprays or wet suppression
2. Good housekeeping practices

Step 4 – Evaluate Remaining Control Technologies

Water sprays or wet suppression

Water sprays are frequently employed at specific dust-generating points where dry materials are dropped or transferred. Water sprays are very effective at controlling dusts by weighing down the dust particles. Wet suppression acts to prevent dust generation through the wetting of materials, and to settle dust more quickly by wetting the particles in air. Fugitive emissions from slag handling and stockpiling will be minimized via wet suppression.

Good Housekeeping Practices

Good housekeeping practices such as periodically cleaning work areas and equipment, and sweeping floors to remove dust can be effective as a base control for particulate emissions from material handling and transfer operations.

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[29] 1.5% moisture minimum results in 50% reduction according to Texas Commission of Environmental Quality's Current BACT Guidelines, updated January 2013. According to emissions factor from AP-42, section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing (August 2004), slag crushing noted as controlled are assumed to utilize wet suppression and results in approximately 78% reduction.

The most efficient and effective control of filterable PM/PM_{10}/$PM_{2.5}$ emissions for the slag handling operation is a combination of a wet sprays or wet suppression and good housekeeping practices. No other control procedures are applicable.

Step 5 – Selection of BACT

BACT Overview

RBLC search results for PM/PM_{10}/$PM_{2.5}$ BACT emission limits for slag handling operation that includes the sorting, crushing, and grinding of slag, at steel mills indicate that the typical BACT emission rate established is 0.0007 lb PM (total PM) /ton of material handled to 0.18 lb PM (total PM)/ ton of material handled. The lower limit of the range, 0.0007 lb/ton, is for an air-cooled slag processing secondary crusher at Nucor Steel Louisiana and was established in May 2010. Nucor Steel Louisiana also has an air-cooled slag processing primary crusher with an emission limit of 0.005857 lb/ton. Wet suppression was the selected control technology for particulate emissions from both the primary and secondary air-cooled slag crushers, and this technology is inherent to the granulated slag process. However, Nucor Steel Louisiana never constructed the aforementioned equipment, and thus never demonstrated compliance with these extremely low limits. Because the lowest numerical limits have not been proven, they can be eliminated. After eliminating these results, the RBLC search results support a BACT limit of 0.0005 lb/ton of material handled for PM_{10} and $PM_{2.5}$.

Proposed BACT for controlling the PM, PM_{10} and $PM_{2.5}$ from the slag handling operations is a combination of wet suppression and good housekeeping practices. Numerical emission limits for the slag processing operation are proposed to be 0.0012 lb/ton for PM, 0.00054 lb/ton for PM_{10}, and 0.0001 lb/ton for $PM_{2.5}$. Numerical emission limits for the slag storage are proposed to be 6.02 tpy for total PM, 2.85 tpy for PM_{10} and 1.05 tpy for $PM_{2.5}$.

1.3.3 BACT Determination for Scarfing Operations

AM/NS is proposing to install a scarfing operation in order to support Melt Shop Operations. Scarfing is performed in order to remove surface material from the cast slab and improve the surface quality of the finished steel sheet. The cooled slabs will be loaded onto a rolling table using a crane. The slab is transported via rollers to the aligning table to be adjusted before being automatically fed through the scarfing machine. The scarfing process involves the slabs being torched on two sides at a time. The torching accomplishes the removal of surface materials by causing these materials to undergo a thermochemical exothermic reaction of oxygen and fuel gas. Once the slab passes through the scarfing machine, it is flipped and sent back through in order to torch the remaining two sides.

Emissions generated during the scarfing process will primarily include PM, PM_{10}, and $PM_{2.5}$ and will be controlled by an ESP. The ESP will have an exhaust flow rate of approximately 280,000 m^3/hr and an exhaust temperature of approximately 140°F.

Due to the torching component of scarfing, natural gas combustion will take place. The concentrations of lead, CO, and VOC emissions is well below the threshold where add-on controls are applicable, and the addition of control devices cannot be cost effective for BACT. Furthermore, low-NO_x burner technology is not available for these small torches. SO_2 will be minimized through the use of low-sulfur gaseous fuel. CCS is not available for capturing CO_2 emissions from torches. CO emissions will be limited to 84 lb/MMscf and VOC emissions will be limited to 5.5 lb/MMscf. NO_x emissions will be limited to 100 lb/MMscf through the equipment design and SO_2 will be minimized through the use of gaseous fuel. GHG as CO_2e emissions will minimal.

1.3.3.1 Scarfing Operations PM/PM_{10} /$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for $PM/PM_{10}/PM_{2.5}$ established for scarfing operations. Potentially applicable controls include: baghouses, ESPs, wet scrubbers, high efficiency cyclones and mist eliminators. Control efficiencies for potentially applicable technologies are shown in the table below.

Table 1-19: Potential Control Devices for $PM/PM_{10}/PM_{2.5}$ from Scarfing Operations

Control Type	Estimated $PM/PM_{10}/PM_{2.5}$ Control Efficiency
Fabric filter collector (baghouse)	95-99+% (As low as 0.001 gr/dscf)
ESP	95-99+% (0.002 – 0.004 gr/dscf)
Wet scrubber or high efficiency Venturi scrubber	70-99% (~0.01 gr/dscf)
High efficiency cyclone	80-99% for PM, 30-90% for PM_{10}, 0-40% for $PM_{2.5}$ (>0.01 gr/dscf)
Mist eliminator	70-99%

A description of the first four control devices is previously included in Section 1.2.1.1, Step 1. The remaining options are described in Section 1.2.2.1, Step 1.

Step 2 – Eliminate Technically Infeasible Options

Baghouses

Baghouses are technically infeasible for this application because they are not designed for wet media and the resulting moisture/particulate combination would cause blinding of the bags.

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, including lead compounds for this operation. 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.

Mist Eliminators

Mist eliminators are used to collect fine and/or soluble particulate matter or liquid aerosols. Emissions from scarfing operations are dry and therefore do not include any liquid aerosols. Insoluble and/or coarse PM will clog the fiber bed with time. As such, mist eliminators are considered technically infeasible for controlling $PM/PM_{10}/PM_{2.5}$ emissions from the scarfing operations.

Step 3 – Rank Remaining Technically Feasible Control Options

The PM/PM_{10}/$PM_{2.5}$ control technologies for scarfing operations are:

1. ESP, 95-99+% (0.002 – 0.004 gr/dscf)
2. Wet Scrubber, 70% – 99% (~ 0.01 gr/dscf)

Step 4 – Evaluate Remaining Control Technologies

The search results from an RBLC review of scarfing operation BACT emission limits reveal that the most stringent limits for PM/PM_{10}/$PM_{2.5}$ are achieved by baghouse control. It is important to note, however, that the RBLC review yielded only two results for scarfing. The most recent BACT emission limits for scarfing in the RBLC were established in September 2017 for scarfing operations controlled by baghouses at AK Steel Corporation located in Dearborn, Michigan. These recent numerical BACT limits were established to be 0.005 gr/dscf for total $PM_{2.5}$ and 0.005 gr/dscf for total PM_{10}. There is not expected to be a large particle size distribution between PM_{10} and $PM_{2.5}$ and a majority of the particulate is comprised of condensable matter (all condensable matter is $PM_{2.5}$), and due to the large makeup of condensable matter, it is not necessary to have different limits for PM_{10} and $PM_{2.5}$ total.

ESP/WESPs

The EPA lists the metallurgical industry for a typical application of ESPs. Although only baghouses appear in the RBLC search results, it is important to note that these results are not considered to be a robust source of control equipment. The only two scarfing results are from the same plant. Because ESPs can reach efficiencies as high as baghouses (95% – 99+%), which are technically infeasible for this project, AM/NS proposes to control emissions from scarfing operations with an ESP.

Wet Scrubber or High Efficiency Venturi Scrubber

High energy scrubbers have disadvantages compared to ESPs. 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 ESPs.

Based on RBLC results and vendor provided data, AM/NS is proposing BACT to be 0.01 gr/dcsf (30 mg/m3) for total $PM_{2.5}$ emissions and 0.01 gr/dcsf (30 mg/m3) for total PM_{10} emissions from the scarfing operation ESP.

Step 5 – Selection of BACT

AM/NS proposes BACT to be the control of PM/PM_{10}/$PM_{2.5}$ emissions from the scarfing operations using an ESP. The proposed BACT emission limit for the scarfing operation ESP is 0.01 gr/dcsf (30 mg/m3). AM/NS proposes to demonstrate ongoing compliance with the emission limitations through good work practices, including periodic inspections to ensure equipment is in proper working order and the monitoring of ESP voltages indicative of proper performance.

The scarfing operations which will be controlled by the proposed ESP will be limited to an annual slab throughput of 1,337,888 tons/yr.

1.3.4 BACT Determination for Torch Cutting and Slab Cutting Operations

AM/NS is proposing to perform torch cutting and slab cutting operations. Gas-fired torches will be used to cut large scrap into manageable sizes. Gas torches will also be used to cut casted slabs. Based on the amount of emissions generated from this operation, it is expected for this to be classified as an Insignificant Activity in accordance with AAC 335-3-16-.01(o).

1.3.4.1 Torch and Slab Cutting PM/PM_{10}/$PM_{2.5}$, lead, CO, VOC, NO_x, SO_2, GHG BACT

The concentrations of PM/PM_{10}/$PM_{2.5}$, lead, CO, and VOC emissions is well below the threshold where add-on controls are applicable, and the addition of control devices cannot be cost effective for BACT. Furthermore, low-NO_x burner technology is not available for these small cutting torches. SO_2 will be minimized through the use of low-sulfur gaseous fuel. CCS is not available for capturing CO_2 emissions from cutting torches. PM, PM_{10}, and $PM_{2.5}$ emissions from these activities are very small and will be limited to 7.6 lb/MMscf through the use of good work practices. CO emissions will be limited to 84 lb/MMscf and VOC emissions will be limited to 5.5 lb/MMscf. NO_x emissions will be limited to 100 lb/MMscf through the equipment design and SO_2 will be minimized through the use of gaseous fuel. GHG as CO_2e emissions will minimal.

1.3.5 BACT Determination for Road Dust from Truck Traffic

As part of the proposed project, there will be emissions from road dust due to increased traffic to existing roadways. This includes increased traffic on both paved and unpaved roads.

1.3.5.1 Road Dust from Truck Traffic PM/PM_{10} /$PM_{2.5}$ BACT

Particulate emissions occur whenever vehicles travel over a paved surface such as a road or parking lot. Particulate emissions from paved roads are due to direct emissions from vehicles in the form of exhaust, brake wear and tire wear emissions and resuspension of loose material on the road surface.[30]

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface.[31]

BACT Baseline for PM, PM_{10}, and $PM_{2.5}$ for Road Dust from Truck Traffic

Per AAC 335-3-4-.02 precautions shall be taken to prevent particulate matter from becoming airborne. Such reasonable precautions include the application of water or chemicals for control of dust on dirt roads.

Step 1 – Identify Potential Control Technologies

Table 1-20: Potential Control Technology for PM from Truck Traffic

Control Type	Estimated PM/PM_{10}/$PM_{2.5}$ Control Efficiency
Wet Suppression/Surface Improvements	Varies (approximately 80%)
Good Housekeeping Practices	Varies

- ***Wet Suppression/Surface Improvements*** – Surface treatments for unpaved roads include wet suppression. Wet suppression allows for water or chemicals to be applied to unpaved roads to minimize emissions from. Surface improvements include paving an unpaved road or covering the

30 AP-42 Chapter 13.2.1 – Paved Roads (January 2011). https://www.epa.gov/sites/production/files/2020-10/documents/13.2.1_paved_roads.pdf

31 AP-42 Chapter 13.2.2 – Unpaved Roads (November 2006). https://www.epa.gov/sites/production/files/2020-10/documents/13.2.2_unpaved_roads.pdf

road with a material that possesses a lower silt content. A lower silt content will allow for a reduction in the amount of airborne dust.

- ***Good Housekeeping Practices*** – Good housekeeping practices include posting speed limits which are enforced by the facility for trucks and vehicles to prevent loose materials from becoming airborne during transportation. Good housekeeping practices also include periodically sweeping paved roadways to remove dust and loose materials.

Step 2 – Eliminate Technically Infeasible Options

The potential controls identified are technically feasible.

Step 3 – Rank Remaining Technically Feasible Control Options by Control Effectiveness

Based on the results from the RBLC database and relevant USEPA guidance, the control options listed in Step 1 are ranked as follows:

1. Wet Suppression/Surface Improvements
2. Good Housekeeping Practices

Step 4 – Evaluating Remaining Control Technologies

Wet Suppression/Surface Improvements

The top control technology for $PM/PM_{10}/PM_{2.5}$ from Truck Traffic is the use of wet suppression. Wet suppression applies water or chemicals to unpaved roads to reduce dust emissions. The wetted particulate becomes heavier thus reducing airborne dust as vehicles travel over the road surface. Vehicles will also travel on paved roads to help suppress dust emissions.

Good Housekeeping Practices

Good Housekeeping practices will be implemented which include posting and enforcing speed limits to prevent loose materials from becoming airborne during transportation. Paved roadways will be periodically swept to remove dust and loose materials.

Step 5 – Select BACT

BACT for road dust from increased truck traffic will be utilizing wet suppression methods and implementing good housekeeping practices as discussed above for controlling $PM/PM_{10}/PM_{2.5}$ emissions. $PM/PM_{10}/PM_{2.5}$ emissions will be limited to 37.40 tpy, 6.49 tpy, and 1.44 tpy respectively. Compliance will be demonstrated through recordkeeping.

1.3.6 BACT Determination for the Emergency Diesel Generators

The proposed facility will include three new 2,700 kilowatt (kW) emergency diesel generators, two new 2,000 kW emergency diesel generators, and two new 250 kW emergency diesel generators 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 for 100 hours per year for maintenance and readiness testing. The emergency diesel generators will combust diesel fuel and have emissions of PM, PM_{10}, $PM_{2.5}$, CO, NO_X, SO_2, 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}, $PM_{2.5}$, CO, NO_x, SO_2, 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."[32] 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.[33] 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.[34]

In accordance with 40 CFR 60.4202(a) and (b), the proposed emergency diesel generators with a power rating of 2,700 kW and 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 generators 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.

Table 1-21: BACT Limits for Emergency Engines

Source	Non-methane hydrocarbon (NMHC) + NO_X (g/kW-hr)	CO (g/kW-hr)	$PM/PM_{10}/PM_{2.5}$ (g/kW-hr)	SO_2 (ppm)	CO_2e (kg/MMBtu)
2,700 kW and 2,000 kW Emergency Diesel Generators	6.4	3.5	0.2	15	74.21
250 kW Emergency Engines	4.0	3.5	0.2	15	74.21

1.3.6.1 Emergency Diesel Generators $PM/PM_{10}/PM_{2.5}$ 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:

[32] 70 FR 39872 (July 11, 2005)

[33] 70 FR 39874 (July 11, 2005).

[34] Ibid.

- 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 100 hours per year of operation, makes post combustion controls such as a CDPF economically infeasible. Table 1-22 provides an economic evaluation for CDPF.

Table 1-22: Economic Evaluation for CDPF

Engine Size	CDPF Cost Effectiveness $/ton[35]
2,700 kW	119,414
2,000 kW	119,414
250 kW	161,404

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 1-21.

1.3.6.2 Emergency Diesel Generators 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 diesel generators includes:

- Purchase of certified NSPS IIII engine;
- Good combustion practices;
- Limitations on hours of operation; and
- SCR

[35] EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

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 diesel generators will have low emissions of NOx, compounded with the fact that they will be restricted to 100 hours per year of operation, makes post combustion controls such as an SCR economically infeasible. Table 1-23 provides an economic evaluation for SCR.

Table 1-23: Economic Evaluation for SCR

Engine Size	SCR Cost Effectiveness $/ton[36]
2,700 kW	24,637
2,000 kW	24,637
250 kW	24,670

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 1-21.

1.3.6.3 Emergency Diesel Generators CO and 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 CO and VOC controls for the emergency diesel generators includes:

- Purchase of certified NSPS IIII engine;
- Good combustion practices;
- Limitations on hours of operation;
- Oxidation catalysts; and
- CDPF

Step 2 – Eliminate Technically Infeasible Options

Oxidation catalysts require the exhaust characteristics to have less than 0.5% oxygen, which corresponds to fuel-rich operation. This method of operation is technically infeasible with lean-burn internal combustion engines. All of the other potential control technologies discussed in Step 1 are technically feasible.

36 EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

Step 3 – Rank Remaining Technically Feasible Control Options

A CDPF can achieve up to 90% control for CO.

Step 4 – Evaluate Remaining Control Technologies

Due to the fact that the emergency diesel generators will have low emissions of CO and VOC, compounded with the fact that they will be restricted to 100 hours per year of operation, makes post combustion controls such as CDPF economically infeasible.

Table 1-24: Economic Evaluation for CDPF

Engine Size	CDPF Cost Effectiveness $/ton[37]
2,700 kW	13,485
2,000 kW	13,485
250 kW	32,446

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 1-21.

1.3.6.4 Emergency Diesel Generators SO_2 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 SO_2 controls for the emergency diesel generators includes:

- Good combustion practices;
- Limitations on hours of operation; and
- ULSD

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

The use of ULSD represents the top BACT for emergency diesel generators.

Step 4 – Evaluate Remaining Control Technologies

All of the identified potential control technologies will be implemented for control of SO_2 emissions from the proposed emergency diesel generators.

Step 5 – Selection of BACT

Good combustion practices, the use of ULSD, 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

[37] EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

which are obtained through proper operation and maintenance of an EPA certified engine. A summary of these emission limits is shown in Table 1-21.

1.3.6.5 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.

APPENDIX E UPDATED RBLC TABLES

December 2020

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Black Start and Emergency Internal Cumbustion Engines	1500	kWe	Particulate matter, total (TPM)	Clean Fuel and Good Combustion Practices	0.25
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Black Start and Emergency Internal Cumbustion Engines	1500	kWe	Particulate matter, total; (TPM10)	Clean Fuel and Good Combustion Practices	0.25
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Black Start and Emergency Internal Cumbustion Engines	1500	kWe	Particulate matter, total; (TPM2.5)	Clean Fuel and Good Combustion Practices	0.25
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Fire Pump Diesel Internal Combustion Engines	252	hp	Particulate matter, total (TPM)	Clean Fuel and Good Combustion Practices	0.19
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Fire Pump Diesel Internal Combustion Engines	252	hp	Particulate matter, total; (TPM10)	Clean Fuel and Good Combustion Practices	0.19
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Fire Pump Diesel Internal Combustion Engines	252	hp	Particulate matter, total; (TPM2.5)	Clean Fuel and Good Combustion Practices	0.19
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Twelve (12) Large ULSD/Natural Gas-Fired Internal Combustion Engines	143.5	MMBtu/hr	Particulate matter, total (TPM)	Clean Fuel and Good Combustion Practices	0.29
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Twelve (12) Large ULSD/Natural Gas-Fired Internal Combustion Engines	143.5	MMBtu/hr	Particulate matter, filterable (FPM)	Clean Fuel and Good Combustion Practices	0.15
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Twelve (12) Large ULSD/Natural Gas-Fired Internal Combustion Engines	143.5	MMBtu/hr	Particulate matter, total; (TPM10)	Clean Fuel and Good Combustion Practices	0.29
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Twelve (12) Large ULSD/Natural Gas-Fired Internal Combustion Engines	143.5	MMBtu/hr	Particulate matter, filterable; (FPM10)	Clean Fuel and Good Combustion Practices	0.15
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Twelve (12) Large ULSD/Natural Gas-Fired Internal Combustion Engines	143.5	MMBtu/hr	Particulate matter, total; (TPM2.5)	Clean Fuel and Good Combustion Practices	0.29
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Twelve (12) Large ULSD/Natural Gas-Fired Internal Combustion Engines	143.5	MMBtu/hr	Particulate matter, filterable; (FPM2.5)	Clean Fuel and Good Combustion Practices	0.15
*AK-0085	GAS TREATMENT PLANT	8/13/2020	One (1) Black Start Generator Engine	186.6	gph	Particulate matter, total (TPM)	Good combustion practices, ULSD, and limit operation to 500 hours per year.	0.045
*AK-0085	GAS TREATMENT PLANT	8/13/2020	One (1) Black Start Generator Engine	186.6	gph	Particulate matter, total < 10 µ (TPM10)	Good combustion practices, ULSD, and limit operation to 500 hours per year.	0.045
*AK-0085	GAS TREATMENT PLANT	8/13/2020	One (1) Black Start Generator Engine	186.6	gph	Particulate matter, total < 2.5 µ (TPM2.5)	Good combustion practices, ULSD, and limit operation to 500 hours per year.	0.045
*AK-0085	GAS TREATMENT PLANT	8/13/2020	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	19.4	gph	Particulate matter, total (TPM)	Good combustion practices, ULSD, and limit operation to 500 hours per year per engine	0.19
*AK-0085	GAS TREATMENT PLANT	8/13/2020	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	19.4	gph	Particulate matter, total < 10 µ (TPM10)	Good combustion practices, ULSD, and limit operation to 500 hours per year per engine	0.19
*AK-0085	GAS TREATMENT PLANT	8/13/2020	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	19.4	gph	Particulate matter, total < 2.5 µ (TPM2.5)	Good combustion practices, ULSD, and limit operation to 500 hours per year per engine	0.19
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATOR SN-62	625	HP	Particulate matter, total; (TPM10)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.02
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATOR SN-62	625	HP	Particulate matter, total; (TPM2.5)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.02
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATOR SN-62	625	HP	Particulate matter, filterable (FPM)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.02
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATORS	1500	KW	Particulate matter, filterable (FPM)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.02
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATORS	1500	KW	Particulate matter, total; (TPM10)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.04
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATORS	1500	KW	Particulate matter, total; (TPM2.5)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.04
*AR-0161	SUN BIO MATERIAL COMPANY	9/23/2019	Emergency Engines	0		Particulate matter, filterable (FPM)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.02
*AR-0161	SUN BIO MATERIAL COMPANY	9/23/2019	Emergency Engines	0		Particulate matter, total; (TPM10)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.02
*AR-0161	SUN BIO MATERIAL COMPANY	9/23/2019	Emergency Engines	0		Particulate matter, total; (TPM2.5)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.02
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Particulate matter, total (TPM)	OPERATIONAL RESTRICTION OF 50 HR/YR; USE OF ULTRA LOW SULFUR FUEL NOT TO EXCEED 15 PPMVD FUEL SULFUR	0.2
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Particulate matter, total; (TPM2.5)	OPERATIONAL RESTRICTION OF 50 HR/YR; USE OF ULTRA LOW SULFUR FUEL NOT TO EXCEED 15 PPMVD	0.2
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Particulate matter, total (TPM)	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	0.2
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Particulate matter, total; (TPM2.5)	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Particulate matter, total (TPM)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Particulate matter, total; (TPM10)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Particulate matter, total; (TPM2.5)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Particulate matter, total (TPM)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Particulate matter, total; (TPM10)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Particulate matter, total; (TPM2.5)	USE ULTRA LOW SULFUR FUEL	0.2
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Generators, Two 2682 HP EA	0		Particulate matter, total (TPM)		0.2
FL-0328	ENI - HOLY CROSS DRILLING PROJECT	10/27/2011	Main Propulsion Engines	0		Particulate matter, filterable (FPM)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers (DEWT) measurement system.	0.43
FL-0328	ENI - HOLY CROSS DRILLING PROJECT	10/27/2011	Main Propulsion Engines	0		Particulate matter, total; (TPM10)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers (DEWT) measurement system.	0.24
FL-0328	ENI - HOLY CROSS DRILLING PROJECT	10/27/2011	Main Propulsion Engines	0		Particulate matter, total; (TPM2.5)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers (DEWT) measurement system.	0.24
FL-0332	HIGHLANDS BIOREFINERY AND COGENERATION PLANT	9/23/2011	2000 KW Emergency Equipment	0		Particulate matter, total (TPM)	See Pollutant Notes.	0.2
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - Development Driller 1	0		Particulate matter, filterable (FPM)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system, positive crankcase ventilation, turbocharger with aftercooler, and high pressure fuel injection with aftercooler.	0.43
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - Development Driller 1	0		Particulate matter, filterable; (FPM10)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system, positive crankcase ventilation, turbocharger with aftercooler, and high pressure fuel injection with aftercooler.	0.43
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - Development Driller 1	0		Particulate matter, filterable; (FPM2.5)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system, positive crankcase ventilation, turbocharger with aftercooler, and high pressure fuel injection with aftercooler.	0.57

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - C.R. Luigs	5875	hp	Particulate matter, filterable (FPM)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers measurement system, positive crankcase ventilation, turbocharger and aftercooler, and high pressure fuel injection with aftercooler.	0.43
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - C.R. Luigs	5875	hp	Particulate matter, filterable; (FPM10)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers measurement system, positive crankcase ventilation, turbocharger and aftercooler, and high pressure fuel injection with aftercooler.	0.24
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - C.R. Luigs	5875	hp	Particulate matter, filterable; (FPM2.5)	Use of good combustion practices based on the current manufacturer€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers measurement system, positive crankcase ventilation, turbocharger and aftercooler, and high pressure fuel injection with aftercooler.	0.24
FL-0346	LAUDERDALE PLANT	4/22/2014	Four 3100 kW black start emergency generators	2.32	MMBtu/hr	Particulate matter, total (TPM)	Good combustion practice	0.2
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Particulate matter, total; (TPM10)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.24
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Particulate matter, total (TPM)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.43
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Particulate matter, total; (TPM2.5)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.24
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	Three 3300-kW ULSD emergency generators	0		Particulate matter, total (TPM)	Use of clean fuel	0.2
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	One 422-hp emergency fire pump engine	0		Particulate matter, total (TPM)	Use of clean fuel	0.2
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Two 3300 kW emergency generators	0		Particulate matter, filterable (FPM)	Clean fuel	0.2
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Emergency Fire Pump Engine (422 hp)	0		Particulate matter, filterable (FPM)	Certified engine	0.2
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	1,500 kW Emergency Diesel Generator	14.82	MMBtu/hour	Particulate matter, filterable (FPM)	Operate and maintain the engine according to the manufacturer's written instructions	0.2
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	Emergency Fire Pump Engine (347 HP)	8700	gal/year	Particulate matter, filterable (FPM)	Operate and maintain the engine according to the manufacturer's written instructions	0.2
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Emergency Generator	142	GAL/H	Particulate matter, total (TPM)	good combustion practices	0.2
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Emergency Generator	142	GAL/H	Particulate matter, total; (TPM10)	good combustion practices	0.2
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Emergency Generator	142	GAL/H	Particulate matter, total; (TPM2.5)	good combustion practices	0.2
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Fire Pump	14	GAL/H	Particulate matter, total; (TPM2.5)	good combustion practices	0.2
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Fire Pump	14	GAL/H	Particulate matter, total; (TPM10)	good combustion practices	0.2
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Fire Pump	14	GAL/H	Particulate matter, total (TPM)	good combustion practices	0.2
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPI	7/12/2013	Emergency Generators	180	GAL/H	Particulate matter, total (TPM)	good combustion practices	0.2
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPI	7/12/2013	Emergency Generators	180	GAL/H	Particulate matter, total; (TPM10)	good combustion practices	0.2
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPI	7/12/2013	Emergency Generators	180	GAL/H	Particulate matter, total; (TPM2.5)	good combustion practices	0.2
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	EMERGENCY GENERATOR ENGINE	750	KW	Particulate Matter (PM)	TIER 2 ENGINE-BASED,GOOD COMBUSTION PRACTICES (GCP)	0.2
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	FIRE PUMP ENGINE	235	KW	Particulate Matter (PM)	TIER 3 ENGINE-BASED,GOOD COMBUSTION PRACTICES (GCP)	0.2
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3755	HP	Particulate matter, filterable (FPM)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.1
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3755	HP	Particulate matter, total; (TPM10)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.1
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3755	HP	Particulate matter, total; (TPM2.5)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.1
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Firewater Pump Engine	373	hp	Particulate matter, filterable (FPM)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.1
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Firewater Pump Engine	373	hp	Particulate matter, total; (TPM10)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.1
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Firewater Pump Engine	373	hp	Particulate matter, total; (TPM2.5)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.1
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Firewater Pump Engine	420	horsepower	Particulate matter, total (TPM)		0.2
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Emergency Engine	1500	kW	Particulate matter, total (TPM)		0.2
KS-0040	JOHNS MANVILLE AT MCPHERSON	12/3/2019	Emergency Diesel Engines	0		Particulate matter, filterable (FPM)	Emergency Diesel Engine and Fire Pump Subject to NSPS Subpart IIII - Combustion Control and Limited Operati	0.2
KS-0040	JOHNS MANVILLE AT MCPHERSON	12/3/2019	Emergency Diesel Engines	0		Particulate matter, filterable < 10 µ (FPM10)	One diesel engine and fire pump subject to NSPS Subpart IIII - Combustion Control and Limited Operating Hours	0.2
KS-0040	JOHNS MANVILLE AT MCPHERSON	12/3/2019	Emergency Diesel Engines	0		Particulate matter, filterable < 2.5 µ (FPM2.5)	One diesel fuel emergency engine and one fire pump subject to NSPS Subpart IIII - Combustion Control and Limi	0.2
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2922	HP	Particulate matter, total < 10µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2922	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2922	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2922	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2922	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2922	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-04 - Emergency Fire Water Pump	920	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-04 - Emergency Fire Water Pump	920	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-04 - Emergency Fire Water Pump	920	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2922	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2922	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2922	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	Particulate matter, total < 10 µ (TPM10)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.3
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	Particulate matter, total < 2.5 µ (TPM2.5)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.3
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	Particulate matter, filterable (FPM)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.3
LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2922	hp (each)	Particulate matter, total; (TPM10)	Complying with 40 CFR 60 Subpart IIII	0.2
LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2922	hp (each)	Particulate matter, total; (TPM2.5)	Complying with 40 CFR 60 Subpart IIII	0.2
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Large Emergency Engines (>50kW)	5364	HP	Particulate matter, total; (TPM10)	Good combustion and operating practices.	0.2
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Large Emergency Engines (>50kW)	5364	HP	Particulate matter, total; (TPM2.5)	Good combustion and operating practices.	0.2
MI-0423	INDECK NILES, LLC	1/4/2017	EUEMENGINE (Diesel fuel emergency engine)	22.68	MMBTU/H	Particulate matter, filterable (FPM)	Good combustion practices and meeting NSPS Subpart IIII requirements.	0.2
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUEMENGINE (North Plant): Emergency Engine	1341	HP	Particulate matter, filterable (FPM)	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.	0.2
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUEMENGINE (South Plant): Emergency Engine	1341	HP	Particulate matter, filterable (FPM)	Diesel particulate filter, good combustion practices and meeting NSPS IIII requirements.	0.2
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	7/16/2018	EUEMENGINE: Emergency engine	2	MW	Particulate matter, filterable (FPM)	State of the art combustion design	0.2
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	7/16/2018	EUFPENGINE: Fire pump engine	399	BHP	Particulate matter, filterable (FPM)	State of the art combustion design	0.2
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Particulate matter, total; (TPM10)	Ultra Low Sulfur Diesel/Fuel (15 ppm max)	0.4
*WI-0284	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		Particulate matter, total (TPM)	The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	0.17
*WI-0284	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		Particulate matter, total; (TPM10)	The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	0.17
*WI-0284	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		Particulate matter, total; (TPM2.5)	The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	0.17
*WI-0286	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Particulate matter, total (TPM)	Good Combustion Practices and The Use of Ultra-low Sulfur Fuel	17
*WI-0286	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Particulate matter, total; (TPM10)	Good Combustion Practices and The Use of Ultra-low Sulfur Fuel	0.17
*WI-0286	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Particulate matter, total; (TPM2.5)	Good Combustion Practices and The Use of Ultra-low Sulfur Fuel	0.17
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Particulate matter, total (TPM)	OPERATIONAL RESTRICTION OF 50 HR/YR; USE OF ULTRA LOW SULFUR FUEL NOT TO EXCEED 15 PPMVD FUEL SULFUR	0.2
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Particulate matter, total; (TPM2.5)	OPERATIONAL RESTRICTION OF 50 HR/YR; USE OF ULTRA LOW SULFUR FUEL NOT TO EXCEED 15 PPMVD	0.2
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Particulate matter, total (TPM)	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	0.2
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Particulate matter, total; (TPM2.5)	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Particulate matter, total (TPM)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Particulate matter, total; (TPM10)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Particulate matter, total; (TPM2.5)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Particulate matter, total (TPM)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Particulate matter, total; (TPM10)	USE ULTRA LOW SULFUR FUEL	0.2
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Particulate matter, total; (TPM2.5)	USE ULTRA LOW SULFUR FUEL	0.2
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Generators, Two 2682 HP EA	0		Particulate matter, total (TPM)		0.2
FL-0324	PALM BEACH RENEWABLE ENERGY PARK	12/23/2010	250 Kw Emergency Generator	0		Particulate matter, total (TPM)	Use of inherently clean ultra low sulfur distillate (ULSD) fuel oil and GCP & demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII	0.2
FL-0346	LAUDERDALE PLANT	4/22/2014	Four 3100 kW black start emergency generators	2.32	u/hr (HHV) per	Particulate matter, total (TPM)	Good combustion practice	0.2
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Particulate matter, total; (TPM10)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.24
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Particulate matter, total (TPM)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.43
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Particulate matter, total; (TPM2.5)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.24
FL-0354	LAUDERDALE PLANT	8/25/2015	Emergency fire pump engine, 300 HP	29	MMBTU/H	Particulate matter, total (TPM)	Low-emitting fuel and certified engine	0.2
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	Three 3300-kW ULSD emergency generators	0		Particulate matter, total (TPM)	Use of clean fuel	0.2
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	One 422-hp emergency fire pump engine	0		Particulate matter, total (TPM)	Use of clean fuel	0.2
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Two 3300 kW emergency generators	0		Particulate matter, filterable (FPM)	Clean fuel	0.2
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Emergency Fire Pump Engine (422 hp)	0		Particulate matter, filterable (FPM)	Certified engine	0.2
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	1,500 kW Emergency Diesel Generator	14.82	MMBtu/hour	Particulate matter, filterable (FPM)	Operate and maintain the engine according to the manufacturer's written instructions	0.2
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	Emergency Fire Pump Engine (347 HP)	8700	gal/year	Particulate matter, filterable (FPM)	Operate and maintain the engine according to the manufacturer's written instructions	0.2
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	150	hp	Particulate matter, filterable (FPM)		1.34
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	150	hp	Particulate matter, filterable; (FPM10)		1.34
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	250	hp	Particulate matter, filterable (FPM)		0.54
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	250	hp	Particulate matter, filterable; (FPM10)		1.34
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY GENERATOR	1490	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	0.2
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	305	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	0.2
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED AUXILIARY (EMERGENCY) ENGINES (TWO)	1500	KW	Particulate matter, filterable (FPM)	USE OF Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.2
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED FIRE PUMP ENGINE	300	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF Ultra Low Sulfur Diesel FUEL AND GOOD COMBUSTION PRACTICES	0.2
MI-0423	INDECK NILES, LLC	1/4/2017	EUEMENGINE (Diesel fuel emergency engine)	22.68	MMBTU/H	Particulate matter, filterable (FPM)	Good combustion practices and meeting NSPS Subpart IIII requirements.	0.2

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Emergency Camp Generators	2695	hp	Particulate matter, filterable (FPM10)		0.15
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Emergency Camp Generators	2695	hp	Particulate matter, filterable (FPM2.5)		0.15
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Airstrip Generator Engine	490	hp	Particulate matter, filterable (FPM10)		0.15
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Airstrip Generator Engine	490	hp	Particulate matter, filterable (FPM2.5)		0.15
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Agitator Generator Engine	98	hp	Particulate matter, filterable (FPM10)		0.3
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Agitator Generator Engine	98	hp	Particulate matter, filterable (FPM2.5)		0.3
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Incinerator Generator Engine	102	hp	Particulate matter, filterable (FPM10)		0.22
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Incinerator Generator Engine	102	hp	Particulate matter, filterable (FPM2.5)		0.22
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Fine Water Pumps	610	hp	Particulate matter, filterable (FPM10)		0.15
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Fine Water Pumps	610	hp	Particulate matter, filterable (FPM2.5)		0.15
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Bulk Tank Generator Engines	891	hp	Particulate matter, filterable (FPM10)		0.15
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Bulk Tank Generator Engines	891	hp	Particulate matter, filterable (FPM2.5)		0.15
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Diesel Fire Pump, One 600 HP	0		Particulate matter, total (TPM)		0.15
FL-0332	HIGHLANDS BIOREFINERY AND COGENERATION PLANT	9/23/2011	600 HP Emergency Equipment	0		Particulate matter, total (TPM)	See Pollutant Notes.	0.15
FL-0346	LAUDERDALE PLANT	4/22/2014	Emergency fire pump engine (300 HP)	29	MMBTU/H	Particulate matter, total (TPM)	Good combustion practice	0.2
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) FIREWATER PUMP Diesel ENGINES	371	BHP, EACH	Particulate matter, filterable (FPM)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) FIREWATER PUMP Diesel ENGINES	371	BHP, EACH	Particulate matter, filterable (FPM10)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) FIREWATER PUMP Diesel ENGINES	371	BHP, EACH	Particulate matter, filterable (FPM2.5)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) EMERGENCY Diesel GENERATORS	1006	HP EACH	Particulate matter, filterable (FPM)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) EMERGENCY Diesel GENERATORS	1006	HP EACH	Particulate matter, filterable (FPM10)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) EMERGENCY Diesel GENERATORS	1006	HP EACH	Particulate matter, filterable (FPM2.5)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	EMERGENCY Diesel GENERATOR	2012	HP	Particulate matter, filterable (FPM)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	EMERGENCY Diesel GENERATOR	2012	HP	Particulate matter, filterable (FPM10)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	EMERGENCY Diesel GENERATOR	2012	HP	Particulate matter, filterable (FPM2.5)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0263	MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3600	HP EACH	Particulate matter, total (TPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0263	MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3600	HP EACH	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0263	MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3600	HP EACH	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
*KY-0109	FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	53.6	gal/hr	Particulate matter, total (TPM2.5)	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 Division€™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.	0.149
*KY-0109	FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	53.6	gal/hr	Particulate matter, filterable (FPM)	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 Division€™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.	0.149
*KY-0109	FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	53.6	gal/hr	Particulate matter, total (TPM10)	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 Division€™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.	0.149
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Particulate matter, total (TPM2.5)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Particulate matter, total (TPM10)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Particulate matter, total (TPM10)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Particulate matter, total (TPM2.5)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	Firewater Pump Engines	288	hp (each)	Particulate matter, total (TPM10)	Complying with 40 CFR 60 Subpart IIII	0.15
LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	Firewater Pump Engines	288	hp (each)	Particulate matter, total (TPM2.5)	Complying with 40 CFR 60 Subpart IIII	0.15
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Firewater Pumps	634	kW	Particulate matter, total (TPM10)	Good combustion and operating practices.	0.3
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Firewater Pumps	634	kW	Particulate matter, total (TPM2.5)	Good combustion and operating practices.	0.3
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Emergency Engine/Generator	7.4	MMBTU/H	Particulate matter, total (TPM10)		0.15
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Emergency Engine/Generator	7.4	MMBTU/H	Particulate matter, total (TPM2.5)		0.15
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Fire Pump Engine	2.7	MMBTU/H	Particulate matter, total (TPM10)		0.15
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Fire Pump Engine	2.7	MMBTU/H	Particulate matter, total (TPM2.5)		0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY GENERATOR	1300	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	0.17
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	350	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	0.17
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17
MI-0400	WOLVERINE POWER	6/29/2011	Emergency generator	4000	HP	Particulate matter, filterable (FPM)		0.15
MI-0400	WOLVERINE POWER	6/29/2011	Fire Pump	420	HP	Particulate matter, filterable (FPM)		0.15
MI-0406	RENAISSANCE POWER LLC	11/1/2013	FG-EMGEN7-8; Two (2) 1,000kW Diesel-fueled emergency reciprocating internal combustion engines	1000	kW	Particulate matter, filterable (FPM)	Good combustion practices.	0.15
MI-0406	RENAISSANCE POWER LLC	11/1/2013	FG-EMGEN7-8; Two (2) 1,000kW Diesel-fueled emergency reciprocating internal combustion engines	1000	kW	Particulate matter, total (TPM10)	Good combustion practices.	0.15
MI-0406	RENAISSANCE POWER LLC	11/1/2013	FG-EMGEN7-8; Two (2) 1,000kW Diesel-fueled emergency reciprocating internal combustion engines	1000	kW	Particulate matter, total (TPM2.5)	Good combustion practices	0.15
MI-0423	INDECK NILES, LLC	1/4/2017	EUFPENGINE (Emergency engine--Diesel fire pump)	1.66	MMBTU/H	Particulate matter, filterable (FPM)	Good combustion practices and meeting NSPS Subpart IIII requirements.	0.15
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUFPENGINE (South Plant): Fire pump engine	300	HP	Particulate matter, filterable (FPM)	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.	0.15
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUFPENGINE (North Plant): Fire pump engine	300	HP	Particulate matter, filterable (FPM)	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.	0.15
NY-0104	CPV VALLEY ENERGY CENTER	8/1/2013	Emergency generator	0		Particulate matter, filterable (FPM)	Ultra Low Sulfur Diesel with maximum sulfur content 0.0015 percent.	0.03
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Emergency Generator	0		Particulate matter, total (TPM10)		0.02
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Emergency Generator	0		Particulate matter, total (TPM2.5)		0.02
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Fire Pump	0		Particulate matter, total (TPM10)		0.09
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Fire Pump	0		Particulate matter, total (TPM2.5)		0.09
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	Fire pump engine	15	gal/hr	Particulate matter, filterable (FPM)		0.11
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	Fire pump engine	15	gal/hr	Particulate matter, total (TPM10)		0.11
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	Fire pump engine	15	gal/hr	Particulate matter, total (TPM2.5)		0.11
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0		Particulate matter, filterable (FPM)		0.025
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0		Particulate matter, total (TPM10)		0.025
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0		Particulate matter, total (TPM2.5)		0.025
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0		Particulate matter, total (TPM)		0.15
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Fire Pump Engine	0		Particulate matter, total (TPM)		0.15
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0		Particulate matter, total (TPM)		0.04
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0		Particulate matter, total (TPM10)		0.04
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0		Particulate matter, total (TPM2.5)		0.04
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Fire Pump Engine	0		Particulate matter, total (TPM)		0.2
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Fire Pump Engine	0		Particulate matter, total (TPM10)		0.2
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Particulate matter, filterable (FPM)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Particulate matter, total (TPM10)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Particulate matter, total (TPM2.5)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Particulate matter, filterable (FPM)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Particulate matter, total (TPM10)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Particulate matter, total (TPM2.5)		0.15
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED WATER PUMP 376 bph (1)	0		Particulate matter, total (TPM10)	Ultra Low Sulfur Diesel/Fuel (15 ppm max)	0.3
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED WATER PUMP 376 bph (1)	0		Particulate matter, total (TPM2.5)	Ultra Low Sulfur Diesel/Fuel (15 ppm max)	0.3
VA-0325	GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Particulate matter, total (TPM10)		0.19
VA-0325	GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Particulate matter, filterable (FPM2.5)	Low sulfur fuel and good combustion practices	0.019
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Particulate matter, filterable (FPM)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Particulate matter, total (TPM10)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Particulate matter, total (TPM2.5)	Good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Particulate matter, filterable (FPM)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	15
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Particulate matter, total (TPM10)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Particulate matter, total (TPM2.5)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emergency Diesel Generator - 300 kW	500	H/YR	Particulate matter, filterable (FPM)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emergency Diesel Generator - 300 kW	500	H/YR	Particulate matter, total (TPM10)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emergency Diesel Generator - 300 kW	500	H/YR	Particulate matter, total (TPM2.5)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emegency Fire Water Pump	500	HR/YR	Particulate matter, total (TPM2.5)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emegency Fire Water Pump	500	HR/YR	Particulate matter, total (TPM10)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emegency Fire Water Pump	500	HR/YR	Particulate matter, filterable (FPM)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
WV-0027	INWOOD	9/15/2017	Emergency Generator - ESDG14	900	bhp	Particulate matter, total (TPM10)	ULSD	0.2
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	EMERGENCY IC ENGINE	550	KW	Particulate matter, total (TPM)	USE PUC QUALITY PIPELINE Natural Gas	0.34
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	EMERGENCY IC ENGINE	550	KW	Particulate matter, total (TPM10)	USE PUC QUALITY PIPELINE Natural Gas	0.34
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Diesel Fire Pump, One 600 HP	0		Particulate matter, total (TPM)		0.15
FL-0324	PALM BEACH RENEWABLE ENERGY PARK	12/23/2010	Two emergency Diesel firewater pump engines	250	HP	Particulate matter, total (TPM)	demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII	0.15
FL-0346	LAUDERDALE PLANT	4/22/2014	Emergency fire pump engine (300 HP)	29	MMBTU/H	Particulate matter, total (TPM)	Good combustion practice	0.2
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.15
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Particulate matter, total (TPM2.5)	GOOD COMBUSTION PRACTICES	0.15
IN-0234	GRAIN PROCESSING CORPORATION	12/8/2015	EMERGENCY FIRE PUMP ENGINE	0		Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	0.16
IN-0234	GRAIN PROCESSING CORPORATION	12/8/2015	EMERGENCY FIRE PUMP ENGINE	0		Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES	0.16
KS-0029	THE EMPIRE DISTRICT ELECTRIC COMPANY	7/14/2015	Emergency Diesel engine	750	KW	Particulate matter, total (TPM2.5)	Low sulfur fuel oil (<15 ppm sulfur)	0.15
KS-0029	THE EMPIRE DISTRICT ELECTRIC COMPANY	7/14/2015	Emergency Diesel engine	750	KW	Particulate matter, total (TPM10)	Low sulfur fuel oil (<15 ppm sulfur)	0.15
KS-0029	THE EMPIRE DISTRICT ELECTRIC COMPANY	7/14/2015	Emergency Diesel engine	750	KW	Particulate matter, total (TPM)	Low sulfur fuel oil (<15 ppm sulfur)	0.15
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Spark ignition RICE emergency AC generators	450	kW	Particulate matter, total (TPM)		0.0001
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Spark ignition RICE emergency AC generators	450	kW	Particulate matter, total (TPM10)		0.0001
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Spark ignition RICE emergency AC generators	450	kW	Particulate matter, total (TPM2.5)		0.0001
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Compression ignition RICE emergency fire pump	197	HP	Particulate matter, total (TPM)		0.15
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Compression ignition RICE emergency fire pump	197	HP	Particulate matter, total (TPM10)		0.15
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Compression ignition RICE emergency fire pump	197	HP	Particulate matter, total (TPM2.5)		0.15
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Particulate matter, total (TPM2.5)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Particulate matter, total (TPM10)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Particulate matter, total (TPM10)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Particulate matter, total (TPM2.5)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	0.15
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY GENERATOR	1500	KW	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	0.15
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY GENERATOR	1500	KW	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	0.15
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	300	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	0.15
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	300	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY GENERATOR	1300	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	0.17
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	350	HP	Particulate matter, total (TPM10)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	0.17
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.15
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMITS	0.17
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY GENERATOR	1490	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES.	0.18
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY GENERATOR	1490	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AN DGOOD COMBUSTION PRACTICES	0.18
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	305	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES.	0.18
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	305	HP	Particulate matter, total (TPM2.5)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	0.18
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED AUXILIARY (EMERGENCY) ENGINES (TWO)	1500	KW	Particulate matter, total (TPM10)	USE OF Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES.	0.18
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED FIRE PUMP ENGINE	300	HP	Particulate matter, total (TPM10)	EXCLUSIVE USE OF Ultra Low Sulfur Diesel FUEL AND GOOD COMBUSTION PRACTICES	0.18
MI-0410	THETFORD GENERATING STATION	7/25/2013	EU-FPENGINE: Diesel fuel fired emergency backup fire pump	315	hp nameplate	Particulate matter, filterable (FPM)	Proper combustion design and Ultra Low Sulfur Diesel fuel.	0.15
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/4/2013	Emergency Engine --Diesel Fire Pump (EUFPENGINE)	165	HP	Particulate matter, filterable (FPM)	Good combustion practices	0.22
MI-0423	INDECK NILES, LLC	1/4/2017	EUFPENGINE (Emergency engine--Diesel fire pump)	1.66	MMBTU/H	Particulate matter, filterable (FPM)	Good combustion practices and meeting NSPS Subpart IIII requirements.	0.15

Summary of RBLC Results for PM Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
MI-0424	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/5/2016	EUFPENGINE (Emergency engine--Diesel fire pump)	500	H/YR	Particulate matter, filterable (FPM)	Good combustion practices.	0.22
NJ-0081	PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/7/2014	Emergency Diesel fire pump	0		Particulate matter, filterable (FPM)	Use of Ultra low sulfur distillate oil	0.15
NJ-0081	PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/7/2014	Emergency Diesel fire pump	0		Particulate matter, total (TPM10)	Use of ultra low sulfur distillate oil	0.15
NJ-0081	PSEG FOSSIL LLC SEWAREN GENERATING STATION	3/7/2014	Emergency Diesel fire pump	0		Particulate matter, total (TPM2.5)	Use of Ultra low sulfur distillate oil	0.15
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Black start generator	3000	KW	Particulate matter, filterable (FPM)	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	0.15
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Emergency fire pump	460	hp	Particulate matter, filterable (FPM)	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	0.087
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0		Particulate matter, total (TPM)		0.15
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Fire Pump Engine	0		Particulate matter, total (TPM)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Particulate matter, filterable (FPM)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Particulate matter, total (TPM10)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Particulate matter, total (TPM2.5)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Particulate matter, filterable (FPM)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Particulate matter, total (TPM10)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Particulate matter, total (TPM2.5)		0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Particulate matter, filterable (FPM)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Particulate matter, total (TPM10)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Particulate matter, total (TPM2.5)	Good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Particulate matter, filterable (FPM)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	15
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Particulate matter, total (TPM10)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Particulate matter, total (TPM2.5)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.15

Summary of RBLC Results for NOx Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

NOx Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Black Start and Emergency Internal Cumbustion Engines	1500	kWe	Nitrogen Oxides (NOx)	Good Combustion Practices	8
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Fire Pump Diesel Internal Combustion Engines	252	hp	Nitrogen Oxides (NOx)	Good Combustion Practices	3.7
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Nitrogen Oxides (NOx)	OPERATIONAL RESTRICTION OF 50 HR/YR	6
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Nitrogen Oxides (NOx)	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	3.8
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Nitrogen Oxides (NOx)		6.4
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Nitrogen Oxides (NOx)		4
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Generators, Two 2682 HP EA	0		Nitrogen Oxides (NOx)		6.4
FL-0327	ANADARKO - PHEONIX PROSPECT	6/13/2011	Main Propulsion Engines	0		Nitrogen Oxides (NOx)	Use of good combustion and maintenance practices, Power Management System, and NOx Concentration Maintenance System as described in the OCS permit application.	12.7
FL-0328	ENI - HOLY CROSS DRILLING PROJECT	10/27/2011	Main Propulsion Engines	0		Nitrogen Oxides (NOx)	Use of good combustion practices based on the current manufacturerâ€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers (DEWT) measurement system.	12.7
FL-0332	HIGHLANDS BIOREFINERY AND COGENERATION PLANT	9/23/2011	2000 KW Emergency Equipment	0		Nitrogen Oxides (NOx)	See Pollutant Notes.	6.4
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - Development Driller 1	0		Nitrogen Oxides (NOx)	Use of good combustion practices based on the current manufacturerâ€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system, positive crankcase ventilation, turbocharger with aftercooler, and high pressure fuel injection with aftercooler.	12.1
FL-0338	SAKE PROSPECT DRILLING PROJECT	5/30/2012	Main Propulsion Engines - C.R. Luigs	5875	hp	Nitrogen Oxides (NOx)	Use of good combustion practices based on the current manufacturerâ€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system, positive crankcase ventilation, turbocharger with aftercooler, and high pressure fuel injection with aftercooler.	18.1
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Nitrogen Oxides (NOx)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	12.7
FL-0348	MURPHY EXPLORATION & PRODUCTION CO.	5/15/2012	Main Propulsion Generators	4425	hp	Nitrogen Oxides (NOx)	Use of engine with turbo charger with after cooler, an enhanced work practice power management, NOx emissions maintenance system, and good combustion and maintenance practices based on the current manufacturerâ€™s specifications for each engine	26
FL-0348	MURPHY EXPLORATION & PRODUCTION CO.	5/15/2012	Drill Floor and Crew Quarters Electrical Generators	6789	hp	Nitrogen Oxides (NOx)	Use of engine with turbo charger with after cooler, an enhanced work practice power management, NOx emissions maintenance system, and good combustion and maintenance practices based on the current manufacturerâ€™s specifications for each engine.	26
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	1,500 kW Emergency Diesel Generator	14.82	MMBtu/hour	Nitrogen Oxides (NOx)	Operate and maintain the engine according to the manufacturer's written instructions	6.4
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	Emergency Fire Pump Engine (347 HP)	8700	gal/year	Nitrogen Oxides (NOx)	Operate and maintain the engine according to the manufacturer's written instructions	4
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Emergency Generator	142	GAL/H	Nitrogen Oxides (NOx)	good combustion practices	6
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Fire Pump	14	GAL/H	Nitrogen Oxides (NOx)	good combustion practices	3.75
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	EMERGENCY GENERATOR ENGINE	750	KW	Nitrogen Oxides (NOx)	TIER 2 ENGINE-BASED,GOOD COMBUSTION PRACTICES (GCP)	6.4
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	FIRE PUMP ENGINE	235	KW	Nitrogen Oxides (NOx)	TIER 3 ENGINE-BASEDGOOD COMBUSTION PRACTICES (GCP)	4
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3755	HP	Nitrogen Oxides (NOx)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.67
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Firewater Pump Engine	373	hp	Nitrogen Oxides (NOx)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	3.5
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Firewater Pump Engine	420	horsepower	Nitrogen Oxides (NOx)		4
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Emergency Engine	1500	kW	Nitrogen Oxides (NOx)		6.4
LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	Emergency Generator Engines	2922	hp (each)	Nitrogen Oxides (NOx)	Complying with 40 CFR 60 Subpart IIII	6.4
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Large Emergency Engines (>50kW)	5364	HP	Nitrogen Oxides (NOx)	Good Combustion and Operating Practices	5.6
MI-0394	WARREN TECHNICAL CENTER	2/29/2012	Four (4) Emergency Generators	2280	KW	Nitrogen Oxides (NOx)	No add-on controls, but ignition timing retardation (ITR) is good design. Engines are tuned for low-NOx operation versus low CO operation.	6.93
MI-0394	WARREN TECHNICAL CENTER	2/29/2012	Nine (9) DRUPS Emergency Generators	3010	KW	Nitrogen Oxides (NOx)	No add-on controls, but ignition timing retardation (ITR) is good design. Engines are tuned for low-NOx operation versus low CO operation.	5.98
MI-0395	WARREN TECHNICAL CENTER	7/13/2012	Nine (9) DRUPS Emergency Generators	3010	KW	Nitrogen Oxides (NOx)	No add-on controls, but ignition timing retardation (ITR) is good design. Engines are tuned for low-NOx operation versus low CO operation.	5.98
MI-0395	WARREN TECHNICAL CENTER	7/13/2012	Four (4) Emergency Generators	2500	KW	Nitrogen Oxides (NOx)	No add-on control, but ignition timing retardation (ITR) is good design. Engines are tuned for low-NOx operation versus low CO operation.	7.13
MI-0418	WARREN TECHNICAL CENTER	1/14/2015	FG-BACKUPGENS (Nine (9) DRUPS Emergency Engines)	3490	KW	Nitrogen Oxides (NOx)	No add-on controls, but injection timing retardation (ITR) is good design. Engines are tuned for low-NOx operation versus low CO operation.	8
MI-0418	WARREN TECHNICAL CENTER	1/14/2015	Four (4) emergency engines in FG-BACKUPGENS	2710	KW	Nitrogen Oxides (NOx)	No add-on controls, but injection timing retardation (ITR) is good design. Engines are tuned for low-NOx operation versus low CO operation.	7.13
MI-0423	INDECK NILES, LLC	1/4/2017	EUEMENGINE (Diesel fuel emergency engine)	22.68	MMBTU/H	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS IIII requirements.	6.4
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUEMENGINE (North Plant): Emergency Engine	1341	HP	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS Subpart IIII requirements.	6.4
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUEMENGINE (South Plant): Emergency Engine	1341	HP	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS IIII requirements.	6.4
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	7/16/2018	EUEMENGINE: Emergency engine	2	MW	Nitrogen Oxides (NOx)	State of the art combustion design.	6.4
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	7/16/2018	EUFPENGINE: Fire pump engine	399	BHP	Nitrogen Oxides (NOx)	State of the art combustion design.	4
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD1--A 1500 HP Diesel fueled emergency engine	1500	HP	Nitrogen Oxides (NOx)	Good combustion practices and will be NSPS compliant.	6.4
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD2--A 6000 HP Diesel fuel fired emergency engine	6000	HP	Nitrogen Oxides (NOx)	Good combustion practices and will be NSPS compliant.	6.4
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY ENGINE 1 THRU 8	29	HP	Nitrogen Oxides (NOx)	PURCHASE OF CERTIFIED ENGINE.	7.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	FIRE PUMP	500	HP	Nitrogen Oxides (NOx)	PURCHASE OF CERTIFIED ENGINE BASED ON NSPS, SUBPART IIII.	4
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY GENERATORS 1 THRU 8	757	HP	Nitrogen Oxides (NOx)	ENGINES MUST BE CERTIFIED TO COMPLY WITH NSPS, SUBPART IIII.	4
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Nitrogen Oxides (NOx)	Good Combustion Practices/Maintenance	6.4
*WI-0284	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		Nitrogen Oxides (NOx)	The Use of Ultra-Low Sulfur Fuel and Good Combustion Practices	5.36
*WI-0286	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Nitrogen Oxides (NOx)	Good Combustion Practices, The Use of an Engine Turbocharger and Aftercooler.	5.36
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Nitrogen Oxides (NOx)	OPERATIONAL RESTRICTION OF 50 HR/YR	6
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Nitrogen Oxides (NOx)	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	3.8
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Nitrogen Oxides (NOx)		6.4
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Nitrogen Oxides (NOx)		4

Summary of RBLC Results for NOx Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

NOx Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Generators, Two 2682 HP EA	0		Nitrogen Oxides (NOx)		6.4
FL-0324	PALM BEACH RENEWABLE ENERGY PARK	12/23/2010	250 Kw Emergency Generator	0		Nitrogen Oxides (NOx)	Use of inherently clean ultra low sulfur distillate (ULSD) fuel oil and GCP	4
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Nitrogen Oxides (NOx)	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	12.7
FL-0354	LAUDERDALE PLANT	8/25/2015	Emergency fire pump engine, 300 HP	29	MMBTU/H	Nitrogen Oxides (NOx)	Low-emitting fuel and certified engine	4
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	1,500 kW Emergency Diesel Generator	14.82	MMBtu/hour	Nitrogen Oxides (NOx)	Operate and maintain the engine according to the manufacturer's written instructions	6.4
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	Emergency Fire Pump Engine (347 HP)	8700	gal/year	Nitrogen Oxides (NOx)	Operate and maintain the engine according to the manufacturer's written instructions	4
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVI	2/23/2018	Emergency Diesel Generators	250	hp	Nitrogen Oxides (NOx)		9.2
LA-0328	PLAQUEMINES PLANT 1	5/2/2018	Emergency Diesel Engine Pump P-39A	375	HP	Nitrogen Oxides (NOx)	Good combustion practices and NSPS IIII	4
LA-0328	PLAQUEMINES PLANT 1	5/2/2018	Emergency Diesel Engine Pump P-39B	300	HP	Nitrogen Oxides (NOx)	Good combustion practices and NSPS Subpart IIII	4
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY GENERATOR	1490	HP	Nitrogen Oxides (NOx)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	6.4
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	305	HP	Nitrogen Oxides (NOx)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	4
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED AUXILIARY (EMERGENCY) ENGINES (TWO)	1500	KW	Nitrogen Oxides (NOx)	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	6.4
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED FIRE PUMP ENGINE	300	HP	Nitrogen Oxides (NOx)	EXCLUSIVE USE OF Ultra Low Sulfur Diesel FUEL AND GOOD COMBUSTION PRACTICES	4
MI-0423	INDECK NILES, LLC	1/4/2017	EUEMENGINE (Diesel fuel emergency engine)	22.68	MMBTU/H	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS IIII requirements.	6.4
MI-0434	FLAT ROCK ASSEMBLY PLANT	3/22/2018	EUENGINE01 through EUENGINE08	3633	BHP	Nitrogen Oxides (NOx)	Good combustion practices.	6.4
MI-0434	FLAT ROCK ASSEMBLY PLANT	3/22/2018	EULIFESAFETYENG - One Diesel-fueled emergency engine/generator	500	KW	Nitrogen Oxides (NOx)	Good combustion practices.	4
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD1--A 1500 HP Diesel fueled emergency engine	1500	HP	Nitrogen Oxides (NOx)	Good combustion practices and will be NSPS compliant.	6.4
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD2--A 6000 HP Diesel fuel fired emergency engine	6000	HP	Nitrogen Oxides (NOx)	Good combustion practices and will be NSPS compliant.	6.4
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY ENGINE 1 THRU 8	29	HP	Nitrogen Oxides (NOx)	PURCHASE OF CERTIFIED ENGINE.	7.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	FIRE PUMP	500	HP	Nitrogen Oxides (NOx)	PURCHASE OF CERTIFIED ENGINE BASED ON NSPS, SUBPART IIII.	4
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY GENERATORS 1 THRU 8	757	HP	Nitrogen Oxides (NOx)	ENGINES MUST BE CERTIFIED TO COMPLY WITH NSPS, SUBPART IIII.	4
*WI-0291	GRAYMONT WESTERN LIME-EDEN	1/28/2019	P04 Emergency Diesel Generator	0.22	mmBTU/hr	Nitrogen Oxides (NOx)	Good Combustion Practices	4.7

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Emergency Camp Generators	2695	hp	Nitrogen Oxides (NOx)		4.8
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Airstrip Generator Engine	490	hp	Nitrogen Oxides (NOx)		4.8
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Agitator Generator Engine	98	hp	Nitrogen Oxides (NOx)		5.6
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Fine Water Pumps	610	hp	Nitrogen Oxides (NOx)		3
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Bulk Tank Generator Engines	891	hp	Nitrogen Oxides (NOx)		4.8
*AK-0085	GAS TREATMENT PLANT	8/13/2020	One (1) Black Start Generator Engine	186.6	gph	Nitrogen Oxides (NOx)	Good combustion practices, limit operation to 500 hours per year.	3.3
*AK-0085	GAS TREATMENT PLANT	8/13/2020	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generat	19.4	gph	Nitrogen Oxides (NOx)	Good combustion practices, limit operation to 500 hours per year per engine	3.6
CA-1220	SAN DIEGO INTERNATIONAL AIRPORT	10/3/2011	ICE:Emergency-Compression Ignition	1881	BHP	Nitrogen Oxides (NOx)	Tier 2 certified and 50 hr/y M&T limit	3.9
CA-1221	PACIFIC BELL	12/5/2011	ICE:Emergency-Compression Ignition	3634	bhp	Nitrogen Oxides (NOx)	Tier 2 certified and 50 hr/yr for M&T limit	3.5
FL-0332	HIGHLANDS BIOREFINERY AND COGENERATION PLANT	9/23/2011	600 HP Emergency Equipment	0		Nitrogen Oxides (NOx)	See Pollutant Notes.	3
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) FIREWATER PUMP Diesel ENGINES	371	BHP, EACH	Nitrogen Oxides (NOx)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	3
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) EMERGENCY Diesel GENERATORS	1006	HP EACH	Nitrogen Oxides (NOx)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	4.8
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	EMERGENCY Diesel GENERATOR	2012	HP	Nitrogen Oxides (NOx)	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	4.8
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	4.46
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	2.83
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	2.83
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	4.46
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	2.86
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	4.46
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	2.83
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	2.83
IN-0263	MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3600	HP EACH	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	4.42
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2922	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2922	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-04 - Emergency Fire Water Pump	920	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2922	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	3.5
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	Nitrogen Oxides (NOx)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2
LA-0309	BENTELER STEEL TUBE FACILITY	6/4/2015	Firewater Pump Engines	288	hp (each)	Nitrogen Oxides (NOx)	Complying with 40 CFR 60 Subpart IIII	3
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Firewater Pumps	634	kW	Nitrogen Oxides (NOx)	Good Combustion and Operating Practices.	3.1
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Emergency Engine/Generator	7.4	MMBTU/H	Nitrogen Oxides (NOx)		4.8
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Fire Pump Engine	2.7	MMBTU/H	Nitrogen Oxides (NOx)		3
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Nitrogen Oxides (NOx)	LIMITED OPERATING HOURS, USE OF ULTRA- LOW SULFUR FUEL AND GOOD COMBUSTION PRACTIC	4.8
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Nitrogen Oxides (NOx)	LIMITED OPERATING HOURS, USE OF ULTRA- LOW SULFUR FUEL AND GOOD COMBUSTION PRACTIC	3

Summary of RBLC Results for NOx Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

NOx Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY GENERATOR	1300	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	4.8
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	350	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	3
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMIT	4.8
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMIT	3
MI-0400	WOLVERINE POWER	6/29/2011	Fire Pump	420	HP	Nitrogen Oxides (NOx)		3
MI-0406	RENAISSANCE POWER LLC	11/1/2013	FG-EMGEN7-8; Two (2) 1,000kW Diesel-fueled emergency reciprocating	1000	kW	Nitrogen Oxides (NOx)	Good combustion practices	4.8
MI-0423	INDECK NILES, LLC	1/4/2017	EUFPENGINE (Emergency engine--Diesel fire pump)	1.66	MMBTU/H	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS Subpart IIII requirements.	3
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUFPENGINE (South Plant): Fire pump engine	300	HP	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS Subpart IIII requirements.	3
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUFPENGINE (North Plant): Fire pump engine	300	HP	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS Subpart IIII requirements.	3
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Emergency Generator	0		Nitrogen Oxides (NOx)		4.93
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Fire Pump	0		Nitrogen Oxides (NOx)		2.6
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	Fire pump engine	15	gal/hr	Nitrogen Oxides (NOx)		3
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0		Nitrogen Oxides (NOx)		5.45
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0		Nitrogen Oxides (NOx)		4.8
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Fire Pump Engine	0		Nitrogen Oxides (NOx)		3
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0		Nitrogen Oxides (NOx)		4.93
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Fire Pump Engine	0		Nitrogen Oxides (NOx)		3
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Nitrogen Oxides (NOx)		2.85
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Nitrogen Oxides (NOx)		2.85
TX-0728	PEONY CHEMICAL MANUFACTURING FACILITY	4/1/2015	Emergency Diesel Generator	1500	hp	Nitrogen Oxides (NOx)	Minimized hours of operations Tier II engine	0.0218
VA-0325	GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Nitrogen Oxides (NOx)	Good Combustion Practices/Maintenance	2
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Nitrogen Oxides (NOx)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	4.8
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Nitrogen Oxides (NOx)	Good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	3
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emergency Diesel Generator - 300 kW	500	H/YR	Nitrogen Oxides (NOx)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	4.8
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emegency Fire Water Pump	500	HR/YR	Nitrogen Oxides (NOx)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	3
WV-0027	INWOOD	9/15/2017	Emergency Generator - ESDG14	900	bhp	Nitrogen Oxides (NOx)	Engine Design	4.77
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	EMERGENCY FIREWATER PUMP ENGINE	288	HP	Nitrogen Oxides (NOx)	EQUIPPED W/ A TURBOCHARGER AND AN INTERCOOLER/AFTERCOOLER	3.4
FL-0324	PALM BEACH RENEWABLE ENERGY PARK	12/23/2010	Two emergency Diesel firewater pump engines	250	HP	Nitrogen Oxides (NOx)	demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII	3
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	4.46
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	2.86
IN-0234	GRAIN PROCESSING CORPORATION	12/8/2015	EMERGENCY FIRE PUMP ENGINE	0		Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	9.5
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	150	hp	Nitrogen Oxides (NOx)		14.06
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Compression ignition RICE emergency fire pump	197	HP	Nitrogen Oxides (NOx)		3
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY GENERATOR	1500	KW	Nitrogen Oxides (NOx)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, AND LIMITING THE HOURS OF OPERATION	4.8
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	300	HP	Nitrogen Oxides (NOx)	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, AND LIMITING THE HOURS OF OPERATION	3
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Nitrogen Oxides (NOx)	LIMITED OPERATING HOURS, USE OF ULTRA- LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	4.8
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Nitrogen Oxides (NOx)	LIMITED OPERATING HOURS, USE OF ULTRA- LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	3
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY GENERATOR	1300	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	4.8
MD-0043	PERRYMAN GENERATING STATION	7/1/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	350	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, LIMITED HOURS OF OPERATION, AND EXCLUSIVE USE OF ULSD	3
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMIT	4.8
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES AND DESIGNED TO ACHIEVE EMISSION LIMIT	3
MI-0410	THETFORD GENERATING STATION	7/25/2013	EU-FPENGINE: Diesel fuel fired emergency backup fire pump	315	hp nameplate	Nitrogen Oxides (NOx)	Proper combustion design and Ultra Low Sulfur Diesel fuel.	3
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/4/2013	Emergency Engine --Diesel Fire Pump (EUFPENGINE)	165	HP	Nitrogen Oxides (NOx)	Good combustion practices	3
MI-0423	INDECK NILES, LLC	1/4/2017	EUFPENGINE (Emergency engine--Diesel fire pump)	1.66	MMBTU/H	Nitrogen Oxides (NOx)	Good combustion practices and meeting NSPS Subpart IIII requirements.	3
MI-0424	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/5/2016	EUFPENGINE (Emergency engine--Diesel fire pump)	500	H/YR	Nitrogen Oxides (NOx)	Good combustion practices.	3
MI-0434	FLAT ROCK ASSEMBLY PLANT	3/22/2018	EUFIREPUMPENGS (2 emergency fire pump engines)	250	BHP	Nitrogen Oxides (NOx)	Good combustion practices.	3
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Black start generator	3000	KW	Nitrogen Oxides (NOx)	Generator equipped with selective catalytic reduction. Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	2.11
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Emergency fire pump	460	hp	Nitrogen Oxides (NOx)	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	2.6
*PA-0282	JOHNSON MATTHEY INC/CATALYTIC SYSTEMS DIV	6/1/2012	650-KW BACKUP Diesel GENERATOR	45.8	GAL/H	Nitrogen Oxides (NOx)		6.9
*PA-0282	JOHNSON MATTHEY INC/CATALYTIC SYSTEMS DIV	6/1/2012	400-KW Diesel EMERGENCY GENERATOR	29.2	GAL/H	Nitrogen Oxides (NOx)		6.9
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0		Nitrogen Oxides (NOx)		4.8
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Fire Pump Engine	0		Nitrogen Oxides (NOx)		3

Summary of RBLC Results for NOx Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

NOx Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Nitrogen Oxides (NOx)		2.85
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Nitrogen Oxides (NOx)		2.85
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Nitrogen Oxides (NOx)	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	4.8
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Nitrogen Oxides (NOx)	Good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	3

Summary of RBLC Results for CO Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

CO Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Black Start and Emergency Internal Cumbustion Engines	1500	kWe	Carbon Monoxide	Good Combustion Practices	4.38
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Fire Pump Diesel Internal Combustion Engines	252	hp	Carbon Monoxide	Good Combustion Practices	3.3
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATOR SN-62	625	HP	Carbon Monoxide	GOOD OPERATING PRACTICES, LIMITED HOURS OF OPERATION, COMPLIANCE WITH NSPS SUBPART IIII	3.5
*AR-0161	SUN BIO MATERIAL COMPANY	9/23/2019	Emergency Engines	0		Carbon Monoxide	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	3.5
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Carbon Monoxide	OPERATIONAL RESTRICTION OF 50 HR/YR	3.5
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Carbon Monoxide	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	3.5
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Carbon Monoxide		3.5
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Carbon Monoxide		3.5
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Generators, Two 2682 HP EA	0		Carbon Monoxide		3.5
FL-0328	ENI - HOLY CROSS DRILLING PROJECT	10/27/2011	Main Propulsion Engines	0		Carbon Monoxide	Use of good combustion practices based on the current manufacturerâ€™s specifications for these engines, and additional enhanced work practice standards including an engine performance management system and the Diesel Engines with Turbochargers (DEWT) measurement system.	3.3
FL-0332	HIGHLANDS BIOREFINERY AND COGENERATION PLANT	9/23/2011	2000 KW Emergency Equipment	0		Carbon Monoxide	See Pollutant Notes.	3.5
FL-0346	LAUDERDALE PLANT	4/22/2014	Four 3100 kW black start emergency generators	2.32	MMBtu/hr (HHV) per engine	Carbon Monoxide	Good combustion practice	3.5
FL-0346	LAUDERDALE PLANT	4/22/2014	Emergency fire pump engine (300 HP)	29	MMBTU/H	Carbon Monoxide	Good combustion practice.	3.5
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	Three 3300-kW ULSD emergency generators	0		Carbon Monoxide	Use of clean engine	3.5
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	One 422-hp emergency fire pump engine	0		Carbon Monoxide	Use of clean engine technology	3.5
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Two 3300 kW emergency generators	0		Carbon Monoxide	Certified engine	3.5
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Emergency Fire Pump Engine (422 hp)	0		Carbon Monoxide	Certified engine	3.5
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	1,500 kW Emergency Diesel Generator	14.82	MMBtu/hour	Carbon Monoxide	Operate and maintain the engine according to the manufacturer's written instructions	3.5
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	Emergency Fire Pump Engine (347 HP)	8700	gal/year	Carbon Monoxide	Operate and maintain the engine according to the manufacturer's written instructions	3.5
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Emergency Generator	142	GAL/H	Carbon Monoxide	good combustion practices	3.5
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Fire Pump	14	GAL/H	Carbon Monoxide	good combustion practices	3.5
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPLEX	7/12/2013	Emergency Generators	180	GAL/H	Carbon Monoxide	good combustion practices	3.5
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	EMERGENCY GENERATOR ENGINE	750	KW	Carbon Monoxide	TIER 2 ENGINE-BASED,GOOD COMBUSTION PRACTICES (GCP)	3.5
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3755	HP	Carbon Monoxide	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	3.5
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Firewater Pump Engine	373	hp	Carbon Monoxide	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	3.5
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Firewater Pump Engine	420	horsepower	Carbon Monoxide		3.5
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Emergency Engine	1500	kW	Carbon Monoxide		3.5
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Large Emergency Engines (>50kW)	5364	HP	Carbon Monoxide	Good Combustion and Operating Practices.	3.5
MI-0421	GRAYLING PARTICLEBOARD	8/26/2016	Emergency Diesel Generator Engine (EUEMRGRICE in FGRICE)	500	H/YR	Carbon Monoxide	Good design and combustion practices.	3.5
MI-0421	GRAYLING PARTICLEBOARD	8/26/2016	Dieself fire pump engine (EUFIREPUMP in FGRICE)	500	H/YR	Carbon Monoxide	Good design and combustion practices.	3.5
MI-0423	INDECK NILES, LLC	1/4/2017	EUEMENGINE (Diesel fuel emergency engine)	22.68	MMBTU/H	Carbon Monoxide	Good combustion practices and meeting NSPS Subpart IIII requirements.	3.5
MI-0425	GRAYLING PARTICLEBOARD	5/9/2017	EUEMRGRICE1 in FGRICE (Emergency Diesel generator engine)	500	H/YR	Carbon Monoxide	Good design and combustion practices.	3.5
MI-0425	GRAYLING PARTICLEBOARD	5/9/2017	EUEMRGRICE2 in FGRICE (Emergency Diesel Generator Engine)	500	H/YR	Carbon Monoxide	Good design and combustion practices.	3.5
MI-0425	GRAYLING PARTICLEBOARD	5/9/2017	EUFIREPUMP in FGRICE (Diesel fire pump engine)	500	H/YR	Carbon Monoxide	Good design and combustion practices.	3.5
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUEMENGINE (North Plant): Emergency Engine	1341	HP	Carbon Monoxide	Good combustion practices and meeting NSPS Subpart IIII requirements.	3.5
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUEMENGINE (South Plant): Emergency Engine	1341	HP	Carbon Monoxide	Good combustion practices and meeting NSPS IIII requirements.	3.5
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	7/16/2018	EUEMENGINE: Emergency engine	2	MW	Carbon Monoxide	State of the art combustion design.	3.5
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	7/16/2018	EUFPENGINE: Fire pump engine	399	BHP	Carbon Monoxide	State of the art combustion design.	3.5
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD1--A 1500 HP Diesel fueled emergency engine	1500	HP	Carbon Monoxide	Good combustion practices and will be NSPS compliant.	3.5
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD2--A 6000 HP Diesel fuel fired emergency engine	6000	HP	Carbon Monoxide	Good combustion practices and will be NSPS compliant.	3.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY ENGINE 1 THRU 8	29	HP	Carbon Monoxide	PURCHASE OF CERTIFIED ENGINE. HOURS OF OPERATION LIMITED TO 100 HOURS FOR MAINTENANCE AND TESTING.	5.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	FIRE PUMP	500	HP	Carbon Monoxide	ENGINES CERTIFIED TO MEET NSPS, SUBPART IIII. HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR FOR MAINTENANCE AND TESTING.	3.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY GENERATORS 1 THRU 8	757	HP	Carbon Monoxide	ENGINES MUST BE CERTIFIED TO COMPLY WITH NSPS, SUBPART IIII.	3.5
*TX-0872	CONDENSATE SPLITTER FACILITY	10/31/2019	Emergency Generators	0		Carbon Monoxide	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.	0.6
VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	Emergency Diesel generator- 2200 kW	500	hrs/yr	Carbon Monoxide	good combustion practices	3.5
VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	Diesel Fire water pump 376 bhp	500	h/yr	Carbon Monoxide	good combustion practices	0.9
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Carbon Monoxide	Good Combustion Practices/Maintenance	3.5
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY ENGINE	2000	KW	Carbon Monoxide	OPERATIONAL RESTRICTION OF 50 HR/YR	3.5
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	EMERGENCY FIREWATER PUMP ENGINE	135	KW	Carbon Monoxide	OPERATIONAL RESTRICTION OF 50 HR/YR, OPERATE AS REQUIRED FOR FIRE SAFETY TESTING	3.5
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	2683	HP	Carbon Monoxide		3.5
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	EMERGENCY IC ENGINE	182	HP	Carbon Monoxide		3.5
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Generators, Two 2682 HP EA	0		Carbon Monoxide		3.5
FL-0324	PALM BEACH RENEWABLE ENERGY PARK	12/23/2010	250 Kw Emergency Generator	0		Carbon Monoxide	Use of inherently clean ultra low sulfur distillate (ULSD) fuel oil and GCP	3.5
FL-0346	LAUDERDALE PLANT	4/22/2014	Four 3100 kW black start emergency generators	2.32	IBtu/hr (HHV) per en	Carbon Monoxide	Good combustion practice	3.5
FL-0346	LAUDERDALE PLANT	4/22/2014	Emergency fire pump engine (300 HP)	29	MMBTU/H	Carbon Monoxide	Good combustion practice.	3.5
FL-0347	ANADARKO PETROLEUM CORPORATION - EGOM	9/16/2014	Main Propulsion Generator Diesel Engines	9910	hp	Carbon Monoxide	Use of good combustion practices based on the most recent manufacturer's specifications issued for engines and with turbocharger, aftercooler, and high injection pressure	0.8
FL-0354	LAUDERDALE PLANT	8/25/2015	Emergency fire pump engine, 300 HP	29	MMBTU/H	Carbon Monoxide	Low-emitting fuel and certified engine	3.5
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	Three 3300-kW ULSD emergency generators	0		Carbon Monoxide	Use of clean engine	3.5

Summary of RBLC Results for CO Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

CO Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	3/9/2016	One 422-hp emergency fire pump engine	0		Carbon Monoxide	Use of clean engine technology	3.5
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Two 3300 kW emergency generators	0		Carbon Monoxide	Certified engine	3.5
*FL-0363	DANIA BEACH ENERGY CENTER	12/4/2017	Emergency Fire Pump Engine (422 hp)	0		Carbon Monoxide	Certified engine	3.5
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	1,500 kW Emergency Diesel Generator	14.82	MMBtu/hour	Carbon Monoxide	Operate and maintain the engine according to the manufacturer's written instructions	3.5
*FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	7/27/2018	Emergency Fire Pump Engine (347 HP)	8700	gal/year	Carbon Monoxide	Operate and maintain the engine according to the manufacturer's written instructions	3.5
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	150	hp	Carbon Monoxide		3.08
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY GENERATOR	1490	HP	Carbon Monoxide	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	3.5
MD-0045	MATTAWOMAN ENERGY CENTER	11/13/2015	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	305	HP	Carbon Monoxide	USE OF Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	3.5
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED AUXILIARY (EMERGENCY) ENGINES (TWO)	1500	KW	Carbon Monoxide	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES	3.5
MD-0046	KEYS ENERGY CENTER	10/31/2014	Diesel-FIRED FIRE PUMP ENGINE	300	HP	Carbon Monoxide	EXCLUSIVE USE OF Ultra Low Sulfur Diesel FUEL AND GOOD COMBUSTION PRACTICES	3.5
MI-0423	INDECK NILES, LLC	1/4/2017	EUEMENGINE (Diesel fuel emergency engine)	22.68	MMBTU/H	Carbon Monoxide	Good combustion practices and meeting NSPS Subpart IIII requirements.	3.5
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD1--A 1500 HP Diesel fueled emergency engine	1500	HP	Carbon Monoxide	Good combustion practices and will be NSPS compliant.	3.5
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGD2--A 6000 HP Diesel fuel fired emergency engine	6000	HP	Carbon Monoxide	Good combustion practices and will be NSPS compliant.	3.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY ENGINE 1 THRU 8	29	HP	Carbon Monoxide	PURCHASE OF CERTIFIED ENGINE. HOURS OF OPERATION LIMITED TO 100 HOURS FOR MAINTENANCE AND TESTING.	5.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	FIRE PUMP	500	HP	Carbon Monoxide	ENGINES CERTIFIED TO MEET NSPS, SUBPART IIII. HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR FOR MAINTENANCE AND TESTING.	3.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY GENERATORS 1 THRU 8	757	HP	Carbon Monoxide	ENGINES MUST BE CERTIFIED TO COMPLY WITH NSPS, SUBPART IIII.	3.5
*WI-0291	GRAYMONT WESTERN LIME-EDEN	1/28/2019	P04 Emergency Diesel Generator	0.22	mmBTU/hr	Carbon Monoxide	Good Combustion Practices	5

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Emergency Camp Generators	2695	hp	Carbon Monoxide		2.6
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Airstrip Generator Engine	490	hp	Carbon Monoxide		2.6
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Agitator Generator Engine	98	hp	Carbon Monoxide		3.7
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Incinerator Generator Engine	102	hp	Carbon Monoxide		3.7
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Fine Water Pumps	610	hp	Carbon Monoxide		2.6
AK-0082	POINT THOMSON PRODUCTION FACILITY	1/23/2015	Bulk Tank Generator Engines	891	hp	Carbon Monoxide		2.6
*AK-0085	GAS TREATMENT PLANT	8/13/2020	One (1) Black Start Generator Engine	186.6	gph	Carbon Monoxide	Oxidation Catalyst, Good Combustion Practices, and 500 hour limit per year.	3.3
*AK-0085	GAS TREATMENT PLANT	8/13/2020	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generat	19.4	gph	Carbon Monoxide	Good combustion practices, limit operation to 500 hours per year per engine	3.3
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Diesel Fire Pump, One 600 HP	0		Carbon Monoxide		2.6
FL-0332	HIGHLANDS BIOREFINERY AND COGENERATION PLANT	9/23/2011	600 HP Emergency Equipment	0		Carbon Monoxide	See Pollutant Notes.	2.6
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) FIREWATER PUMP Diesel ENGINES	371	BHP, EACH	Carbon Monoxide	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	2.6
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	TWO (2) EMERGENCY Diesel GENERATORS	1006	HP EACH	Carbon Monoxide	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	2.6
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	EMERGENCY Diesel GENERATOR	2012	HP	Carbon Monoxide	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	2.6
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.61
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.6
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.6
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.61
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.6
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.61
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.6
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.6
IN-0263	MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3600	HP EACH	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-02 - North Water System Emergency Generator	2922	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-03 - South Water System Emergency Generator	2922	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-04 - Emergency Fire Water Pump	920	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-01 - Melt Shop Emergency Generator	260	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency Generator	190	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-07 - Air Separation Plant Emergency Generator	700	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-01 - Caster Emergency Generator	2922	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-03 - Rolling Mill Emergency Generator	440	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-04 - IT Emergency Generator	190	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-05 - Radio Tower Emergency Generator	61	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	3.73
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	Carbon Monoxide	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Carbon Monoxide	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	2.6
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Carbon Monoxide	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	2.6
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Firewater Pumps	634	kW	Carbon Monoxide	Good Combustion and Operating Practices.	3.7
*LA-0346	GULF COAST METHANOL COMPLEX	1/4/2018	emergency generators (4 units)	13410	hp (each)	Carbon Monoxide	Comply with standards of 40 CFR 60 Subpart JJJJ	4
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Emergency Engine/Generator	7.4	MMBTU/H	Carbon Monoxide		2.6
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	1/30/2014	Fire Pump Engine	2.7	MMBTU/H	Carbon Monoxide		2.6
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Carbon Monoxide	USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND HOURS OF OPERATION LIMITED TO 100 HOU	2.6
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Carbon Monoxide	USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND HOURS OF OPERATION LIMITED TO 100 HOU	2.6
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES AND DESIGNED TO MEET EMISSION LIMIT	2.6
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES AND DESIGNED TO MEET EMISSION LIMIT	3
MI-0406	RENAISSANCE POWER LLC	11/1/2013	FG-EMGEN7-8; Two (2) 1,000kW Diesel-fueled emergency reciprocating	1000	kW	Carbon Monoxide	Good combustion practices.	2.6
MI-0423	INDECK NILES, LLC	1/4/2017	EUFPENGINE (Emergency engine--Diesel fire pump)	1.66	MMBTU/H	Carbon Monoxide	Good combustion practices and meeting NSPS Subpart IIII requirements.	2.6
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	6/29/2018	EUFPENGINE (North Plant): Fire pump engine	300	HP	Carbon Monoxide	Good combustion practices and meeting NSPS Subpart IIII requirements.	2.6

Summary of RBLC Results for CO Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

CO Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGNG1--A 1500 HP Natural Gas fueled emergency engine	1500	HP	Carbon Monoxide	Burn Natural Gas and be NSPS compliant	4
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGNG2	6000	HP	Carbon Monoxide	Burn Natural Gas and be NSPS compliant.	4
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUFPRICE--A 315 HP Diesel fueled emergency engine	2.5	MMBTU/H	Carbon Monoxide	Good combustion practices.	2.6
NY-0104	CPV VALLEY ENERGY CENTER	8/1/2013	Emergency generator	0		Carbon Monoxide	Good combustion practice.	0.45
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Emergency Generator	0		Carbon Monoxide		0.13
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Fire Pump	0		Carbon Monoxide		0.5
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	Fire pump engine	15	gal/hr	Carbon Monoxide		0.5
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0		Carbon Monoxide		0.6
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0		Carbon Monoxide		2.61
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Fire Pump Engine	0		Carbon Monoxide		2.61
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0		Carbon Monoxide		0.26
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Fire Pump Engine	0		Carbon Monoxide		1
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE EN	4/10/2014	Emergency Diesel Fire Pump	0		Carbon Monoxide		2.6
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE EN	4/10/2014	Emergency Diesel Generator	0		Carbon Monoxide		2.6
TX-0728	PEONY CHEMICAL MANUFACTURING FACILITY	4/1/2015	Emergency Diesel Generator	1500	hp	Carbon Monoxide	Minimized hours of operations Tier II engine	0.0126
*TX-0872	CONDENSATE SPLITTER FACILITY	10/31/2019	Emergency Generators	0		Carbon Monoxide	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.	0.6
VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	Emergency propane generator 100 kW	500	hrs/yr	Carbon Monoxide	good combustion practices including use of clean fuel	4
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED WATER PUMP 376 bph (1)	0		Carbon Monoxide	Good Combustion Practices/Maintenance	2.6
VA-0325	GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Carbon Monoxide	Good Combustion Practices/Maintenance	4
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Carbon Monoxide	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	2.6
VA-0328	C4GT, LLC	4/26/2018	Emergency Fire Water Pump	500	HR/YR	Carbon Monoxide	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	2.6
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emergency Diesel Generator - 300 kW	500	H/YR	Carbon Monoxide	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	2.6
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emegency Fire Water Pump	500	HR/YR	Carbon Monoxide	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	2.6
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	EMERGENCY IC ENGINE	550	KW	Carbon Monoxide	EXHAUST VENTED TO A OXIDATION CATALYST SYSTEM, OPERATIONAL LIMIT OF 50 HRS/YR	1
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	EMERGENCY FIREWATER PUMP ENGINE	288	HP	Carbon Monoxide	EQUIPPED W/ A TURBOCHARGER AND AN INTERCOOLER/AFTERCOOLER	0.447
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	12/23/2010	Emergency Diesel Fire Pump, One 600 HP	0		Carbon Monoxide		2.6
FL-0324	PALM BEACH RENEWABLE ENERGY PARK	12/23/2010	Two emergency Diesel firewater pump engines	250	HP	Carbon Monoxide	demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII	2.6
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.61
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.6
IN-0234	GRAIN PROCESSING CORPORATION	12/8/2015	EMERGENCY FIRE PUMP ENGINE	0		Carbon Monoxide	GOOD COMBUSTION PRACTICES	2.01
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	250	hp	Carbon Monoxide		3.08
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Spark ignition RICE emergency AC generators	450	kW	Carbon Monoxide		4
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Carbon Monoxide	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	2.6
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Carbon Monoxide	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	2.6
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY GENERATOR	1500	KW	Carbon Monoxide	USE OF Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	2.6
MD-0041	CPV ST. CHARLES	4/23/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	300	HP	Carbon Monoxide	USE OF Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	2.6
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Carbon Monoxide	USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR	2.6
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY Diesel ENGINE FOR FIRE WATER PUMP	477	HP	Carbon Monoxide	USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES AND HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR	2.6
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES AND DESIGNED TO MEET EMISSION LIMIT	2.6
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Carbon Monoxide	GOOD COMBUSTION PRACTICES AND DESIGNED TO MEET EMISSION LIMIT	3
MI-0410	THETFORD GENERATING STATION	7/25/2013	EU-FPENGINE: Diesel fuel fired emergency backup fire pump	315	hp nameplate	Carbon Monoxide	Proper combustion design and Ultra Low Sulfur Diesel fuel.	2.6
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/4/2013	Emergency Engine --Diesel Fire Pump (EUFPENGINE)	165	HP	Carbon Monoxide	Good combustion practices	3.7
MI-0423	INDECK NILES, LLC	1/4/2017	EUFPENGINE (Emergency engine--Diesel fire pump)	1.66	MMBTU/H	Carbon Monoxide	Good combustion practices and meeting NSPS Subpart IIII requirements.	2.6
MI-0424	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/5/2016	EUFPENGINE (Emergency engine--Diesel fire pump)	500	H/YR	Carbon Monoxide	Good combustion practices.	3.7
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUFPRICE--A 315 HP Diesel fueled emergency engine	2.5	MMBTU/H	Carbon Monoxide	Good combustion practices.	2.6
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Black start generator	3000	KW	Carbon Monoxide	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	2.6
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Emergency fire pump	460	hp	Carbon Monoxide	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	0.53
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Generator Engines	0		Carbon Monoxide		2.61
PA-0310	CPV FAIRVIEW ENERGY CENTER	9/2/2016	Emergency Fire Pump Engine	0		Carbon Monoxide		2.61
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Carbon Monoxide		2.6
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Carbon Monoxide		2.6
VA-0328	C4GT, LLC	4/26/2018	Emergency Diesel GEN	500	H/YR	Carbon Monoxide	good combustion practices and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	2.6

Summary of RBLC Results for VOC Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

VOC Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/kw-hr)
AR-0140	BIG RIVER STEEL LLC	9/18/2013	EMERGENCY GENERATOR SN-62	625	HP	Volatile Organic Compounds (VOC)	GOOD OPERATING PRACTICES, LIMITED HOURS OF OPERATION, COMPLIANCE WITH NSPS SUBPART IIII	19
*AR-0161	SUN BIO MATERIAL COMPANY	9/23/2019	Emergency Engines	0		Volatile Organic Compounds (VOC)	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	1.9
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Emergency Generator	142	GAL/H	Volatile Organic Compounds (VOC)	good combustion practices	0.4
IA-0105	IOWA FERTILIZER COMPANY	10/26/2012	Fire Pump	14	GAL/H	Volatile Organic Compounds (VOC)	good combustion practices	0.25
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPLEX	7/12/2013	Emergency Generators	180	GAL/H	Volatile Organic Compounds (VOC)	good combustion practices	4
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	EMERGENCY GENERATOR ENGINE	750	KW	Volatile Organic Compounds (VOC)	TIER 2 ENGINE-BASED,GOOD COMBUSTION PRACTICES (GCP)	6.4
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	FIRE PUMP ENGINE	235	KW	Volatile Organic Compounds (VOC)	TIER 3 ENGINE-BASED,GOOD COMBUSTION PRACTICES (GCP)	4
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Emergency Generator	3755	HP	Volatile Organic Compounds (VOC)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.4
IL-0114	CRONUS CHEMICALS, LLC	9/5/2014	Firewater Pump Engine	373	hp	Volatile Organic Compounds (VOC)	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.4
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Large Emergency Engines (>50kW)	5364	HP	Volatile Organic Compounds (VOC)	Good combustion and operating practices.	0.79
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY ENGINE 1 THRU 8	29	HP	Volatile Organic Compounds (VOC)	PURCHASE OF CERTIFIED ENGINES. HOURS OF OPERATION LIMITED TO 100 HOURS FOR MAINTENANCE AND TESTING.	7.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	FIRE PUMP	500	HP	Volatile Organic Compounds (VOC)	CERTIFIED ENGINES THAT COMPLY WITH NSPS, SUBPART IIII. HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR FOR MAINTENANCE AND TESTING.	4
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY GENERATORS 1 THRU 8	757	HP	Volatile Organic Compounds (VOC)	PURCHASE ENGINES CERTIFIED TO COMPLY WITH NSPS, SUBPART IIII.	4
SC-0159	US10 FACILITY	7/9/2012	EMERGENCY GENERATORS, GEN1, GEN2	1000	KW	Volatile Organic Compounds (VOC)	BACT HAS BEEN DETERMINED TO BE COMPLIANCE WITH NSPS, SUBPART IIII, 40 CFR60.4202 AND 40 CFR60.4205.	6.4
*TX-0872	CONDENSATE SPLITTER FACILITY	10/31/2019	Emergency Generators	0		Volatile Organic Compounds (VOC)	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.	0.12
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED EMERGENCY GENERATOR 3000 kW (1)	0		Volatile Organic Compounds (VOC)	Good Combustion Practices/Maintenance	6.4
*WI-0284	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	Diesel-Fired Emergency Generators	0		Volatile Organic Compounds (VOC)	Good Combustion Practices	0.56
*WI-0286	SIO INTERNATIONAL WISCONSIN, INC. -ENERGY PLANT	4/24/2018	P42 -Diesel Fired Emergency Generator	0		Volatile Organic Compounds (VOC)	Good Combustion Practices	0.56
LA-0328	PLAQUEMINES PLANT 1	5/2/2018	Emergency Diesel Engine Pump P-39A	375	HP	Volatile Organic Compounds (VOC)	Good combustion practices and NSPS Subpart IIII	4
LA-0328	PLAQUEMINES PLANT 1	5/2/2018	Emergency Diesel Engine Pump P-39B	300	HP	Volatile Organic Compounds (VOC)	Good combustion practices and NSPS Subpart IIII	4
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY ENGINE 1 THRU 8	29	HP	Volatile Organic Compounds (VOC)	PURCHASE OF CERTIFIED ENGINES. HOURS OF OPERATION LIMITED TO 100 HOURS FOR MAINTENANCE AND TESTING.	7.5
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	FIRE PUMP	500	HP	Volatile Organic Compounds (VOC)	CERTIFIED ENGINES THAT COMPLY WITH NSPS, SUBPART IIII. HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR FOR MAINTENANCE AND TESTING.	4
SC-0113	PYRAMAX CERAMICS, LLC	2/8/2012	EMERGENCY GENERATORS 1 THRU 8	757	HP	Volatile Organic Compounds (VOC)	PURCHASE ENGINES CERTIFIED TO COMPLY WITH NSPS, SUBPART IIII.	4

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
*AK-0085	GAS TREATMENT PLANT	8/13/2020	One (1) Black Start Generator Engine	186.6	gph	Volatile Organic Compounds (VOC)	Oxidation Catalyst, Good combustion practices, and limit operation to 500 hours per year.	0.18
*AK-0085	GAS TREATMENT PLANT	8/13/2020	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generato	19.4	gph	Volatile Organic Compounds (VOC)	Good combustion practices, ULSD, and limit operation to 500 hours per year.	0.19
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.31
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.141
IN-0234	GRAIN PROCESSING CORPORATION	12/8/2015	EMERGENCY FIRE PUMP ENGINE	0		Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.05
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	150	hp	Volatile Organic Compounds (VOC)		1.134
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	2/23/2018	Emergency Diesel Generators	250	hp	Volatile Organic Compounds (VOC)		1.134
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Spark ignition RICE emergency AC generators	450	kW	Volatile Organic Compounds (VOC)		1
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	3/31/2016	Compression ignition RICE emergency fire pump	197	HP	Volatile Organic Compounds (VOC)		1.14
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	636	HP	Volatile Organic Compounds (VOC)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	1
*KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	636	HP	Volatile Organic Compounds (VOC)	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	1
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Volatile Organic Compounds (VOC)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	1
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Volatile Organic Compounds (VOC)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	1
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Volatile Organic Compounds (VOC)	USE ONLY ULSD, GOOD COMBUSTION PRACTICES, AND DESIGNED TO ACHIEVE EMISSION LIMIT	4.8
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Volatile Organic Compounds (VOC)	USE ONLY ULSD, GOOD COMBUSTION PRACTICES, AND DESIGNED TO ACHIEVE EMISSION LIMIT	3
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/4/2013	Emergency Engine--Natural Gas (EUNGENGINE)	1000	kW	Volatile Organic Compounds (VOC)	Oxidation catalyst and good combustion practices	0.5
MI-0424	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	12/5/2016	EUNGENGINE (Emergency engine--Natural Gas)	500	H/YR	Volatile Organic Compounds (VOC)	Oxidation catalyst and good combustion practices.	0.5
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGNG1--A 1500 HP Natural Gas fueled emergency engine	1500	HP	Volatile Organic Compounds (VOC)	Burn Natural Gas and be NSPS compliant	1
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGNG2	6000	HP	Volatile Organic Compounds (VOC)	Burn Natural Gas and be NSPS compliant.	1
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Black start generator	3000	KW	Volatile Organic Compounds (VOC)	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	0.11
NY-0103	CRICKET VALLEY ENERGY CENTER	2/3/2016	Emergency fire pump	460	hp	Volatile Organic Compounds (VOC)	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	0.1
OK-0175	WILDHORSE TERMINAL	6/29/2017	Emergency Use Engines > 500 HP	0		Volatile Organic Compounds (VOC)	Good combustion practices. Certified to meet EPA Tier 3 engine standards. Shall be limited to operate at no more than 500 hr/yr.	3
OK-0175	WILDHORSE TERMINAL	6/29/2017	Emergency Use Engine less than or equal to 500 HP	0		Volatile Organic Compounds (VOC)	Good combustion practices, certified to meet EPA Tier 3 engine standards. Gen-1, FP-1, and FP-2 shall be limited to operate no more than 500 hr/yr.	3
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Volatile Organic Compounds (VOC)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Volatile Organic Compounds (VOC)		0.15
*WI-0261	ENBRIDGE ENERGY - SUPERIOR TERMINAL	6/12/2014	EG7 - Diesel Emergency Electric Generator w/ tank	197	BHP	Volatile Organic Compounds (VOC)	NSPS engine [Tier 3 emergency engine]. EG7 Storage tank, conventional fuel oil storage tank, good operating practices; limiting leakage, spills. (FT01). Engine limited to 200 hours / year (total) and NSPS requirements.	3.75

Summary of RBLC Results for VOC Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

VOC Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/hp-hr)
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.31
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.141
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.141
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY GENERATOR	4690	B-HP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.31
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	Diesel-FIRED EMERGENCY WATER PUMP	481	BHP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.141
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	Diesel FIRED EMERGENCY GENERATOR	3600	BHP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.31
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FIRE PUMP	500	HP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.141
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	RAW WATER PUMP	500	HP	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.141
IN-0263	MIDWEST FERTILIZER COMPANY LLC	3/23/2017	EMERGENCY GENERATORS (EU014A AND EU-014B)	3600	HP EACH	Volatile Organic Compounds (VOC)	GOOD COMBUSTION PRACTICES	0.35
*KY-0109	FRITZ WINTER NORTH AMERICA, LP	10/24/2016	Emergency Generators #1, #2, & #3 (EU72, EU73, & EU74)	53.6	gal/hr	Volatile Organic Compounds (VOC)	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.	4.77
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY Diesel GENERATOR	1250	HP	Volatile Organic Compounds (VOC)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	1
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	EMERGENCY FIRE PUMP	350	HP	Volatile Organic Compounds (VOC)	Ultra Low Sulfur Diesel AND GOOD COMBUSTION PRACTICES	1
LA-0331	CALCASIEU PASS LNG PROJECT	9/21/2018	Firewater Pumps	634	kW	Volatile Organic Compounds (VOC)	Good combustion and operating practices.	0.44
*LA-0346	GULF COAST METHANOL COMPLEX	1/4/2018	emergency generators (4 units)	13410	hp (each)	Volatile Organic Compounds (VOC)	Comply with standards of 40 CFR 60 Subpart JJJJ	1
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	EMERGENCY GENERATOR	1550	HP	Volatile Organic Compounds (VOC)	USE ONLY ULSD, GOOD COMBUSTION PRACTICES, AND DESIGNED TO ACHIEVE EMISSION LIMIT	4.8
MD-0044	COVE POINT LNG TERMINAL	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	350	HP	Volatile Organic Compounds (VOC)	USE ONLY ULSD, GOOD COMBUSTION PRACTICES, AND DESIGNED TO ACHIEVE EMISSION LIMIT	3
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGNG1--A 1500 HP Natural Gas fueled emergency engine	1500	HP	Volatile Organic Compounds (VOC)	Burn Natural Gas and be NSPS compliant	1
*MI-0441	LBWL--ERICKSON STATION	12/21/2018	EUEMGNG2	6000	HP	Volatile Organic Compounds (VOC)	Burn Natural Gas and be NSPS compliant.	1
OK-0175	WILDHORSE TERMINAL	6/29/2017	Emergency Use Engines > 500 HP	0		Volatile Organic Compounds (VOC)	Good combustion practices. Certified to meet EPA Tier 3 engine standards. Shall be limited to operate at no more than 500 hr/yr.	3
OK-0175	WILDHORSE TERMINAL	6/29/2017	Emergency Use Engine less than or equal to 500 HP	0		Volatile Organic Compounds (VOC)	Good combustion practices, certified to meet EPA Tier 3 engine standards. Gen-1, FP-1, and FP-2 shall be limited to operate no more than 500 hr/yr.	3
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Emergency Generator	0		Volatile Organic Compounds (VOC)		0.01
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	Fire Pump	0		Volatile Organic Compounds (VOC)		0.1
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	Fire pump engine	15	gal/hr	Volatile Organic Compounds (VOC)		0.12
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	12/23/2015	2000 kW Emergency Generator	0		Volatile Organic Compounds (VOC)		0.22
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Emergency Generator	0		Volatile Organic Compounds (VOC)		0.02
PA-0311	MOXIE FREEDOM GENERATION PLANT	9/1/2015	Fire Pump Engine	0		Volatile Organic Compounds (VOC)		0.2
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Fire Pump	0		Volatile Organic Compounds (VOC)		0.15
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Emergency Diesel Generator	0		Volatile Organic Compounds (VOC)		0.15
*TX-0879	MOTIVA PORT ARTHUR TERMINAL	2/19/2020	Emergency Firewater Engine	0		Volatile Organic Compounds (VOC)	Meeting the requirements of 40 CFR Part 60, Subpart IIII. Firing ultra-low sulfur Diesel fuel (no more than 15 ppm sulfur by weight). Limited to 100 hrs/yr of non-emergency operation. Have a non-resettable runtime meter.	0.1
VA-0325	GREENSVILLE POWER STATION	6/17/2016	Diesel-FIRED WATER PUMP 376 bph (1)	0		Volatile Organic Compounds (VOC)	Good Combustion Practices/Maintenance	3
VA-0325	GREENSVILLE POWER STATION	6/17/2016	PROPANE-FIRED EMERGENCY GENERATORS 150 kW (2)	0		Volatile Organic Compounds (VOC)	Good combustion practices	1
*VA-0332	CHICKAHOMINY POWER LLC	6/24/2019	Emegency Fire Water Pump	500	HR/YR	Volatile Organic Compounds (VOC)	good combustion practices, high efficiency design, and the use of Ultra Low Sulfur Diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	0.11

Summary of RBLC Results for SO_2 Emissions from Emergency Engines
Process Type: 17.110 Large Internal Combustion Engines (>500 HP) - Fuel Oil and 17.210 Small Internal Combustion Engines (<500 HP) - Fuel Oil

SO_2 Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (g/bHP-h)
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY GENERATOR 1	2250	KW	Sulfur Dioxide (SO2)	USE OF ULTRA-LOW DIESEL SULFUR FUEL, LIMITED HOURS OF OPERATION AND DESIGNED TO MEET NSPS SUBPART IIII LIMITS	0.006
*MD-0042	WILDCAT POINT GENERATION FACILITY	4/8/2014	EMERGENCY DIESEL ENGINE FOR FIRE WATER PUMP	477	HP	Sulfur Dioxide (SO2)	USE OF ULTRA-LOW DIESEL SULFUR FUEL, LIMITED HOURS OF OPERATION AND DESIGNED TO MEET SUBPART IIII LIMITS	0.0049
RBLC-ID	**Facility Name**	**Permit Issuance Date**	**Process Name**	**Throughput**	**Throughput Units**	**Pollutant**	**Control Method Description**	**Emission Limit (ppmw)**
*AK-0085	GAS TREATMENT PLANT	8/13/2020	One (1) Black Start Generator Engine	186.6	gph	Sulfur Dioxide (SO2)	Good combustion practices, ULSD, and limit operation to 500 hours per year.	15
*AK-0085	GAS TREATMENT PLANT	8/13/2020	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	19.4	gph	Sulfur Dioxide (SO2)	Good combustion practices, ULSD, and limit operation to 500 hours per year.	15
*TX-0876	PORT ARTHUR ETHANE CRACKER UNIT	2/6/2020	Emergency generator	0		Sulfur Dioxide (SO2)	Tier 4 exhaust emission standards specified in 40 CFR Â§ 1039.101, limited to 100 hours per year of non-emergency operation	15

Summary of RBLC Results for Particulate Emissions from Roadways
Process Type: 99.140 - Paved Roads and 99.150 - Unpaved Roads

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (% Control)
IN-0166	INDIANA GASIFICATION, LLC	6/27/2012	FUGITIVE DUST FROM PAVED ROADS	0		Particulate matter, filterable (FPM)	PAVING ALL PLANT HAUL ROADS, USE OF WET OR CHEMICAL SUPPRESSION, AND PROMPT CLEANUP OF ANY SPILLED MATERIALS.	90
IN-0166	INDIANA GASIFICATION, LLC	6/27/2012	FUGITIVE DUST FROM PAVED ROADS	0		Particulate matter, total ≤ 10 µ (TPM10)	PAVING ALL PLANT HAUL ROADS, USE OF WET OR CHEMICAL SUPPRESSION, AND PROMPT CLEANUP OF ANY SPILLED MATERIALS.	90
IN-0166	INDIANA GASIFICATION, LLC	6/27/2012	FUGITIVE DUST FROM PAVED ROADS	0		Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVING ALL PLANT HAUL ROADS, USE OF WET OR CHEMICAL SUPPRESSION, AND PROMPT CLEANUP OF ANY SPILLED MATERIALS.	90
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, filterable (FPM)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 10 µ (TPM10)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	PAVED ROADWAYS AND PARKING LOTS WITH PUBLIC ACCESS	17160	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVE ALL PLANT HAUL ROADS, DAILY SWEEPING AND WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL	90
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	PAVED ROADWAYS AND PARKING LOTS WITH PUBLIC ACCESS	17160	VEHICLE MILES TRAVELED	Particulate matter, filterable (FPM)	PAVE ALL PLANT HAUL ROADS, DAILY SWEEPING AND WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL	90
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	PAVED ROADWAYS AND PARKING LOTS WITH PUBLIC ACCESS	17160	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 10 µ (TPM10)	PAVE ALL PLANT HAUL ROADS, DAILY SWEEPING AND WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL	90
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, filterable (FPM)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 10 µ (TPM10)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0166	INDIANA GASIFICATION, LLC	6/27/2012	FUGITIVE DUST FROM PAVED ROADS	0		Particulate matter, filterable (FPM)	PAVING ALL PLANT HAUL ROADS, USE OF WET OR CHEMICAL SUPPRESSION, AND PROMPT CLEANUP OF ANY SPILLED MATERIALS.	90
IN-0166	INDIANA GASIFICATION, LLC	6/27/2012	FUGITIVE DUST FROM PAVED ROADS	0		Particulate matter, total ≤ 10 µ (TPM10)	PAVING ALL PLANT HAUL ROADS, USE OF WET OR CHEMICAL SUPPRESSION, AND PROMPT CLEANUP OF ANY SPILLED MATERIALS.	90
IN-0166	INDIANA GASIFICATION, LLC	6/27/2012	FUGITIVE DUST FROM PAVED ROADS	0		Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVING ALL PLANT HAUL ROADS, USE OF WET OR CHEMICAL SUPPRESSION, AND PROMPT CLEANUP OF ANY SPILLED MATERIALS.	90
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, filterable (FPM)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 10 µ (TPM10)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0173	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	PAVED ROADWAYS AND PARKING LOTS WITH PUBLIC ACCESS	17160	VEHICLE MILES TRAVELED	Particulate matter, filterable (FPM)	PAVE ALL PLANT HAUL ROADS, DAILY SWEEPING AND WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL	90
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	PAVED ROADWAYS AND PARKING LOTS WITH PUBLIC ACCESS	17160	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 10 µ (TPM10)	PAVE ALL PLANT HAUL ROADS, DAILY SWEEPING AND WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL	90
IN-0179	OHIO VALLEY RESOURCES, LLC	9/25/2013	PAVED ROADWAYS AND PARKING LOTS WITH PUBLIC ACCESS	17160	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVE ALL PLANT HAUL ROADS, DAILY SWEEPING AND WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL	90
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, filterable (FPM)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 10 µ (TPM10)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90
IN-0180	MIDWEST FERTILIZER CORPORATION	6/4/2014	FUGITIVE DUST FROM PAVED ROADS AND PARKING LOTS	10402	VEHICLE MILES TRAVELED	Particulate matter, total ≤ 2.5 µ (TPM2.5)	PAVE ALL HAUL ROADS, DAILY SWEEPING WITH WET SUPPRESSION, PROMPT CLEANUP OF ANY SPILLED MATERIAL.	90

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (% Opacity)
IL-0129	CPV THREE RIVERS ENERGY CENTER	7/30/2018	Roadways	0		Particulate matter, total (TPM)	Paving is required for roads used by trucks transporting bulk materials.	10
IL-0129	CPV THREE RIVERS ENERGY CENTER	7/30/2018	Roadways	0		Particulate matter, total (TPM)	Paving is required for roads used by trucks transporting bulk materials.	10
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Roadways	0		Particulate matter, total (TPM)		10
IL-0130	JACKSON ENERGY CENTER	12/31/2018	Roadways	0		Particulate matter, total (TPM)		10

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (Lb/VMT)
SC-0181	RESOLUTE FP US INC. - CATAWBA LUMBER MILL	11/3/2017	Roads	0		Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	Good housekeeping practices.	0.01
SC-0181	RESOLUTE FP US INC. - CATAWBA LUMBER MILL	11/3/2017	Roads	0		Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	Good housekeeping practices.	0.01
SC-0181	RESOLUTE FP US INC. - CATAWBA LUMBER MILL	11/3/2017	Roads	0		Particulate matter, filterable ≤ 10 µ (FPM10)	Good housekeeping practices.	0.03
SC-0181	RESOLUTE FP US INC. - CATAWBA LUMBER MILL	11/3/2017	Roads	0		Particulate matter, filterable ≤ 10 µ (FPM10)	Good housekeeping practices.	0.03
SC-0181	RESOLUTE FP US INC. - CATAWBA LUMBER MILL	11/3/2017	Roads	0		Particulate matter, filterable (FPM)	Good housekeeping practices.	0.13
SC-0181	RESOLUTE FP US INC. - CATAWBA LUMBER MILL	11/3/2017	Roads	0		Particulate matter, filterable (FPM)	Good housekeeping practices.	0.13

Summary of RBLC Results for Particulate Emissions from Roadways
Process Type: 99.140 - Paved Roads and 99.150 - Unpaved Roads

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (T/YR)
*OH-0380	AMG VANADIUM LLC	43684	Paved Roadways (F001)	31689	MI/YR	Particulate matter, total ≤ 2.5 µ (TPM2.5)	Pave all in-plant haul roads and parking areas. Implement best management practices including posting and limiting vehicle speeds to 15 miles per hour in production areas. Utilize a vacuum sweeper as needed based on the daily inspections	0.01
*OH-0380	AMG VANADIUM LLC	43684	Paved Roadways (F001)	31689	MI/YR	Particulate matter, total ≤ 2.5 µ (TPM2.5)	Pave all in-plant haul roads and parking areas. Implement best management practices including posting and limiting vehicle speeds to 15 miles per hour in production areas. Utilize a vacuum sweeper as needed based on the daily inspections	0.01
*OH-0380	AMG VANADIUM LLC	43684	Paved Roadways (F001)	31689	MI/YR	Particulate matter, total ≤ 10 µ (TPM10)	Pave all in-plant haul roads and parking areas. Implement best management practices including posting and limiting vehicle speeds to 15 miles per hour in production areas. Utilize a vacuum sweeper as needed based on the daily inspections	0.06
*OH-0380	AMG VANADIUM LLC	43684	Paved Roadways (F001)	31689	MI/YR	Particulate matter, total ≤ 10 µ (TPM10)	Pave all in-plant haul roads and parking areas. Implement best management practices including posting and limiting vehicle speeds to 15 miles per hour in production areas. Utilize a vacuum sweeper as needed based on the daily inspections	0.06
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	43455	Facility Roadways (F001)	182865	MI/YR	Particulate matter, total ≤ 2.5 µ (TPM2.5)	i.Pave all in-plant haul roads and parking areas; ii.Implement best management practices including posting and limiting vehicle speeds to 20 miles per hour and water spraying or sweeping as needed based on the daily inspections conducted	0.09
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	43455	Facility Roadways (F001)	182865	MI/YR	Particulate matter, total ≤ 2.5 µ (TPM2.5)	i.Pave all in-plant haul roads and parking areas; ii.Implement best management practices including posting and limiting vehicle speeds to 20 miles per hour and water spraying or sweeping as needed based on the daily inspections conducted	0.09
OH-0376	IRONUNITS LLC - TOLEDO HBI	43140	Paved roads (F001)	0		Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	water flushing and sweeping	0.15
OH-0376	IRONUNITS LLC - TOLEDO HBI	43140	Paved roads (F001)	0		Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	water flushing and sweeping	0.15
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	43455	Facility Roadways (F001)	182865	MI/YR	Particulate matter, total ≤ 10 µ (TPM10)	i.Pave all in-plant haul roads and parking areas; ii.Implement best management practices including posting and limiting vehicle speeds to 20 miles per hour and water spraying or sweeping as needed based on the daily inspections conducted	0.38
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	43455	Facility Roadways (F001)	182865	MI/YR	Particulate matter, total ≤ 10 µ (TPM10)	i.Pave all in-plant haul roads and parking areas; ii.Implement best management practices including posting and limiting vehicle speeds to 20 miles per hour and water spraying or sweeping as needed based on the daily inspections conducted	0.38
OH-0376	IRONUNITS LLC - TOLEDO HBI	43140	Paved roads (F001)	0		Particulate matter, filterable ≤ 10 µ (FPM10)	water flushing and sweeping	0.63
OH-0376	IRONUNITS LLC - TOLEDO HBI	43140	Paved roads (F001)	0		Particulate matter, filterable ≤ 10 µ (FPM10)	water flushing and sweeping	0.63
*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	43735	Plant Roadways & Parking Areas (F005)	686399	MI/YR	Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.	0.75
*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	43735	Plant Roadways & Parking Areas (F005)	686399	MI/YR	Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.	0.75
OH-0332	MIDDLETOWN COKE COMPANY	40218	Roadways and Parking areas	0		Particulate matter, fugitive	Control measures (watering etc.) when necessary	1.08
OH-0332	MIDDLETOWN COKE COMPANY	40218	Roadways and Parking areas	0		Particulate matter, fugitive	Control measures (watering etc.) when necessary	1.08
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	43455	Facility Roadways (F001)	182865	MI/YR	Particulate matter, fugitive	i.Pave all in-plant haul roads and parking areas; ii.Implement best management practices including posting and limiting vehicle speeds to 20 miles per hour and water spraying or sweeping as needed based on the daily inspections conducted	1.88
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	43455	Facility Roadways (F001)	182865	MI/YR	Particulate matter, fugitive	i.Pave all in-plant haul roads and parking areas; ii.Implement best management practices including posting and limiting vehicle speeds to 20 miles per hour and water spraying or sweeping as needed based on the daily inspections conducted	1.88
OH-0368	PALLAS NITROGEN LLC	42844	Paved Roadways (F001)	70000	MI/YR	Particulate matter, total ≤ 10 µ (TPM10)	i.Paving of all plant roads that will be used for raw material and product transport; ii.Covering, at all times, of open-bodied vehicles when transporting materials likely to become airborne; and iii.Compliance with the opacity limits. Specifically, additional mitigation measures potentially including road sweeping or wet suppression will be implemented on an as-needed basis determined through visual observation of emissions associated with truck movements on the plant site.	2.6
OH-0368	PALLAS NITROGEN LLC	42844	Paved Roadways (F001)	70000	MI/YR	Particulate matter, total ≤ 10 µ (TPM10)	i.Paving of all plant roads that will be used for raw material and product transport; ii.Covering, at all times, of open-bodied vehicles when transporting materials likely to become airborne; and iii.Compliance with the opacity limits. Specifically, additional mitigation measures potentially including road sweeping or wet suppression will be implemented on an as-needed basis determined through visual observation of emissions associated with truck movements on the plant site.	2.6
*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	43735	Plant Roadways & Parking Areas (F005)	686399	MI/YR	Particulate matter, filterable ≤ 10 µ (FPM10)	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.	3.55

Summary of RBLC Results for Particulate Emissions from Roadways
Process Type: 99.140 - Paved Roads and 99.150 - Unpaved Roads

PM Emission Limits

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (T/YR)
*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	43735	Plant Roadways & Parking Areas (F005)	686399	MI/YR	Particulate matter, filterable ≤ 10 µ (FPM10)	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.	3.55
OH-0368	PALLAS NITROGEN LLC	42844	Paved Roadways (F001)	70000	MI/YR	Particulate matter, fugitive	i.Paving of all plant roads that will be used for raw material and product transport; ii.Covering, at all times, of open-bodied vehicles when transporting materials likely to become airborne; and iii.Compliance with the opacity limits. Specifically, additional mitigation measures potentially including road sweeping or wet suppression will be implemented on an as-needed basis determined through visual observation of emissions associated with truck movements on the plant site.	13.2
OH-0368	PALLAS NITROGEN LLC	42844	Paved Roadways (F001)	70000	MI/YR	Particulate matter, fugitive	i.Paving of all plant roads that will be used for raw material and product transport; ii.Covering, at all times, of open-bodied vehicles when transporting materials likely to become airborne; and iii.Compliance with the opacity limits. Specifically, additional mitigation measures potentially including road sweeping or wet suppression will be implemented on an as-needed basis determined through visual observation of emissions associated with truck movements on the plant site.	13.2
*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	43735	Plant Roadways & Parking Areas (F005)	686399	MI/YR	Particulate matter, fugitive	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.	16.74
*OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	43735	Plant Roadways & Parking Areas (F005)	686399	MI/YR	Particulate matter, fugitive	Paved: sweeping, vacuuming, washing with water, and posted speed limits to comply with the applicable requirements. Unpaved: use of dust suppressant as necessary to comply with the applicable requirements.	16.74
OH-0345	DP&L J.M. STUART GENERATING STATION	40771	Paved Roadways	0		Particulate matter, fugitive	watering, use of reduced speed, good housekeeping	110.96
OH-0345	DP&L J.M. STUART GENERATING STATION	40771	Paved Roadways	0		Particulate matter, fugitive	watering, use of reduced speed, good housekeeping	110.96

RBLC-ID	Facility Name	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit (Trucks/day)
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Paved Haul Roads	0		Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	148
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Paved Haul Roads	0		Particulate matter, filterable ≤ 2.5 µ (FPM2.5)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	148
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Biomass Laydown Roads (Unpaved)	0		Particulate matter, total (TPM)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	109
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Biomass Laydown Roads (Unpaved)	0		Particulate matter, total ≤ 10 µ (TPM10)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	109
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Biomass Laydown Roads (Unpaved)	0		Particulate matter, total ≤ 2.5 µ (TPM2.5)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	109
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Biomass Laydown Roads (Unpaved)	0		Particulate matter, total (TPM)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	109
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Biomass Laydown Roads (Unpaved)	0		Particulate matter, total ≤ 10 µ (TPM10)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	109
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Biomass Laydown Roads (Unpaved)	0		Particulate matter, total ≤ 2.5 µ (TPM2.5)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	109
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Paved Haul Roads	0		Particulate matter, total (TPM)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	148
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Paved Haul Roads	0		Particulate matter, total ≤ 10 µ (TPM10)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	148
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Paved Haul Roads	0		Particulate matter, total (TPM)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	148
*KS-0034	ABENGOA BIOENERGY BIOMASS OF KANSAS (ABBK)	41786	Paved Haul Roads	0		Particulate matter, total ≤ 10 µ (TPM10)	Truck traffic fugitive control strategy and monitoring plan, including sweeping and speed limits	148

APPENDIX F UPDATED CAM PLAN

December 2020

AM/NS Calvert, LLC
Scarfing Operation Wet Electrostatic Precipitator
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 proposed scarfing operations as part of this project will be controlled by a wet electrostatic precipitators (WESP). The scarfing 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 scarfing operation.

2.0 Monitoring Approach

Monitoring of the WESP for compliance is accomplished by:

1. Monitoring of voltage.

2. Semi-annual inspections and applicable maintenance conducted according to work practices and procedures.

3. 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. Monitoring of voltage was selected as a performance indicator because the WESP operates by creating an electric discharge in the flue gas, ionizing the air, and adding a negative charge to the particulate matter. This particulate matter adheres to the electrodes within the WESP and is removed from the flue gas as the gas passes through. A minimum voltage is required to demonstrate that the WESP 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.

3. Monitoring of visual emissions was selected as a performance indicator because opacity is a good indicator of proper operation and maintenance of the WESP. When the WESP is operating optimally, there will be no visible emissions. In general, an increase in visible emissions indicates reduced performance of the WESP. 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 the voltage will be based on the level recommended by the manufacturer.

2. The indicator range for maintenance and inspection will be based on scheduling and work practices and procedures.

3. The indicator range for opacity will be based on 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.

AM/NS Calvert, LLC
Scarfing Operation Wet Electrostatic Precipitator
Compliance Assurance Monitoring Plan
APPENDIX F

Scarfing Operation WESP CAM Plan

CAM Monitoring Approach		Performance Indicator 1	Performance Indicator 2	Performance Indicator 3
1	**Indicator**	**Voltage**	**Inspection/Maintenance**	**Opacity**
A.	Measurement	The WESP voltage will be measured using the WESP controller.	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 a 3-hr block average below the minimum required voltage.	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	The voltage will be measured using the instrumentation provided with the WESP.	Inspections will be performed at the WESP.	Visual inspection logs will be maintained and audited to ensure VE readings are conducted.

AM/NS Calvert, LLC
Scarfing Operation Wet Electrostatic Precipitator
Compliance Assurance Monitoring Plan
APPENDIX F

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**	**Performance Indicator 3**
B	Verification of Operational Status	Records of the readings will be maintained by the environmental department.	NA	Records of the readings will be maintained by the environmental department.
C	QA/QC Practices & Criteria	Controller will develop and implement a periodic performance check system.	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	At least once every 15 minutes	Semi-annual inspections and preventative maintenance conducted as needed.	Daily
4	**Data Collection Procedures**	The voltage will be recorded with date and time.	Records are maintained to document inspections and any required maintenance.	The VE observer will be familiar with WESP operations and be familiar with Method 9.
5	**Averaging Period**	3-hr	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.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of excursion, and corrective action taken.	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of excursion, and corrective action taken.

AM/NS Calvert, LLC
Degassing Operation Flares
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 proposed degassing operations as part of this project will be controlled by flares. The degassing operations, pre-controlled, emit CO 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 CO.

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 degassing operations.

2.0 Monitoring Approach

Monitoring of the flare for compliance is accomplished by:

1. Monitoring of flame presence as per 40 CFR 60.18(f) during times when emissions may be vented to flares.

2. 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 flame presence was selected as a performance indicator because proper operation for the flares is dependent upon continuous ignition of the pilot flame. The flares will be equipped with a heat sensing device to verify the presence of a flame for periods when emissions may be vented to them.

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 heat sensing device will be based on manufacturer recommendation.

2. The indicator range for maintenance and inspection will be based on scheduling and work practices and procedures.

AM/NS Calvert, LLC
Degassing Operation Flares
Compliance Assurance Monitoring Plan
APPENDIX F

Degassing Operation Flares CAM Plan

CAM Monitoring Approach		**Performance Indicator 1**	**Performance Indicator 2**
1	**Indicator**	**Flame Presence**	**Inspection/Maintenance**
A.	Measurement	Monitoring of flame presence will be measured using a heat sensing device.	Annual inspections and applicable maintenance according to work practices and procedures.
2	**Indicator Range/Excursion**	An excursion is defined as monitoring which indicates no flame presence when emissions are routed to the flares.	Excursions are defined as both not conducting annual inspections properly and not performing maintenance according to work practices and procedures.
3	**Performance Criteria**		
A.	Data Representativeness	The flame presence will be measured using the instrumentation provided with the flares.	Inspections will be performed at the flares.
B	Verification of Operational Status	Records of the readings will be maintained by the environmental department.	NA
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	Annual inspections and preventative maintenance conducted as needed.

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CAM Monitoring Approach		Performance Indicator 1	Performance Indicator 2
4	**Data Collection Procedures**	The flame presence will be recorded with date and time.	Records are maintained to document inspections and any required maintenance.
5	**Averaging Period**	Continuous (at least once every 15 minutes) when emissions routed to the flares	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 excursion, and corrective action taken.	Number, duration, cause of any excursion and the corrective action taken.

APPENDIX G UPDATED AIR DISPERSION MODELING REPORT

December 2020

AM/NS Calvert, LLC
Calvert, Alabama

Prevention of Significant Deterioration (PSD) Permit Application

Air Dispersion Modeling Report

December 2020

Project No.: 0426226

The business of sustainability

ERM

Signature page

December 2020

Prevention of Significant Deterioration (PSD) Permit Application

Air Dispersion Modeling Report

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1. INTRODUCTION

AM/NS Calvert, L.L.C. (AM/NS) 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 February 24, 2015 (Permit Number 503-0095).

AM/NS is submitting this application to request authorization for the following changes:

1. Construction of two (2) melt shops to reduce reliance on third party raw material providers. Each melt shop will consist of:
   - One (1) Electric Arc Furnaces (EAF);
   - One (1) twin Ladle Metallurgy Furnace (LMF);
   - One (1) Degassing Operation controlled by flare; and
   - One (1) Continuous Caster with spray vent, ladle/tundish preheating activities, and associated support equipment.

   Each melt shop will be controlled by one (1) new baghouse for control of emissions. In addition to the melt shops, the project will include installation of auxiliary equipment including one (1) new contact cooling tower, scrap and raw material handling operations, material storage silos, and a scarfing operation for slabs.

   The construction of the melt shops is proposed to be conducted in phases. Phase 1 will include the installation of the first set of melt shop and auxiliary equipment and Phase 2 will include the installation of the second melt shop and auxiliary equipment. The emission sources and potential emissions from both phases are included in this permit application.

   The modeling report is organized as follows:
   - Section 1.1 - Facility Description;
   - Section 1.2 - Description of Proposed Changes;
   - Section 2 - 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 – Risk Receptor Grid;
   - Section 9 – Ambient Background Concentrations;
   - Section 10 – Air Dispersion Modeling Results, Class II modeling: Section 10.1-10.4;

- Section 11 – Additional Impact Analyses;
- Section 12 – Impact on PSD Class I Areas;
- Appendix A – Justification for Alternate $PM_{2.5}$ Ambient Background Monitor;
- Appendix B – ADEM-provided ambient monitoring data for SO_2 and $PM_{2.5}$
- Appendix C – Existing AM/NS Facility Source Emissions and Stack Parameters;
- Appendix D – S6 and S7 Testing Results

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 (e.g., coils, slits, sheets, blanks) 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.

The raw materials in the production of steel strip are steel slabs that are currently barged to the facility from Brazil or received from other locations or suppliers. Steel slabs are heated and rolled to form a flat strip in the Hot Strip Mill (HSM). From the HSM, the coils (flat strips) are prepared for sales or proceed to the pickling lines. After pickling, if needed, the strips may be cold-rolled to customer specifications and then sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

1.2 Description of Proposed Changes

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

1.2.1 New Melt Shops

With this application, AM/NS proposes to construct two melt shops which will allow AM/NS to produce the steel slabs which are currently imported. A process flow diagram for the proposed project is included in Appendix A of the PSD application package.

The new equipment part of the proposed project will consist of the new melt shops and auxiliary sources where steel scrap and other alternative iron units will be charged and melted in an EAF. Steel scrap and other alternative iron units will be placed into the EAF where they will be charged and then melted. The resulting molten steel will be poured out of the EAF via tapping operations into a ladle which will then transfer the molten steel to a continuous caster where slabs will be formed. The slabs will leave the melt shop and be processed in the HSM and if needed may be cold-rolled after the HSM to customer specifications and then either sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

AM/NS is proposing to install two new melt shop in two phases. The proposed melt shop project will consist of the following new emission sources:

- Two (2) Electric Arc Furnaces (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations) and associated baghouses;
- One (1) Contact Cooling Tower for Casting (Cooling Tower will be sized for casting from both EAFs);
- Two (2) Caster Steam Exhausts (Direct contact cooling water for Casting);
- Slag Handling Operations;
- Storage Piles (scrap and raw material handling operations) and Material Transfer;
- Two (2) Degassing Flares (1 Vacuum Tank Degassing (VTD) Flare and 1 Ruhrstahl-Heraeus (RH) Flare);
- 24 silos for the storage of alloys;
- Ten (10) silos for the storage of lime, dolomite and bauxite;
- Eight (8) silos for the storage of direct reduced iron (DRI);
- Five (5) silos for the storage of flux injection materials; and
- Four (4) silos for the storage of hot briquetted iron (HBI);
- Two (2) baghouse dust silos (BH); and
- Scarfing Operations and associated electrostatic precipitator (ESP).

1.2.2 Changes to Existing Stack Heights

As a result of the proposed project, changes to existing stack heights are included to satisfy air modeling requirements. The following stacks will be raised with the proposed project:

- Finishing Mill with Wet ESP (S5) will be raised from 30 meters to 65 meters;
- Roughing Mill with Wet ESP (S5a) will be raised from 30 meters to 65 meters;
- Continuous Pickling #1 – Processor/Stretcher/Leveler with Baghouse (S6) will be raised from 32 meters to 60 meters; and
- Continuous Pickling #2 – Processor/Stretcher/Leveler with Baghouse (S7) will be raised from 32 meters to 60 meters;

2. EMISSION CALCULATIONS

A summary of the Potential To Emit (PTE) from the proposed project involving construction of the two melt shops is provided in Table 2-1. The specific emission calculation details will be included in Appendix B of the PSD application package.

Table 2-1 Summary of Melt Shop Installation

Project Potential to Emit

Pollutant	Annual Emissions Rate (tpy)
PM	523.52
PM_{10}	472.87
$PM_{2.5}$	454.28
CO	4,402.32
SO_2	675.24
NO_x	695.27
VOC	260.16
Pb	3.86
Total HAP	6.26

3. PSD APPLICABILITY ANALYSIS

AM/NS 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) does 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. AM/NS 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 – New Melt Shops

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	Baseline Actual Emissions (tpy)	Project Potential Emissions (tpy)	Net Emissions Increase[1] (tpy)	PSD SER (tpy)	PSD Review Triggered?
PM	0	523.52	523.52	25	YES
PM_{10}	0	472.87	472.87	15	YES
$PM_{2.5}$	0	454.28	454.28	10	YES
CO	0	4,402.32	4,402.32	100	YES
SO_2	0	675.24	675.24	40	YES
NO_x	0	695.27	695.27	40	YES
VOC	0	260.16	260.16	40	YES
Lead	0	3.86	3.86	0.6	YES

As shown in Table 3-1, the net emissions increase of each of these PSD pollutants is greater than the respective PSD SERs and therefore, these pollutants are subject to PSD review. Detailed emission calculations for each of the proposed operations are provided in Appendix B of the PSD application

[1] The project emission increases are conservatively assumed to be equal to the net emissions increase.

package. For projects that trigger PSD permitting requirements, the following items are required to be addressed in the permit application:

- Determination of best achievable control technology (BACT) for each pollutant which triggers PSD review;
- National Ambient Air Quality Standards (NAAQS) and PSD Increment Air Quality analysis;
- Additional Air Impact Analysis; and
- Class I Area Impact.

The detailed BACT analysis is included in Appendix D of the PSD application package. This report presents the methodology and the results of the ambient air quality impact assessments completed to satisfy the other three requirements presented in the bulleted list above. A modeling protocol was submitted to ADEM on December 17, 2019, for 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. Preliminary project-only significant impact level (SIL) modeling was performed for each of the required standards with subsequent cumulative modeling performed for pollutants and averaging periods for which the respective SIL was exceeded. The SIL modeling was also used to assess if any pre-constructive modeling would be necessary by comparing against the predicted screening impacts 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)
Carbon Monoxide (CO)	1-hour	2,000	N/A	40,000[b]	N/A
	8-hour	500	575	10,000[b]	N/A
Nitrogen Dioxide (NO_2)	1-hour	7.5[c]	N/A	188.7[d]	Not Established
	Annual	1	14	100[a]	25[a]
Lead (Pb)	Month	N/A	0.1	0.15[e]	N/A
Particulate Matter less than 10 microns (PM_{10})	24-hour	5	10	150[f]	30[b]
	Annual	1	N/A	*Revoked*	17[a]
Particulate Matter less than 2.5 microns ($PM_{2.5}$)	24-hour	1.2	4[g]	35[h]	9[b]
	Annual	0.2[i]	N/A	12[j]	4[a]
Sulfur Dioxide (SO_2)	1-hour	7.8	N/A	196[k]	Not Established
	3-hour	25	N/A	1300[a]	512[b]
	24-hour	5	13	*Revoked*	91[b]
	Annual	1	N/A	*Revoked*	20[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] Based on the 1-hour NO_2 NAAQS of 100 ppb. 98th percentile (high-8th-high) of the maximum daily 1-hour concentration per year, averaged over five years.

[e] The maximum 3-month rolling average over the five years of modeling period.

[f] High sixth high over five years of concatenated meteorological data.

[g] $PM_{2.5}$ SMC was vacated and remanded on January 22, 2013 by the United States District Court, D.C. Circuit.

[h] Based on the 24-hour $PM_{2.5}$ NAAQS for the 98th percentile (high-8th-high) of the 24-hour concentration averaged over five years.

[i] In a October 5, 2018 meeting at ADEM, ERM requested that the Project is use the annual $PM_{2.5}$ SIL of 0.3 μg/m³. The 2016 $PM_{2.5}$ and Ozone SIL Draft Guidance provides that a state is authorized to use the annual $PM_{2.5}$ SIL of 0.3 μg/m³ from 40 C.F.R. § 51.165(b) rather than the non-binding guidance-based SIL of 0.2 μg/m³.

[j] The maximum 5-year average 1st-high predicted concentration modeled.

[k] Based on the 1-hour SO_2 NAAQS of 75 ppb. 99th percentile (high-4th-high) of the maximum daily 1-hour concentration per year, averaged over five years.

5. AIR QUALITY DISPERSION MODEL

The air quality modeling analyses employed the AMS/EPA Regulatory Model (AERMOD), version 19191. 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.

Inspection of the land use 3 kilometers around the facility (Figure 5-1) has determined the site to be situated within a rural in setting, thus the RURAL air dispersion option was used in AERMOD.

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.

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 AM/NS mill. Figure 5-2 illustrates the mill emission sources in relation to building structures considered in the downwash analysis.

Good Engineering Practice (GEP) stack height analysis has been conducted to demonstrate that stack heights comply with USEPA's GEP stack height regulations and will therefore be modeled at their actual height.

Figure 5-1 3 Kilometer Aerial around AM/NS Project

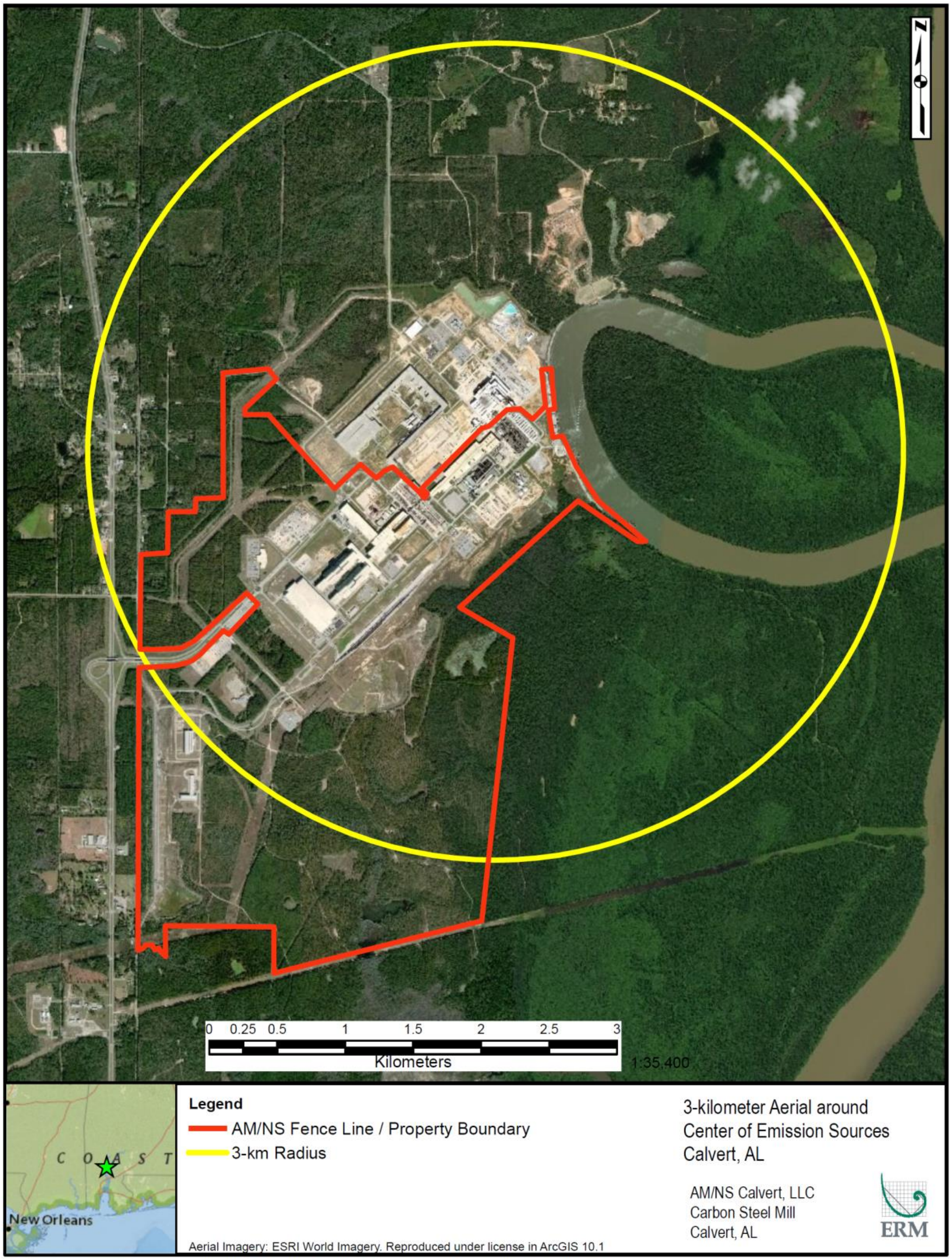
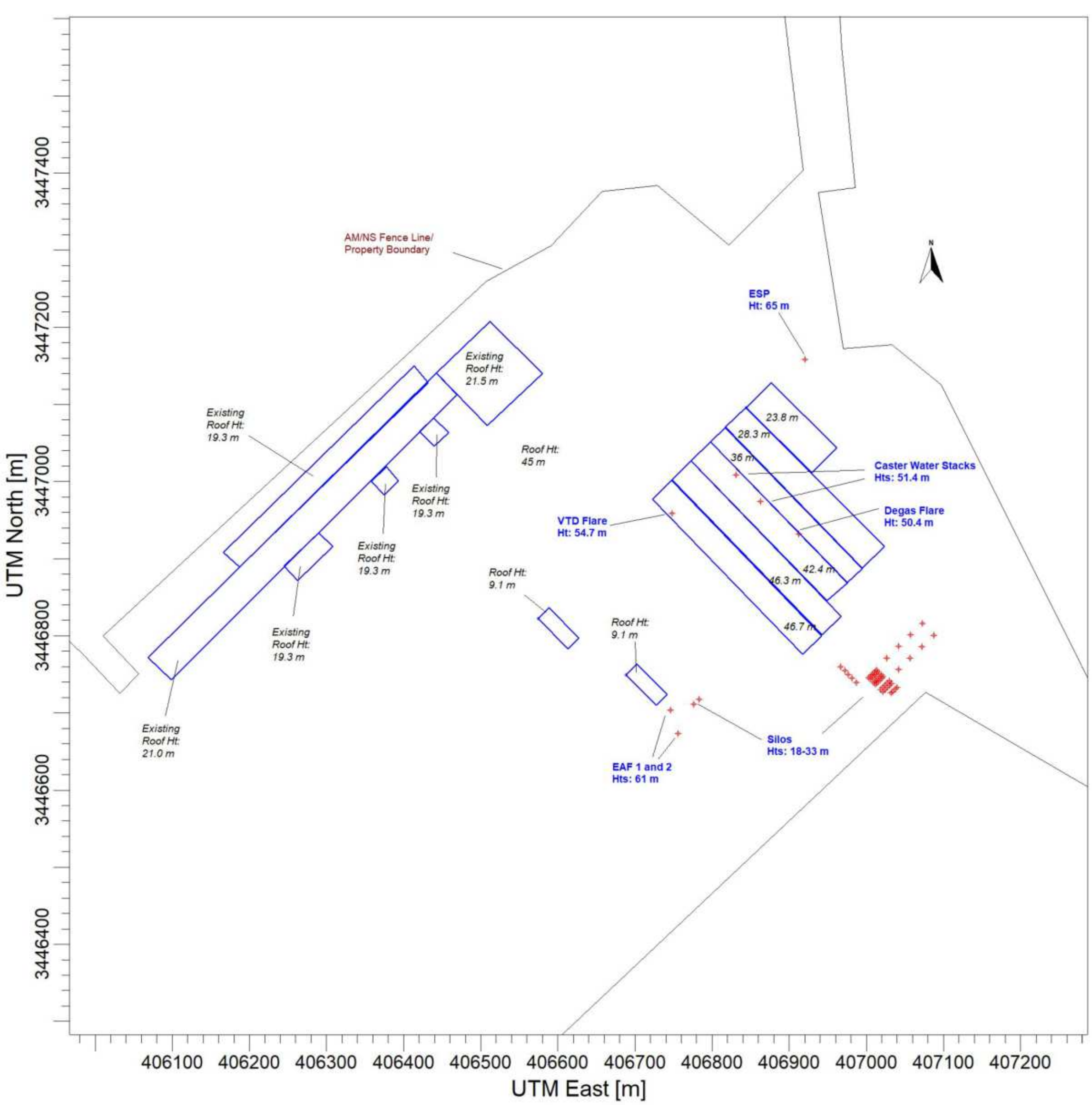


Figure 5-2 Project Sources and Surrounding Buildings

PROJECT TITLE:

AM/NS Calvert Meltshop Expansion
Project Emissions Sources and Surrounding Buildings



COMMENTS: Existing structures are noted in the diagram.	SOURCES: **60**	COMPANY NAME:	
	RECEPTORS: **20006**	MODELER: **Olga Samani**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:8,300 0 — 0.3 km	
	MAX: **8.48 ug/m^3**	DATE: **12/21/2020**	PROJECT NO.: **0426226**

6. EMISSION INVENTORY DATA

AM/NS Calvert, LLC

Proposed project emission sources at AM/NS consist of stack exhausts. Table 6-1 includes the proposed project's emissions and stack parameters.

Other Major Emission Sources

In addition to emissions from the proposed mills, other existing AM/NS facility sources as well as nearby inventory sources 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 has provided the nearby emission inventories for pollutants that have triggered PSD and NAAQS cumulative modeling.

Emission Sources for Modeling Compliance with the 1-Hour Average NO_2 and SO_2 NAAQS

USEPA's March 1, 2011 memorandum "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard", addresses emission sources that operate intermittently. The memo stated "…EPA believes the most appropriate data to use for compliance demonstrations for the 1-hour average NO_2 and SO_2 NAAQS are those based on emissions scenarios that are continuous enough or frequent enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations." AM/NS has excluded any emission unit from modeling if the emission unit operates intermittently. Note the form of the 1-hour NO_2 and SO_2 NAAQS are the 98^{th} percentile (8^{th} high) and 99^{th} (4^{th} high) daily maxima, respectively. As such, AM/NS excluded non-Project sources which have been shown to operate less than 8 days per year (192 hours per year) and they are listed in Table 6-2 (these are AM/NS existing emergency engines and emergency firewater pumps). No intermittent sources were excluded from the ADEM-provided offsite emissions inventory.

NO_X-to-NO_2 Conversion

The USEPA allows for a tiered approach for evaluating the conversion of NO_X to NO_2 in the air dispersion modeling. Tier 1 considers 100% conversion of NO_X to NO_2 and is the most conservative approach. Tier 2 involves a polynomial curve fit to observational data for scaling the NO_X predicted impacts into NO_2. Tier 3 screening approaches include two options: the Ozone-Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM). Both are included as default options in the AERMOD dispersion model version 19191, with the OLM approach generally seen as more conservative than PVMRM. The NO_2 NAAQS compliance demonstrations utilized the OLM option recommended by USEPA to obtain predicted concentrations of NO_2 from point sources. The OLM option was selected for the NO_2 air dispersion modeling because in version 19191 of AERMOD, OLM, unlike PVMRM, can process both consuming and expanding emissions (i.e. positive and negative) associated with modeling for the PSD Increment. The use of OLM options in AERMOD requires the specification of an in-stack ratio (ISR) of NO_2/NOx for each source. AM/NS used the recently issued alpha ISR database as available on the US EPA's Technology Transfer Network (TTN) to evaluate the ISR for similar source types for both on-site and off-site sources when more specific data was not available. Outokumpu's 2017 Air Dispersion Modeling Assessment, used results from stack testing performed on a number of their on-site sources to calculate NO_2/NOx ratios. In accordance with this testing, an ISR of 0.15 was calculated for the EAF. AM/NS utilized these ISR's for similar sources. For sources without more appropriate source-specific information, AM/NS used the default ISR of 0.5 as dictated in the "Additional Clarification Regarding Application of Appendix W

Modeling Guidance for the 1-hour NO_2, National Ambient Air Quality Standard" (March 2011). AM/NS communicated this methodology with ADEM, and these ratios were approved in an email dated November 1, 2018 from ADEM.

When using the OLM option in AERMOD for estimating the NO_2 concentrations, hourly ambient ozone concentrations during the 2014-2018 period modeled in the PSD analysis was used to represent hourly background ozone levels from the Chickasaw monitor site (AQS # 01-097-0003). The Chickasaw monitor is a seasonal ozone monitor which means that observations are collected only between March through October each year. For each month of the provided ozone hourly data, a maximum hourly value is calculated and stored for use in replacing any missing hours. For the non-seasonal ozone months, the maximum hourly values from March are used as a conservative substitute for January and February while the maximum hourly values from October are conservatively used for November and December. The hourly ozone data was used within the OLM option in AERMOD to simulate the atmospheric chemistry of ozone reacting with nitric oxide (NO) emitted from the stack to form NO_2. The model disperses the initial NOx emissions (which are mostly NO) each hour of the day over each year of meteorological data (e.g., 8,760 hours in a 365-day year). Finally, a refined option offered in using OLM is the grouping of proximal plumes for assessing the scavenging potential of the available ozone. This option was used to group any closely spaced sources within 3-km of AM/NS.

Table 6-1 Table of Emissions and Stack Parameters for AM/NS Proposed Project Sources

Source	PM_{10}	$PM_{2.5}$	CO	SO_2	NO_x	Pb	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
	g/s	g/s	g/s	g/s	g/s	g/s						
EAF 1 (short term)	7.82E+00	7.82E+00	9.17E+01	1.46E+01	1.46E+01	8.33E-02	406,745.97	3,446,703.76	61.00	391.48	23.03	6.50
EAF 1 (annual)	5.21E+00	5.21E+00	6.10E+01	9.71E+00	9.71E+00	5.55E-02						
EAF 2 (short term)	7.82E+00	7.82E+00	9.17E+01	1.46E+01	1.46E+01	8.33E-02	406,755.44	3,446,673.61	61.00	391.48	23.03	6.50
EAF 2 (annual)	5.21E+00	5.21E+00	6.10E+01	9.71E+00	9.71E+00	5.55E-02						
Degas Flare 1 (short term)	4.17E-02	4.17E-02	3.27E+00	1.15E-03	1.92E-01	9.61E-07	406,912.659	3,446,931.971	50.37	1,273.00	20.00	0.40
Degas Flare 1 (annual)	4.79E-02	4.79E-02	3.63E+00	1.41E-03	2.35E-01	1.18E-06						
Degas Flare 2 (short term)	3.20E-02	3.20E-02	3.16E+00	3.86E-04	6.43E-02	3.21E-07	406,748.059	3,446,958.779	54.69	1,273.00	20.00	0.30
Degas Flare 2 (annual)	7.44E-03	7.44E-03	7.24E-01	9.77E-05	1.63E-02	8.14E-08						
Contact Water Stack 1	4.33E-01	4.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	406,862.74	3,446,973.87	51.37	333.15	42.28	1.42
Contact Water Stack 2	4.33E-01	4.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	406,830.96	3,447,008.91	51.37	333.15	42.28	1.42
Scarfing ESP (short term)	1.94E+00	1.94E+00	3.67E-02	2.62E-04	4.37E-02	2.18E-07	406,920.41	3,447,158.30	65.00	333.15	20.00	2.20
Scarfing ESP (annual)	1.44E+00	1.44E+00	2.73E-02	1.95E-04	3.24E-02	1.62E-07						
Alloys Silo 1	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,021.72	3,446,746.95	18.14	Ambient	0.11	1.03
Alloys Silo 2	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,019.75	3,446,745.04	18.14	Ambient	0.11	1.03

Source	PM_{10}	$PM_{2.5}$	CO	SO_2	NO_x	Pb	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
	g/s	g/s	g/s	g/s	g/s	g/s						
Alloys Silo 3	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,017.67	3,446,743.03	18.14	Ambient	0.11	1.03
Alloys Silo 4	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,015.70	3,446,741.11	18.14	Ambient	0.11	1.03
Alloys Silo 5	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,013.63	3,446,739.10	18.14	Ambient	0.11	1.03
Alloys Silo 6	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,011.66	3,446,737.19	18.14	Ambient	0.11	1.03
Alloys Silo 7	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,019.63	3,446,749.05	18.14	Ambient	0.11	1.03
Alloys Silo 8	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,017.63	3,446,747.23	18.14	Ambient	0.11	1.03
Alloys Silo 9	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,015.55	3,446,745.21	18.14	Ambient	0.11	1.03
Alloys Silo 10	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,013.58	3,446,743.30	18.14	Ambient	0.11	1.03
Alloys Silo 11	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,011.50	3,446,741.29	18.14	Ambient	0.11	1.03
Alloys Silo 12	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,009.54	3,446,739.38	18.14	Ambient	0.11	1.03
Alloys Silo 13	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,015.35	3,446,753.51	18.14	Ambient	0.11	1.03
Alloys Silo 14	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,013.38	3,446,751.60	18.14	Ambient	0.11	1.03
Alloys Silo 15	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,011.30	3,446,749.59	18.14	Ambient	0.11	1.03
Alloys Silo 16	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,009.34	3,446,747.68	18.14	Ambient	0.11	1.03
Alloys Silo 17	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,007.26	3,446,745.66	18.14	Ambient	0.11	1.03
Alloys Silo 18	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,005.29	3,446,743.75	18.14	Ambient	0.11	1.03

Source	PM_{10}	$PM_{2.5}$	CO	SO_2	NO_x	Pb	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
	g/s	g/s	g/s	g/s	g/s	g/s						
Alloys Silo 19	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,013.23	3,446,755.70	18.14	Ambient	0.11	1.03
Alloys Silo 20	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,011.26	3,446,753.79	18.14	Ambient	0.11	1.03
Alloys Silo 21	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,009.18	3,446,751.77	18.14	Ambient	0.11	1.03
Alloys Silo 22	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,007.21	3,446,749.86	18.14	Ambient	0.11	1.03
Alloys Silo 23	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,005.14	3,446,747.85	18.14	Ambient	0.11	1.03
Alloys Silo 24	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,003.17	3,446,745.94	18.14	Ambient	0.11	1.03
DRI Silo 1	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,087.43	3,446,800.69	27.43	Ambient	0.45	1.03
DRI Silo 2	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,072.13	3,446,785.83	27.43	Ambient	0.45	1.03
DRI Silo 3	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,056.82	3,446,770.97	27.43	Ambient	0.45	1.03
DRI Silo 4	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,041.52	3,446,756.12	27.43	Ambient	0.45	1.03
DRI Silo 5	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,072.58	3,446,815.99	27.43	Ambient	0.45	1.03
DRI Silo 6	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,057.27	3,446,801.14	27.43	Ambient	0.45	1.03
DRI Silo 7	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,041.97	3,446,786.28	27.43	Ambient	0.45	1.03
DRI Silo 8	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,026.66	3,446,771.42	27.43	Ambient	0.45	1.03
LDB Silo 1	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,032.61	3,446,738.41	32.80	Ambient	0.11	1.03
LDB Silo 2	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,029.77	3,446,735.66	32.80	Ambient	0.11	1.03
LDB Silo 3	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,026.92	3,446,732.90	32.80	Ambient	0.11	1.03
LDB Silo 4	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,024.08	3,446,730.14	32.80	Ambient	0.11	1.03
LDB Silo 5	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,021.24	3,446,727.38	32.80	Ambient	0.11	1.03
LDB Silo 6	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,029.85	3,446,741.26	32.80	Ambient	0.11	1.03

Source	PM_{10}	$PM_{2.5}$	CO	SO_2	NO_x	Pb	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)
	g/s	g/s	g/s	g/s	g/s	g/s						
LDB Silo 7	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,027.01	3,446,738.50	32.80	Ambient	0.11	1.03
LDB Silo 8	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,024.17	3,446,735.74	32.80	Ambient	0.11	1.03
LDB Silo 9	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,021.32	3,446,732.98	32.80	Ambient	0.11	1.03
LDB Silo 10	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,018.48	3,446,730.22	32.80	Ambient	0.11	1.03
Flux Silo 1	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	406,986.71	3,446,739.69	17.25	Ambient	0.11	1.03
Flux Silo 2	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	406,981.68	3,446,744.88	17.25	Ambient	0.11	1.03
Flux Silo 3	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	406,976.75	3,446,749.95	17.25	Ambient	0.11	1.03
Flux Silo 4	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	406,972.16	3,446,754.69	17.25	Ambient	0.11	1.03
Flux Silo 5	1.080E-03	1.080E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	406,966.91	3,446,760.09	17.25	Ambient	0.11	1.03
HBI Silo 1	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,039.55	3,446,733.01	15.54	Ambient	0.45	1.03
HBI Silo 2	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,037.80	3,446,731.31	15.54	Ambient	0.45	1.03
HBI Silo 3	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,033.87	3,446,727.49	15.54	Ambient	0.45	1.03
HBI Silo 4	4.320E-03	4.320E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	407,032.12	3,446,725.80	15.54	Ambient	0.45	1.03
BH Silo 1	4.83E-03	4.83E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	406,776.09	3,446,711.23	18.29	Ambient	0.51	1.03
BH Silo 2	4.83E-03	4.83E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	406,783.12	3,446,717.85	18.29	Ambient	0.51	1.03

Table 6-2 Sources Excluded from 1-hour SO2 and 1-hour NO2 NAAQS Modeling

Source ID	Source Description
S42	CWC Generator
S43	Generator - Electrical Room 2-1
S44	Generator - Electrical Room 2-2
S45	Generator - Electrical Room 2-3
S46	Generator - Electrical Room 4
S47	Primary Diesel Pump 1
S48	Primary Diesel Pump 2
S49	Primary Diesel Pump 3
S50	Secondary Diesel Pump 1
S51	Secondary Diesel Pump 2
S52	Secondary Diesel Pump 3
S53	Diesel Generator - Line 3
S54	Diesel Generator - Line 4
S55	Building 901 Emergency Generator
S56	Permanent Data Center Generator
S57	Temporary Data Center Generator
S58A	Dispatch Center Generator - Stack 1
S58B	Dispatch Center Generator - Stack 2
SXX-1	Fueling Station Generator
SXX-2	Cold Roll Mill Generator
SXX-3	HSM Furnace Generator
Pump House EGEN 1	Pump House EGEN 1
Pump House EGEN 2	Pump House EGEN 2
S4 EGEN Pump	S4 EGEN Pump
Electrical Substation EGEN	Electrical Substation EGEN
NG Generac Controls FWP	NG Generac Controls FWP

7. METEOROLOGICAL DATA

The meteorological database for the AM/NS dispersion modeling analysis consists of 5 years (2014-2018) of surface observations from the Mobile Regional Airport National Weather Service (NWS) station and upper air data from the Slidell, Louisiana NWS station. The pre-processed, hourly NWS data have been obtained from the ADEM Air Division. Figure 7-1 presents the cumulative annual frequency wind rose. Low wind events, events with winds less than 4 knots (4.6 mph), represented almost 30 percent of the hours for this 5 year period, hence the low wind optimization option (ADJ_U*) was used in processing the final stage in AERMET (version 19191).

ADEM requires that two meteorological databases be evaluated in the dispersion modeling analyses. One database used the surface characteristics from the NWS station airport anemometer tower and the other database used the surface characteristics centered over the AM/NS site generated using the land cover processor AERSURFACE (version 20060). AERSURFACE uses a 1-km radius surrounding the Terminal Site to determine surface roughness values for each direction sector, and a 10 km by 10 km area to determine the midday albedo and daytime Bowen Ratio (the ratio of sensible heat to latent heat). Figures 7-2 and 7-3 present the land use surrounding the Mobile Regional Airport and AM/NS, respectively.

The AM/NS site meteorological processing has followed the ADEM procedure for the Mobile Regional Airport surface characteristics by evaluating the AERSURFACE outputs using a 12-sector, monthly approach. The AERSURFACE input parameters were determined from the information as provided in Attachment 1 to Appendix C of ADEM’s May 2008 “PSD Air Quality AERMOD Modeling Guidelines.”

As per Appendix C of ADEM’s May 2008 “PSD Air Quality AERMOD Modeling Guidelines”, AM/NS has obtained the AERMET input files for project meteorological data from ADEM for 2014-2018. AM/NS then used the surface characteristics for the mill for the three Bowen Ratio Categories (wet, average, and dry) to develop a second set of meteorological data based on the stage-3 AERMET inputs in the ADEM-processed meteorological data (average in 2014, 2016 and 2018; wet in 2015 and 2017).

AM/NS executed duplicate AERMOD runs based on the meteorological data provided by ADEM that uses the surface characteristics of the airport and the meteorological data developed using the mill surface characteristics. Both sets of meteorological data were used since neither consistently produced more conservative predicted impacts across all the averaging periods and pollutants.

Figure 7-1 5-year (2014 – 2018) Wind Rose for Mobile Airport, AL

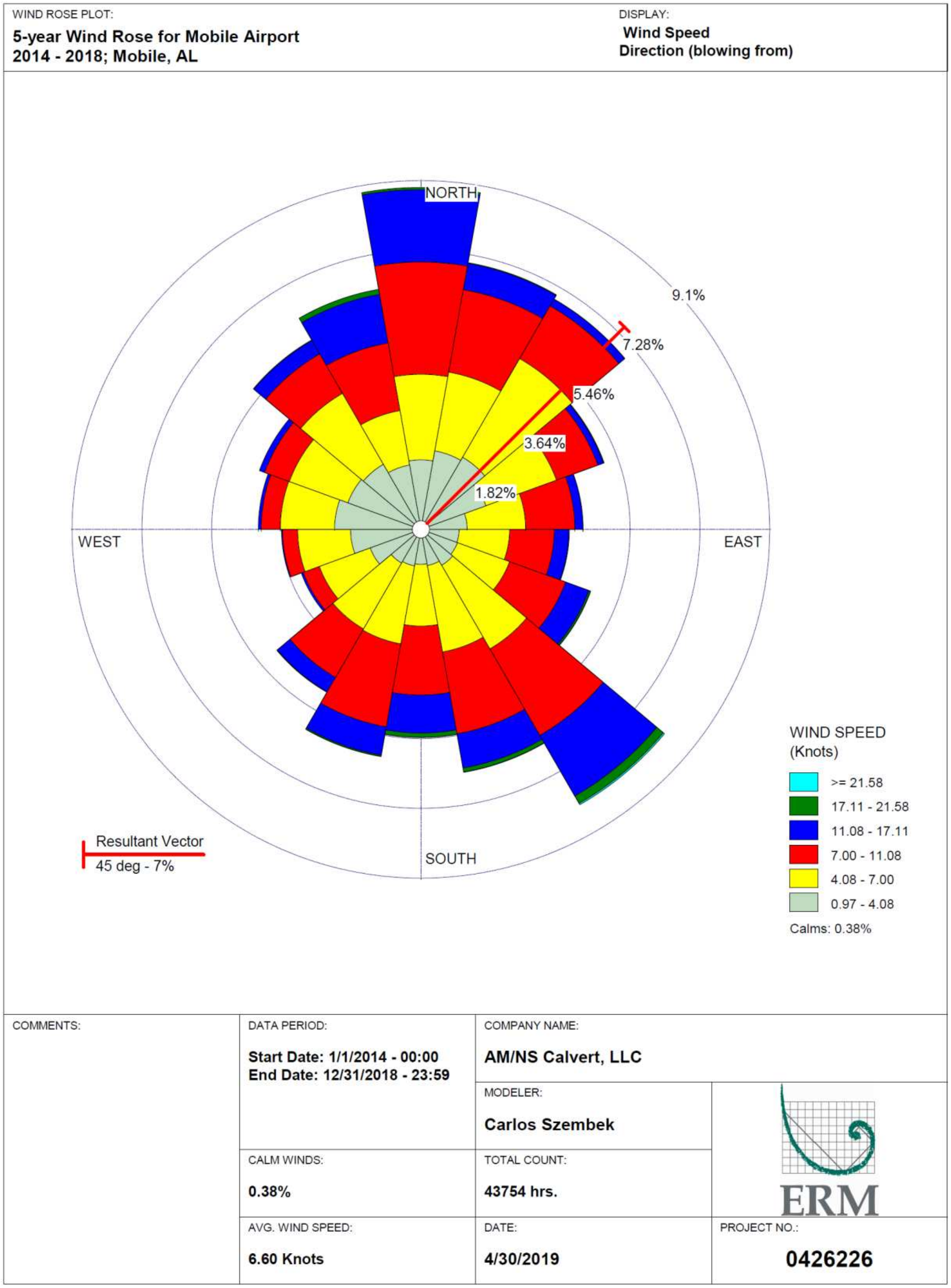


Figure 7-2 Land Use 1 kilometer around the Mobile Airport Anemometer

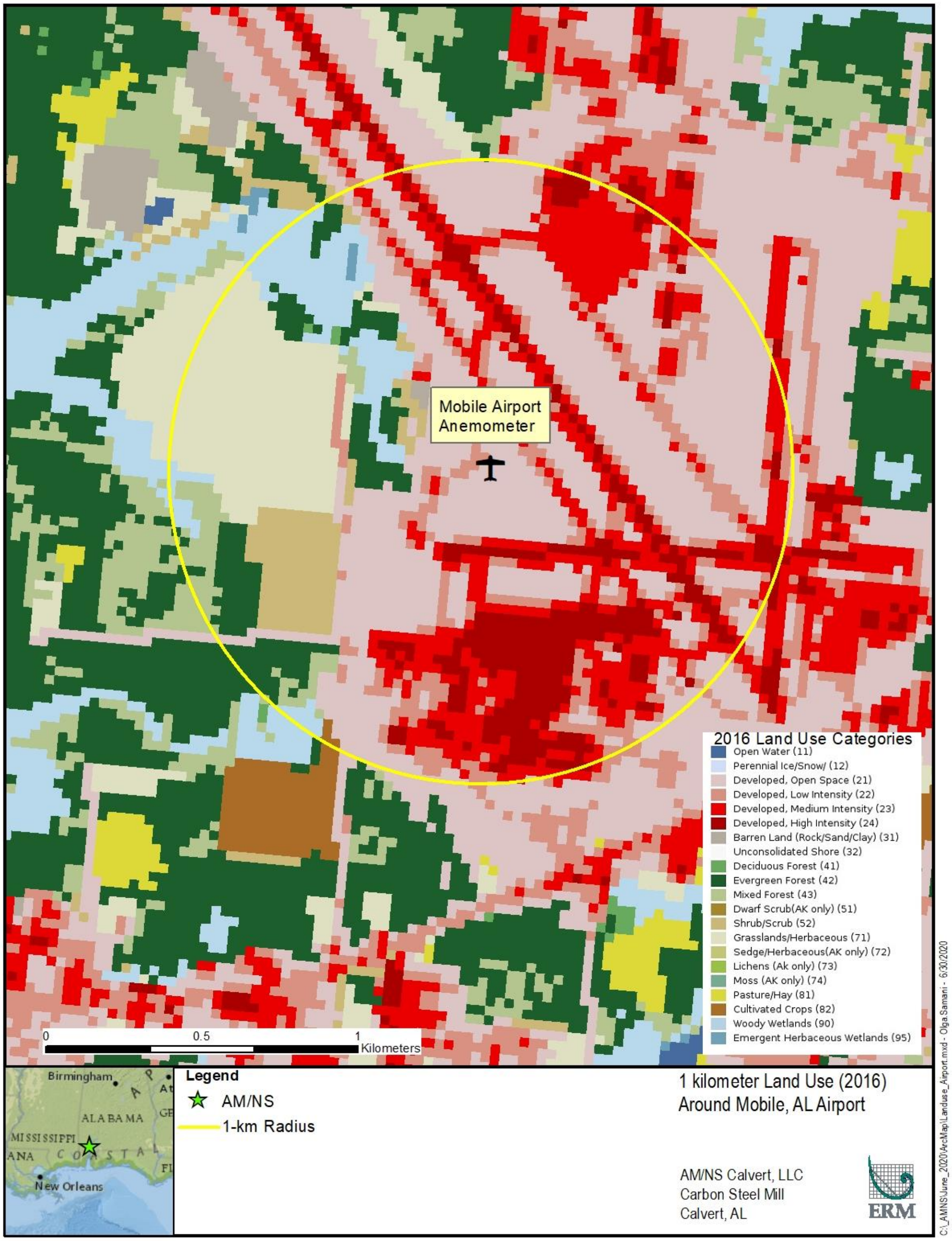
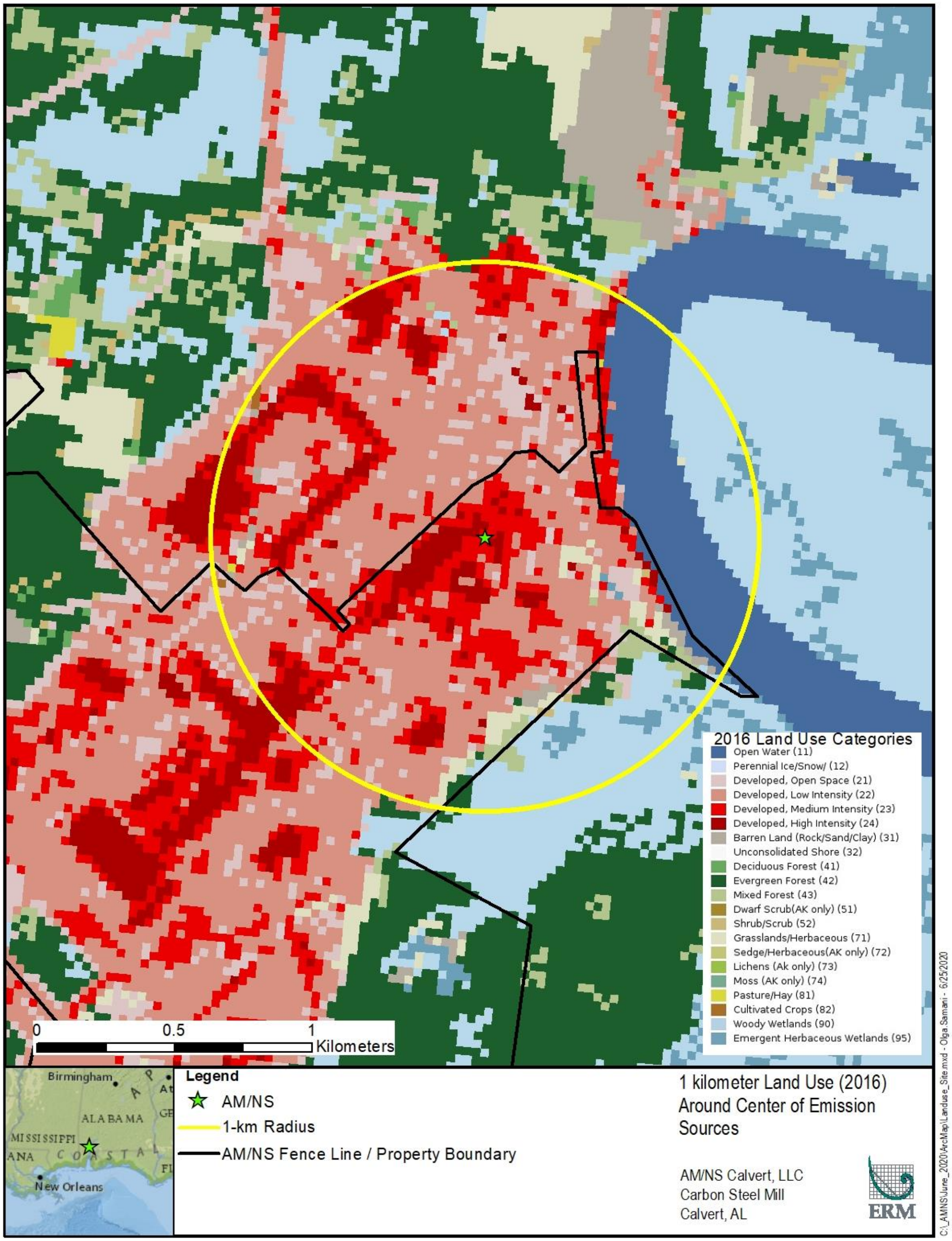


Figure 7-3 Land Use around the Center of AM/NS Project Emission Sources



8. RISK RECEPTOR GRID AND AM/NS FENCELINE

The initial significant impact analyses was performed using two receptor grids, one extending out to 10 km (consisting of 12,090 receptors) and a second receptor grid for 1-hour NO_2 and SO_2 extending out to 20 km (consisting of 13,330 receptors). The 20 km grid was required since the predicted concentration gradients for the significant impact level modeling for 1-hour NO_2 and SO_2 were increasing beyond 10 km. The receptor grid was generated using the following:

1. 50-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. Terrain heights for each receptor point were derived from the latest National Elevation Data (NED) obtained from the U.S. Geological Survey. Base elevations for mill buildings and emission sources were based on information provided by AM/NS. For any cumulative modeling cases in which high gradients of concentrations were predicted within a nearby inventory facility's fence line, AM/NS split the receptor grid to exclude the emission impacts for the culpable inventory facility from within their own fence line. This split-grid approach was utilized on the NAAQS and PSD Increment modeling for all the PM_{10} and $PM_{2.5}$ runs. Finally, as per ADEM guidance, for the cumulative modeling runs, all maximum impacts were resolved within the 100 meter receptor spacing (see Section 10.3.2).

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[2] and ADEM's review of the modeling protocol, Figure 8-3 presents the location of the AM/NS boundary.

[2] U.S. Environmental Protection Agency, *Draft Guidance: Revised Policy on Exclusions from "Ambient Air"* November, 2018

Figure 8-1 Far-field AERMOD Receptor Grid

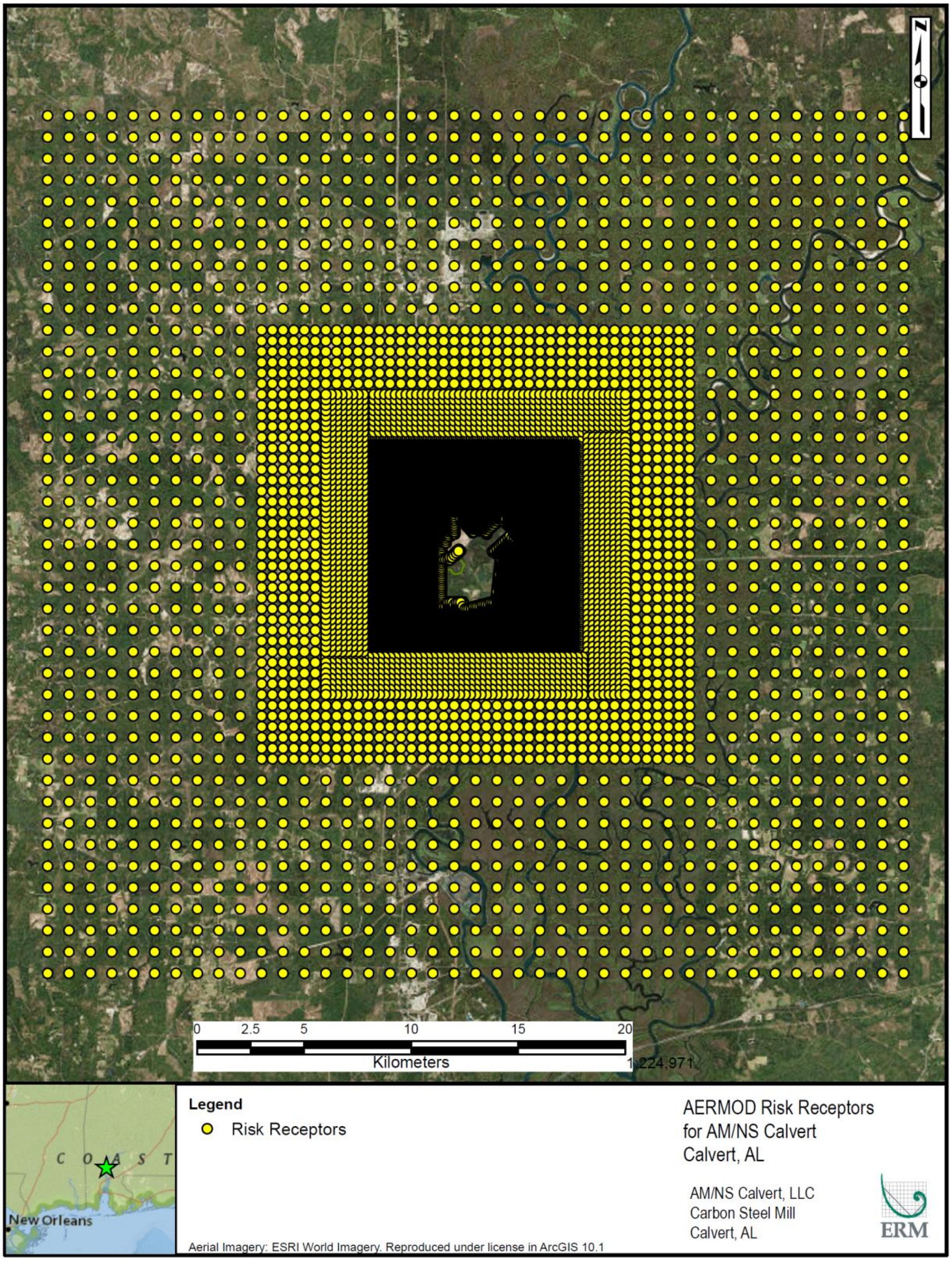


Figure 8-2 Near-field AERMOD Receptor Grid

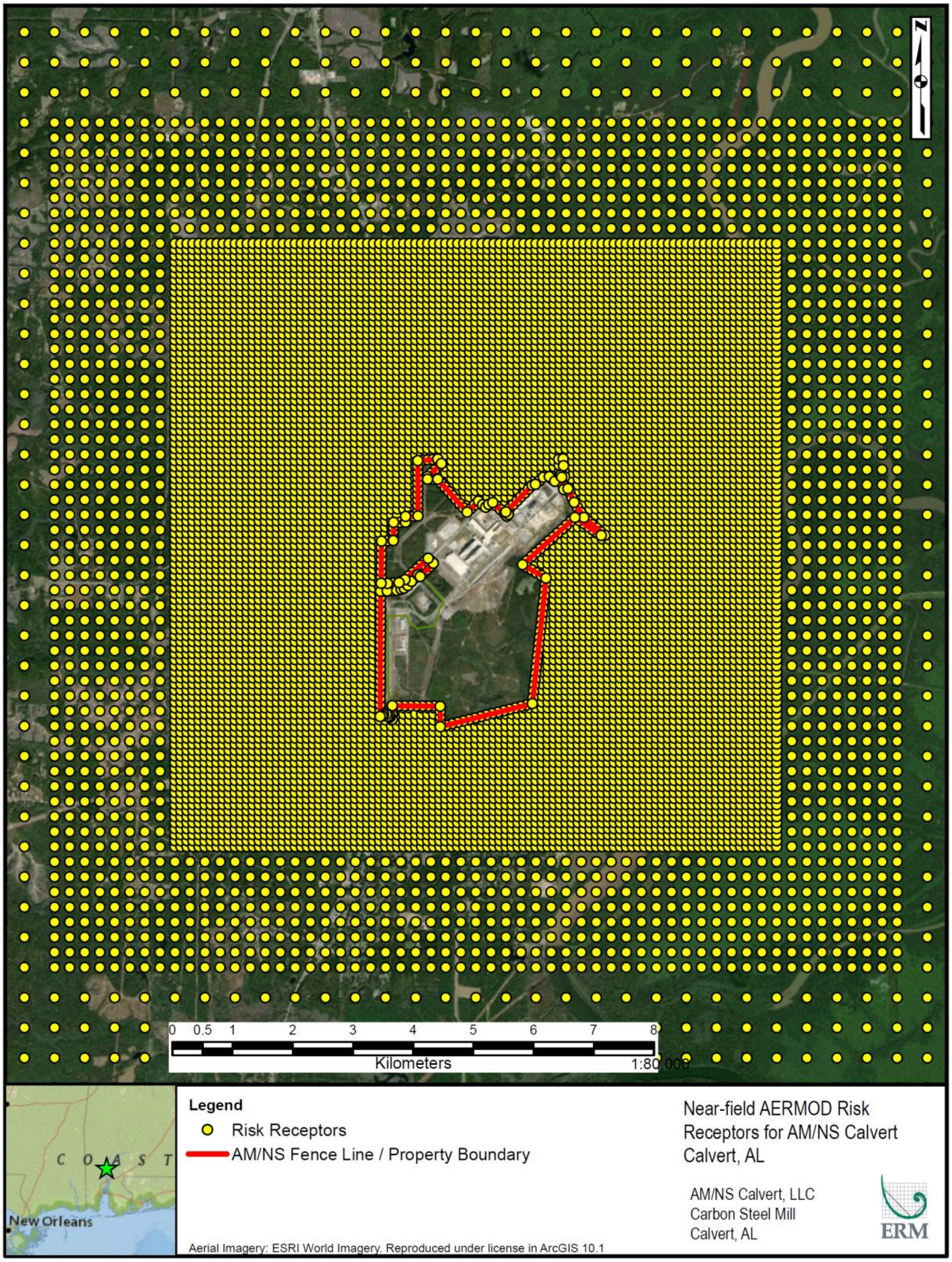
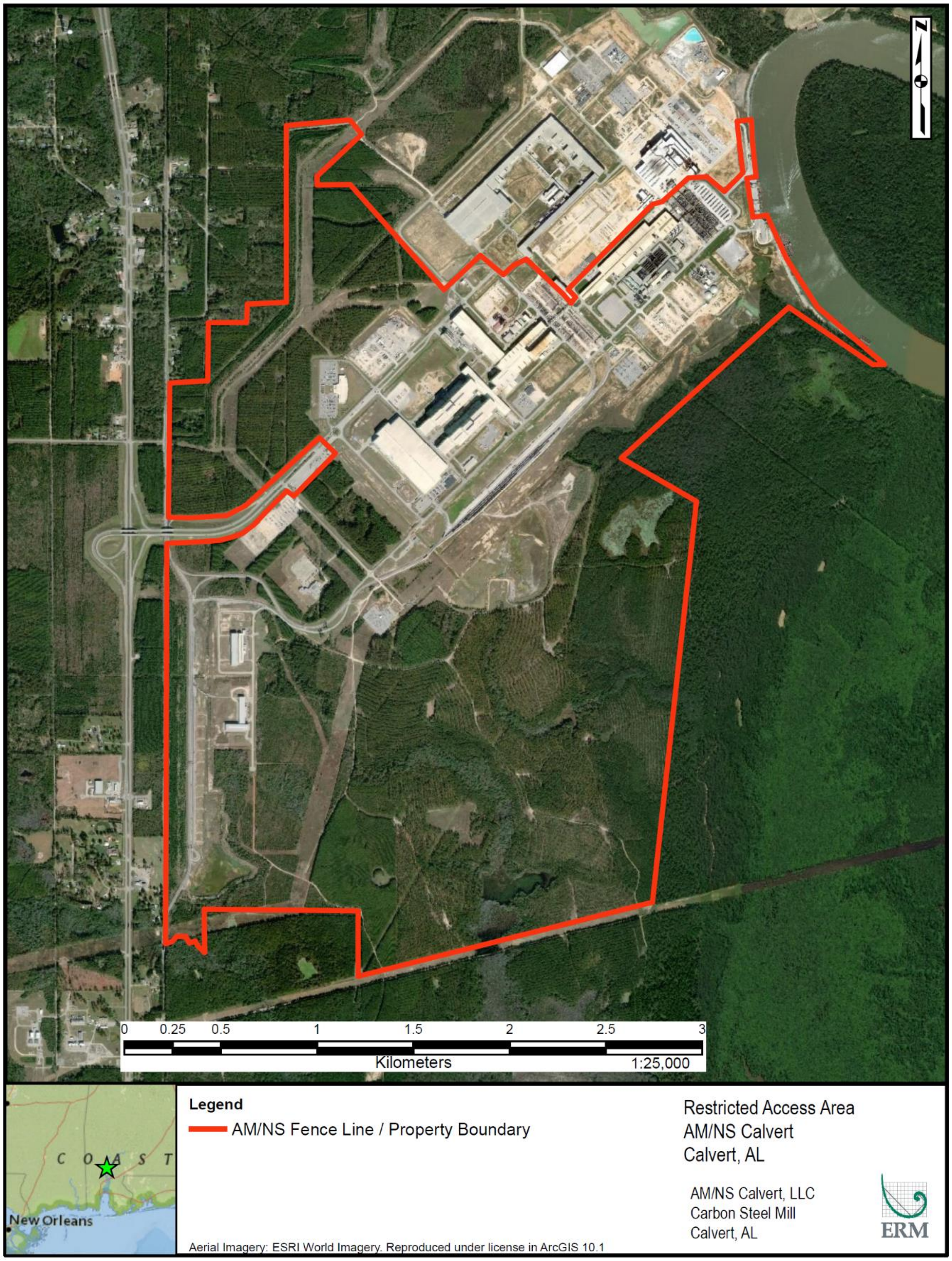


Figure 8-3 AM/NS Restricted Access Area



9. AMBIENT BACKGROUND CONCENTRATIONS

For the NAAQS modeling, representative background concentrations were added to the maximum predicted concentrations for comparison with the national ambient air quality standards. The proposed background concentrations have been provided by ADEM and are listed in Table 9-1. Appendix A contains a memo provided to and accepted by ADEM for justification of an alternate, more representative $PM_{2.5}$ ambient background monitor[3]. Appendix B shows the design values provided by ADEM for $PM_{2.5}$ and SO_2.

Table 9-1 Monitored Design Values

Pollutant	Monitoring Station	Averaging Period	Monitored Design Value (μg/m³)	Years
NO_2	Yorkville, GA	1-hour	31.0	2014-2016
		Annual	7.5	
SO_2	Chickasaw, AL	1-hour	29.0	2016-2018
		3-hour	10.0	
PM_{10}	Montgomery, AL	24-hour	25.0	2016-2018
$PM_{2.5}$	Fairhope, AL	24-hour	17.0	2016-2018
		Annual	7.3	

3 Correspondence between ERM and ADEM, January 14, 2020.

10. AIR DISPERSION MODELING RESULTS

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 2014-2018 for the Mobile Regional Airport as described in Section 7.

10.1 SIL Modeling Results

This section describes the preliminary impact analyses conducted. The highest first high (H1H) impacts due to emission sources associated with only the proposed project were estimated through modeling and compared with the SILs for all applicable pollutants. For the 24-hour $PM_{2.5}$, 1-hour NO_2 and SO_2 NAAQS, the modeled H1H was averaged over five years of meteorology for the purpose of comparison to the SIL. Lead (Pb) does not have a designated SIL, however the Pb emissions from the project were modeled upon the full grid (and then subsequently run through the USEPA LEADPOST post-processor) to evaluate the project's NAAQS impact. For all other NAAQS and PSD increment averaging periods included in this demonstration, the H1H concentration modeled for all receptors for each meteorological data year simulated was computed and compared to the SIL. If the H1H impacts from the project source equal or exceed the SIL for a given pollutant, the significant impact area (SIA) for that pollutant and averaging period was calculated. The SIA for each pollutant and averaging period was determined by calculating the maximum distance at which impacts are greater than the SIL.

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. For NAAQS analyses, impacts due to off-site 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 inventory sources were added and credited, respectively to the project's impacts. Detailed discussions of each analysis are included in the following sections on a pollutant by pollutant basis.

The Class II area preliminary impact analysis evaluated the predicted off-property ground-level concentration impacts due to the project emissions for all criteria pollutants and averaging periods. Table 10-1 presents the comparison of the SIL to the predicted H1H concentrations for modeling using both meteorological datasets.

For the SIL modeling using the Airport meteorology, five pollutant/averaging periods required full cumulative modeling as the project's impacts were higher than the SIL. These are:

- 1-hour NO_2 (NAAQS);
- 1-hour SO_2 (NAAQS);
- 24-hour SO_2 (PSD increment);

- 24-hour PM_{10} (NAAQS and PSD increment);
- Annual PM_{10} (PSD increment);
- 24-hour $PM_{2.5}$ (NAAQS and PSD increment); and
- Annual $PM_{2.5}$ (NAAQS and PSD increment).

The SIA is the extent of the receptors for each respective pollutant and averaging period that are over the SIL. Table 10-1 also lists the distance to the furthest receptor for each triggered SIA. Aside from 1-hour NO_2, 1-hour and 24-hour SO_2 all the Airport runs over the SIL had a furthest extend at 6.5 km. The SIA for 1-hour NO_2 and SO_2 extends out to 13.9 km, 24-hour SO_2 out to 26.3 km.

For the SIL modeling using the Site meteorology, the following pollutant/averaging periods required full cumulative modeling as the project's impacts were higher than the SIL, they are:

- 1-hour NO_2 (NAAQS);
- 1-hour SO_2 (NAAQS);
- 24-hour SO_2 (PSD increment);
- 24-hour PM_{10} (NAAQS and PSD increment);
- Annual PM_{10} (PSD increment);
- 24-hour $PM_{2.5}$ (NAAQS and PSD increment); and
- Annual $PM_{2.5}$ (NAAQS and PSD increment).

The SIA is the extent of the receptors for each respective pollutant and averaging period that are over the SIL. Table 10-1 also lists the distance to the furthest receptor for each triggered SIA. All the Site runs over the SIL had a furthest extend under 7 km. The SIA for 1-hour NO_2 extends out to 13.9 km, the 1-hour SO_2 SIA extends out to 14.4 km, 24-hour SO_2 extends out to 27 km.

The $PM_{2.5}$ averaging periods require a slightly different methodology to determine the SIA receptor grid than the methodology determining the requirement of a $PM_{2.5}$ NAAQS analysis. The annual $PM_{2.5}$ PSD increment SIL methodology uses the maximum annual value for each of the five (5) years separately whereas the NAAQS SIL analysis averages the maximum annual averages over the five (5) years. Similarly the 24-hour PSD increment SIL is based on the overall H1H of the 24-hour predicted impacts versus taking the 5-year average of the 24-hour averages.

10.2 Significant Monitoring Concentrations

The maximum concentrations from the project were compared against the applicable monitoring *de minimis* concentration or SMC. Aside from 24-hour $PM_{2.5}$ and 24-hour SO_2, all the other criteria pollutants with SILs had predicted H1H impacts from the project less than their respective SMC. As noted previously, there is no SIL defined for lead. However, since the lead emissions for the project were over the SER, lead modeling was required. To assess the project's impact, the lead emissions were modeled for the project-only over the entire 10 km receptor grid. AERMOD was run for the monthly averaging period with an output "post-file" that recorded all the predicted ground concentrations for every receptor, for every month over the five year modeling period. For each of the meteorological datasets Pb runs, the resultant post-file was then input into the USEPA's lead post-processor, LEADPOST. This post-processor then takes the monthly averages for each receptor and calculates a 3-month rolling average. The maximum monthly average was then calculated and compared against the SMC of 0.1 $\mu g/m^3$. For both meteorological sets, the predicted maximum 3-month rolling average impacts were two orders of magnitude less than the defined SMC.

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. The applicable SMCs were summarized in Table 4-1. 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 noted in Section 9, AM/NS has been provided representative regional background data from nearby monitoring sites for all criteria pollutants.

It should be noted that in January 2013, the SMCs for $PM_{2.5}$ were vacated by the District of Columbia (DC) Circuit Court. As a result, a project that triggers PSD review for $PM_{2.5}$, as is the case for this Project, cannot rely on the SMC's to request a waiver of the preconstruction modeling requirement. Instead, AM/NS has used existing monitoring data from the Fairhope monitor (Monitor ID 01-003-0010) to address this requirement. While the Fairhope monitor is further (at 72.6 km) than the more proximal Chickasaw monitor (42.7 km) it is the most representative $PM_{2.5}$ monitor to the Project site (see Appendix A) in the region. Table 9-1 and Appendix B show that the design monitor value for 2016 – 2018 for 24-hour $PM_{2.5}$ (17 $\mu g/m^3$) is well below the NAAQS and representative of the area, and in fact the maximum predicted value of 6.5 $\mu g/m^3$ (associated with the modeling using the airport surface characteristics meteorology) from the Project sources would fit beneath the NAAQS (35 $\mu g/m^3$) if added to the ambient background concentration of 17 $\mu g/m^3$. Therefore, AM/NS requests that a monitoring data from Fairhope monitor will be used in lieu of preconstruction monitoring for 24-hour $PM_{2.5}$. The $PM_{2.5}$ design concentrations are listed in Appendix B.

Even though the 24-hour SO_2 SMC has not been vacated, a similar approach for which the maximum 24-hour predicted SMC value of 12.45 $\mu g/m^3$ (associated with the modeling using the facility surface characteristics) conservatively added to the ADEM provided (Appendix B) 1-hour SO_2 ambient background of 29 $\mu g/m^3$ (Chickasaw), which is representative of the area and would yield a combined concentration under the 24-hour SO_2 PSD Increment of 91 $\mu g/m^3$ (or under the revoked 24-hour SO_2 NAAQS of 365 $\mu g/m^3$). Therefore, AM/NS is requesting that the Chickasaw monitor will be used in lieu of preconstruction monitoring 24-hour SO_2.

Table 10-1 Significant Impact Level (SIL) and Significant Monitoring Concentration (SMC) Analysis

Pollutant	Averaging Period	SIL ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	AIRPORT		SITE	
				Max H1H ($\mu g/m^3$)	SIA (km)	Max H1H ($\mu g/m^3$)	SIA (km)
CO	1-hour[(a)]	2000	--	211.21	-	190.94	-
	8-hour[(a)]	500	575	134.10	-	150.39	-
Pb	Month[(b)]	--	1.0E-01	4.98E-03	-	5.26E-03	-
NO_2	1-hour[(c)]	7.5	--	20.91	13.9	22.28	13.9
	Annual[(d)]	1	14	0.42	-	0.40	-
PM_{10}	24-hour[(a)]	5	10	8.84	1.7	8.86	1.6
	Annual[(d)]	1	--	1.57	0.9	1.51	0.9
$PM_{2.5}$	24-hour[(e)]	1.2	4	8.06	6.5	7.79	6.4
	Annual [(f)]	0.2	--	1.41	3.5	1.38	3.2
SO_2	1-hour[(c)]	7.9	--	22.60	13.9	24.04	14.4
	3-hour[(a)]	25	--	22.92	-	24.22	-
	24-hour[(a)]	5	13	12.27	26.3	12.45	27.0
	Annual[(d)]	1	--	0.28	-	0.27	-

[(a)] Screening impacts based on high-1st-high predicted concentration for all 5 years modeled together.
[(b)] There is no SIL for lead. The predicted concentration is based on the 3-month rolling average (obtained using USEPA's LEADPOST post-processor) for comparison against the SMC.

[(c)] The 1-hour NO_2 and SO_2 screening impacts are based on the 5-year average high-1st-high daily maxima predicted concentrations for all 5 years modeled together.

[(d)] Screening impact is based on the maximum annual predicted concentration for all 5 years modeled separately.

[(e)] For the NAAQS, the screening impacts are based on 5-year average high-1st-high 24-hour maxima for all 5 years modeled together.

[(f)] For the NAAQS, the screening impacts are based on 5-year average high-1st-high annual maxima for all 5 years modeled together.

10.3 Cumulative Modeling

This section describes the methodology and results for all triggered cumulative impact analyses.

10.3.1 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. Additionally, for the particulate matter runs, the receptor grid was split such that receptors on and within Outokumpu's fence line were segregated and run separately excluding Outokumpu's emission impacts from within its own property. The modeling runs for the receptors outside of Outokumpu's fence line were run normally including the project, AM/NS existing facility and all offsite inventory sources.

In order to have a NAAQS exceedance, the total concentration at a specific time and location must exceed the NAAQS. A secondary 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 contributions are greater than the SIL. Table 10-2 shows the results of these NAAQS assessments for both the airport and site meteorological modeling runs. The results for the predicted particulate matter impacts both within and outside of the Outokumpu plant boundary have been merged for clarity. Except for two cases discussed below, all predicted criteria pollutant NAAQS impacts were below the threshold values and hence showed compliance with the NAAQS. Additionally, as noted previously, the predicted lead impacts from the project are added to Table 10-2, for reference only as these results are directly from the modeling conducted for SMC analysis.

Table 10-2 NAAQS Assessment Results

Pollutant	Ave Period	NAAQS (μg/m^3)	Back-ground (μg/m^3)	Predicted Concentration (μg/m^3)				
				Airport Met		Site Met		Highest Overall
				Predicted Conc.	Predicted Conc. + Background	Predicted Conc.	Predicted Conc. + Background	
NO_2	1-hr	188	31	2,759.49	2,790.49	2,741.50	2,772.50	2790.49
Pb	Month	1.5E-01	-	-	4.98E-03	-	5.26E-03	5.26E-03
$PM_{2.5}$	24-hr	35	17	16.93	33.93	16.54	33.54	33.93
	Annual	12	7.3	3.81	11.11	3.75	11.05	11.11
PM_{10}	24-hr	150	25	15.61	40.61	14.45	39.45	40.61
SO_2	1-hr	196	29	254.88 (294.43[a])	283.88 (323.43[a])	213.49 (239.27[a])	242.49	283.88

[a] *Predicted 1-hour SO_2 ground concentration based on modeling performed on an additional refined 100 m receptor grid (see Section 10.3.2)*

The only exceedances of the NAAQS occurred using both meteorology for the 1-hour NO_2 and 1-hour SO_2. At the maximum 1-hour NO_2 design value receptor (H8H, 2,790.49 μg/m^3) the contributions from the project were 0.084 μg/m^3. At the maximum 1-hour SO_2 design value (H4H, 323.43 μg/m^3), the contributions from the project were 0.06 μg/m^3.

However, the statistical standards (1-hour NO_2, 1-hour SO_2, and 24-hour $PM_{2.5}$) complicate a straightforward culpability analysis since the design values for each receptor are calculated in a two-step process as follows:

- First, the daily values (daily maxima for the 1-hour standards and 24-hour averages for the $PM_{2.5}$ standard) for each year and each receptor are sorted by rank.
- Second, for each receptor the five sets of yearly ranked values are averaged across the same rank over the five year modeling period.

The process of ranking and then averaging the daily values obliterates the timestamps which in turn makes tracking the exact culpability of a source or group of sources difficult to determine if an exceedance is predicted. To assist in the culpability analysis for these statistical standards, AERMOD contains an option to generate an output file of the maximum daily contributions from each source called a MAXDCONT file. These MAXDCONT files record all the daily maxima (for the 1-hour standards) and the daily averages (for $PM_{2.5}$) for each receptor for each year. Furthermore the MAXDCONT files record the specific modeled concentration contributions of the project, as well as the inventory sources for each of the daily values at each receptor for each year. In order to assure that the NAAQS are protected, the U.S. EPA recommends extracting the MAXDCONT culpability data up to a high enough rank at which no NAAQS exceedances are predicted[4]. Hence, for these exceedances, MAXDCONT culpability files were generated separating the project and the facility as a whole into distinct source groups. In order to assure protection of the NAAQS, the MAXDCONT values were generated up to the 150th rank for 1-hour NO_2 and up to the 100th rank for 1-hour SO_2. Analysis of the MAXDCONT files for the airport meteorology runs revealed the following:

- From the 1-hour SO_2 MAXDCONT file the project was shown to not significantly contribute to any of the modeled NAAQS exceedances because none of the project contributions to modeled NAAQS exceedances were above the relevant SIL; the project's peak contribution to any NAAQS exceedance was 3.30 μg/m^3 at the 4th rank with the airport meteorology.
    - For 1-hour SO_2 with the airport characteristics data, it was determined that out of 9,549 (1,200 additional refined 100-m spaced + 8,349 significant receptors) significant receptors modeled, 3,126 receptors exceed the NAAQS at the 4th highest ranking. Figure 10-2 shows the modeled receptors and resulting concentration isopleths. The peak concentration occurs at the 100-m spaced grid. The concentration isopleths show the area inside the 196 μg/m^3 contour where the NAAQS exceedances occur.
    - For 1-hour SO_2 with the site characteristics data, it was determined that out of 8,471 (1,200 additional refined 100-m spaced + 7,271 significant receptors) significant receptors modeled, 2,634 receptors exceed the NAAQS at the 4th highest ranking. The peak concentration occurs at the 100-m spaced grid, so no additional modeling was needed.
- From the 1-hour NO_2 MAXDCONT file the project was shown to not significantly contribute to any of the modeled NAAQS exceedances because none of the project contributions to

4 AERMOD User's Guide, 2016, available at: https://www3.epa.gov/ttn/scram/models/aermod/aermod_userguide.pdf. Accessed April 2017.

modeled NAAQS exceedances were above the relevant SIL; the project's peak contribution to any NAAQS exceedance was 6.76 µg/m³ at the 26th rank with the airport meteorology.

- For 1-hour NO_2 with the airport characteristics data, it was determined that out of 7,916 significant receptors modeled, 2,750 receptors exceed the NAAQS at the 8th highest ranking. Figure 10-3 shows the modeled receptors and resulting concentration isopleths. The peak concentration occurs at the 100-m spaced grid, so no additional modeling was needed. The concentration isopleths show the area inside the 188 µg/m³ contour where the NAAQS exceedances occur.

- For 1-hour NO_2 with the site characteristics data, it was determined that out of 6,693 significant receptors modeled, 2,311 receptors exceed the NAAQS at the 8th highest ranking. The peak concentration occurs at the 100-m spaced grid, so no additional modeling was needed.

Therefore, for all pollutant and averaging periods requiring full cumulative modeling using both sets of meteorology, the project was shown to be in compliance of the NAAQS.

10.3.2 Refinement of SIA Receptor Grid Spacing

As noted in Section 8, the modeling for this application was performed such that any predicted peak impact would be captured within a fine receptor grid spacing of 100 meters. This approach resolves the predicted peak impacts at a spatial scale fine enough for better ensuring that modeling captures the magnitude of the peak impact to within a 100 meter scaling. The only cumulative modeling predicted impact for which a refined modeling run which generated a peak impact at a distance outside of the 100 meter fine receptor grid was for the 1-hour SO_2 NAAQS modeling using the both meteorological data sets. The concentrations predicted with the airport data set resulted in higher concentrations than with the site characteristics data set, as shown in Table 10-2. Therefore, additional modeling with a refined grid presented here are with the airport data set only. The following were calculated based on the initial 1-hour SO_2 NAAQS run:

- Predicted peak ground concentration: 283.88 µg/m³
- Distance of initial peak from center of AM/NS emission sources: 10 km (placing the peak impact within 500 m grid spacing)

Figure 10-1 shows an isopleth contour plot of the initial predicted 1-hour SO_2 ground concentrations and the SIA receptor grid. Upon inspection of the contour map, an area (noted by the red box) was selected to cover peak concentrations.

For the refined grid, an area was selected that encompassed a predicted peak (shown in dark orange in Figure 10-1) from the initial modeling run. Figure 10-2 shows a zoomed-in isopleth of the predicted ground concentrations for the refined 100-m receptor grid. From the initial run, the predicted peak impact (283.88 µg/m³) has shifted south. Additionally the isopleth plot shows that the refined receptor grid increased the concentration from 283.88 µg/m³ to 323.43 µg/m³.

Figure 10-1 Predicted 1-hour SO_2 Ground Concentration (using the Airport meteorology) based on the Initial SIA Receptor Grid

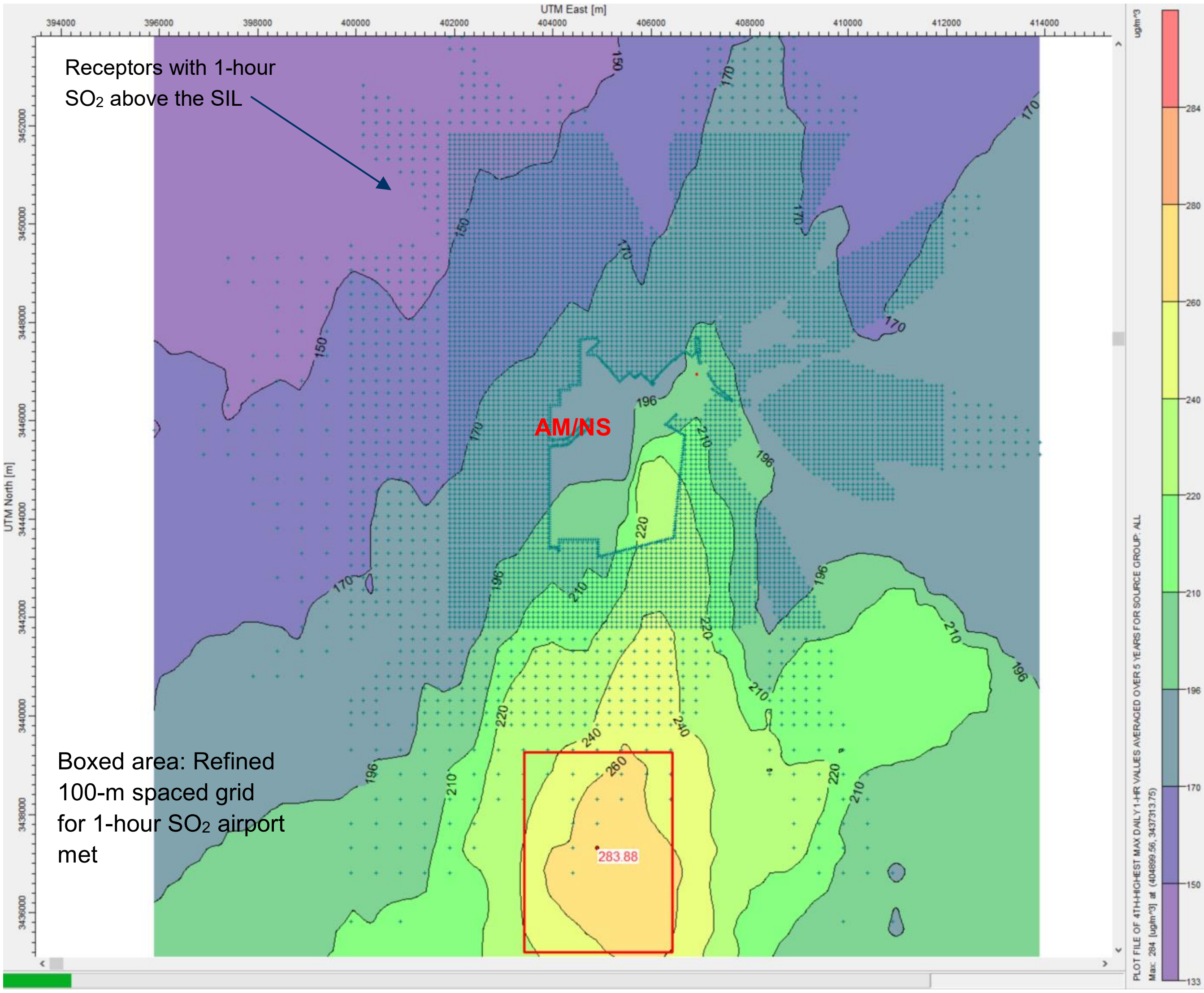


Figure 10-2 Predicted 1-hour SO_2 Ground Concentration (using the Airport meteorology) based on the Additional Refined 100m Receptor Grid

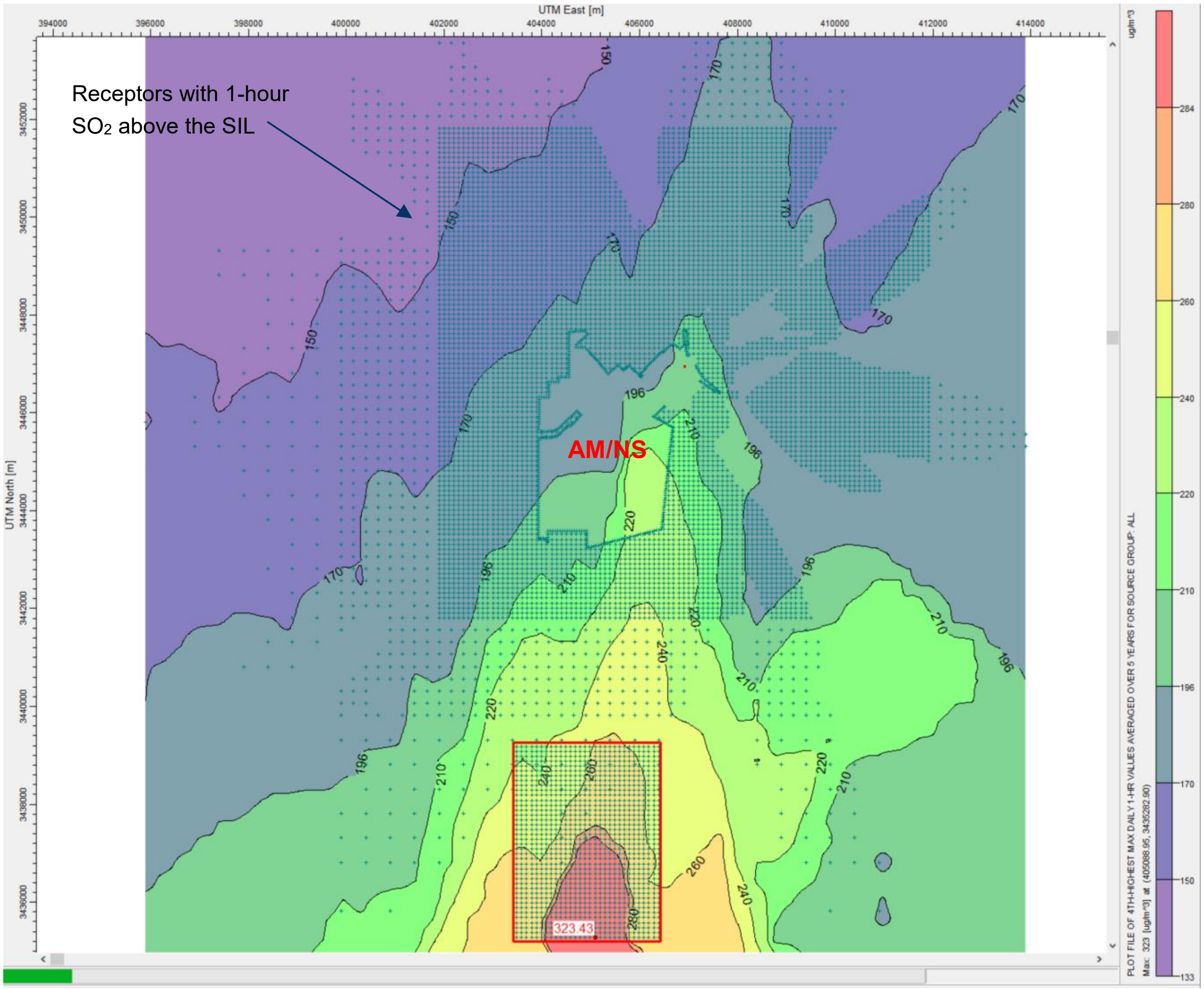
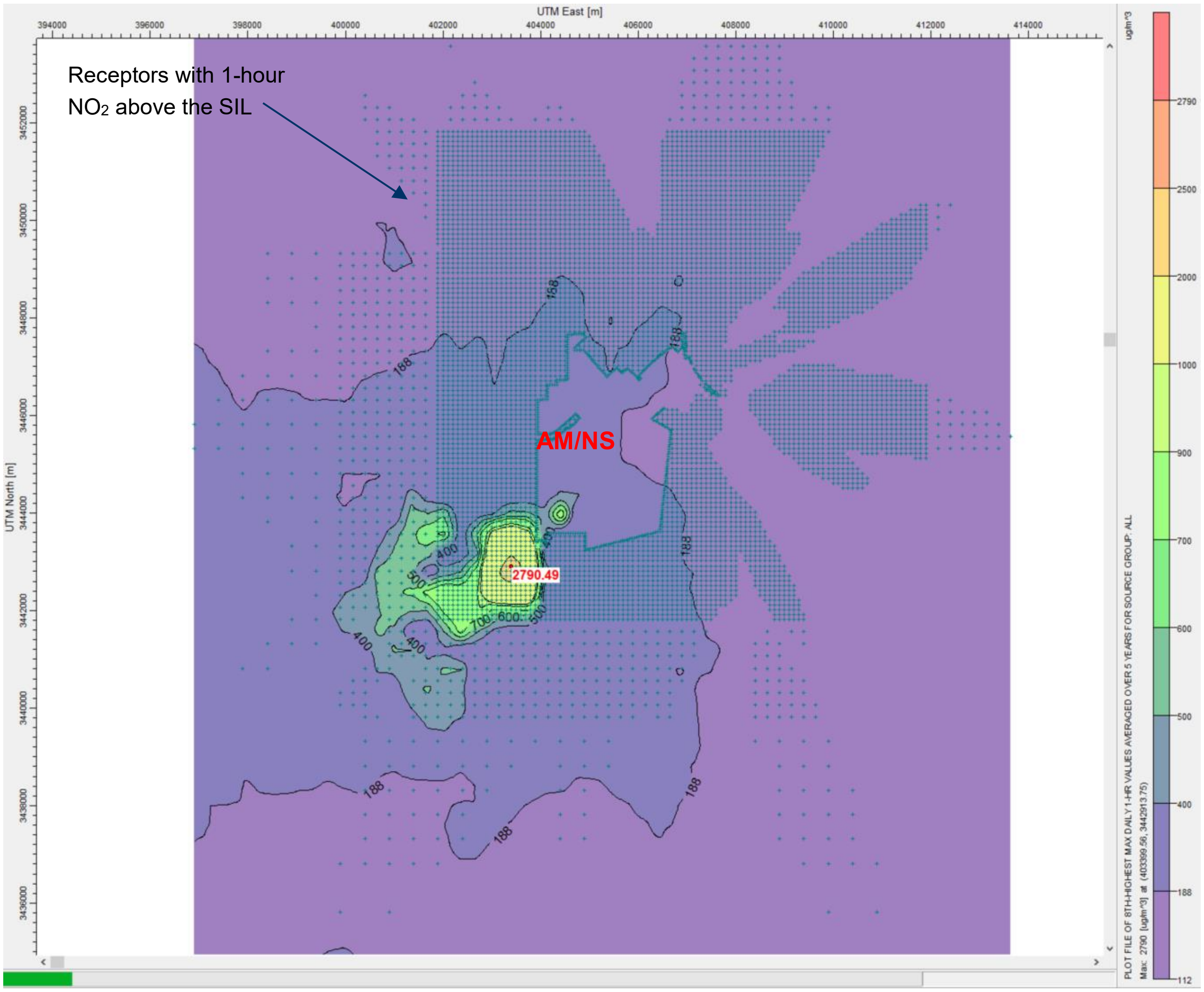


Figure 10-3 Predicted 1-hour NO_2 Ground Concentration (using the Airport meteorology)



10.3.3 PSD Increment Assessment

A Class II PSD increment modeling analysis was performed for 24-hour and annual $PM_{2.5}$, 24-hour and annual PM_{10} and 24-hour SO_2 (site meteorology only). 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 C 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 using both sets of meteorological data. Based on these results it is shown that emissions from the project, when assessed with other increment consuming and expanding sources, are in compliance with the PSD increment.

Table 10-3 PSD Increment Results

Pollutant	Averaging Period	PSD Increment (μg/m^3)	Predicted Concentration (μg/m^3)		
			Airport Met	Site Met	Highest Overall
$PM_{2.5}$	24-hr	9	8.48	8.39	8.48
	Annual	4	1.52	1.46	1.52
PM_{10}	24-hr	30	14.29	14.29	14.29
	Annual	17	2.16	2.21	2.21
SO_2	24-hr	91	7.86	7.63	7.86

10.4 Formation of Ozone and Secondary $PM_{2.5}$

The May 2017 revisions to the Appendix W Modeling Guidelines included a provision that requires major sources subject to NSR/PSD review to assess a project's impact on the formation of ozone and secondary $PM_{2.5}$. EPA proposed a two-tiered approach for assessing the impacts for these pollutants:

- Tier 1 involves using known relationships between precursor emissions and a source's impacts to qualitatively assess the impact on secondary $PM_{2.5}$ and ozone formation.
- Tier 2 involves a more detailed analysis and could involve application of a photochemical grid model to determine the secondary $PM_{2.5}$ and ozone impacts.

In order to aid in the determination of which Tier an application would fall under, EPA has published guidance to establish SILs for ozone and $PM_{2.5}$, and also establishing Modeled Emission Rates for Precursors (MERPs) as a potential Tier-1 demonstration tool. A MERP represents a level of precursor emissions that is not expected to contribute significantly to concentrations of ozone or secondarily-formed

$PM_{2.5}$. Impacts in excess of the MERPs would require an alternative Tier-1 approach or potentially a Tier-2 analysis.

On April 30, 2019, EPA released the finalized guidance memorandum[5] that described how MERPs could be calculated as part of a Tier I ozone and secondary $PM_{2.5}$ formation analysis to assess a project's emissions of precursor pollutants as they would relate to the ozone and $PM_{2.5}$ "critical air quality thresholds". AM/NS has utilized the 2019 MERPs guidance to assess the Project's impacts on ozone and secondary $PM_{2.5}$ formation.

10.4.1 EPA Tier 1 Screening of Ozone Impacts Using MERPs

The potential emissions of NO_X from the proposed Project are 678.53 tons per year (tpy) and the potential emissions of VOC are 482.45 tpy. The MERPs guidance provides modeling performed by EPA representing the maximum downwind ozone concentrations caused by NO_X and VOC emissions from hypothetical sources across the continental United States. EPA conducted photochemical modeling of hypothetical sources using emission rates of 500 tpy, 1,000 tpy, and 3,000 tpy of both NO_X and VOC for various locations throughout the US. Figure 10-4 is from the USEPA's MERPs finalized memorandum and it maps climate zones for the continental United States. Based on this figure, the initial selection of a hypothetical source would be drawn from the "Southeast" climate zone. Figure 10-5 shows a distribution of hypothetical example facilities from which one is to select the most appropriate source for the facility under review. The closest modeled source was found to be EPA Source 19, located in Alabama in Tallapoosa County. In addition to the close regional proximity of EPA Source 19, AM/NS selected this source as the most representative source based on the four criteria recommended by EPA for assessing representativeness, namely:

1. Terrain;
2. Rural vs. urban surrounding;
3. Humidity;
4. Average and peak temperatures

While Tallapoosa County is at a higher elevation than Calvert (~200 m vs. 25 m), it's terrain and rural surrounding are similar to those around Calvert. Additionally, as shown in Figure 10-6, the temperature and rainfall[6] (as a surrogate of humidity) seasonal climate data between Mobile Regional Airport (KMOB) and Thomas C. Russell Field Airport (KALX) in Tallapoosa County are comparable. Based on this review, the Tallapoosa County source is suitable to develop the appropriate MERP levels with which to assess the Project's emissions of precursors against the appropriate "critical air quality threshold". For the purpose of this analysis and per EPA guidance, the critical air quality threshold for ozone was considered to be the proposed ozone SIL of 1 ppb.

For the purpose of this analysis, AM/NS has considered MERP values derived from the model results for EPA Source 19 based on the 500 tpy case for NO_X and the 500 tpy case for VOC, as these are the closest approximations of the Project emission rates. Table 10-4 presents modeled ozone concentrations from Table A-1 of the MERPs guidance for Source 19.

[5] https://www.epa.gov/sites/production/files/2019-05/documents/merps2019.pdf

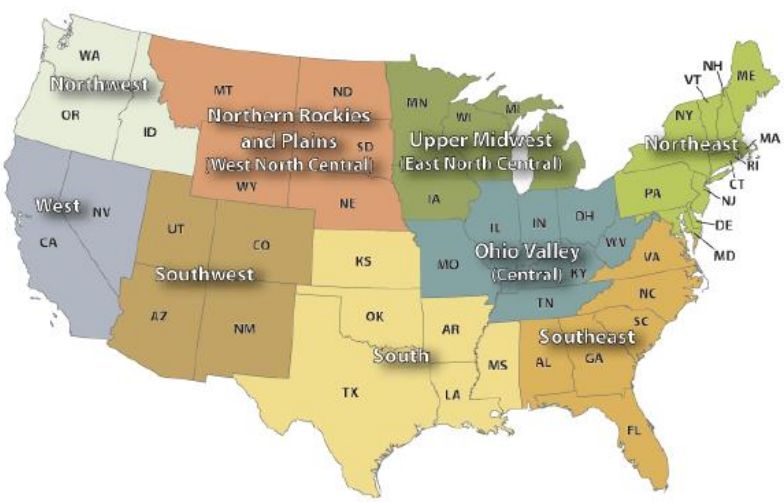
[6] Seasonal weather average plots obtained from Weather Underground. Note that the rainfall vertical axes are scaled differently between the two facilities.

Table 10-4 EPA Ozone Modeling Results – Source 19 (Tallapoosa County)

Precursor	Emissions (tpy)	Stack Height (m)	Maximum Modeled Ozone Concentration (ppb)[a]
NO_X	500	High (90 m)	1.530
VOC	500	High (90 m)	0.048

[a] *Values obtained from USEPA's spreadsheet: "Illustrative_merps_epa_modeling_2018deversion.xlsx,"*
Tabs: "MDA O3 NOX" and "MDA8 O3 VOC."

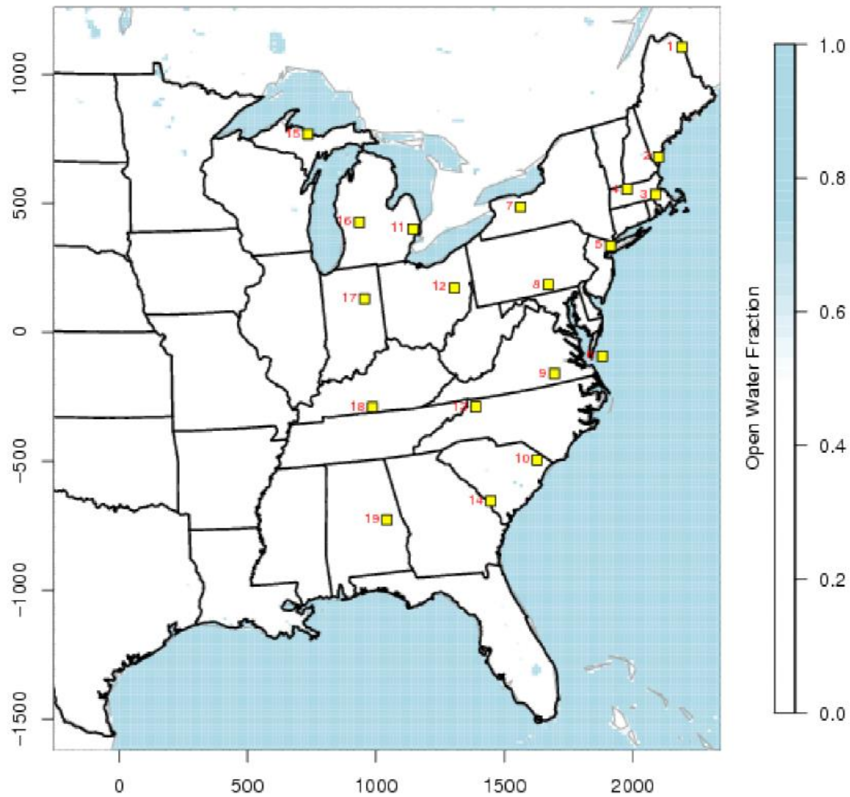
Figure 10-4 NOAA Climate Zone Map (with number of hypothetical sources modeled in each climate zone)



Climate Zone	Sources
Northeast	10
Southeast	9
Ohio Vally	19
Upper Midwest	12
Rockies/Plains	14
South	17
Southwest	15
West	6
Northwest	3

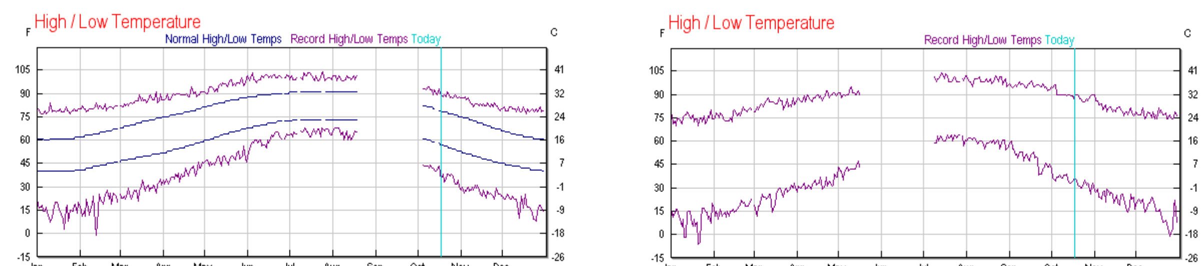
Source: Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program, USEPA (2019)

Figure 10-5 MERPs Eastern Model Domain and Hypothetical Sources

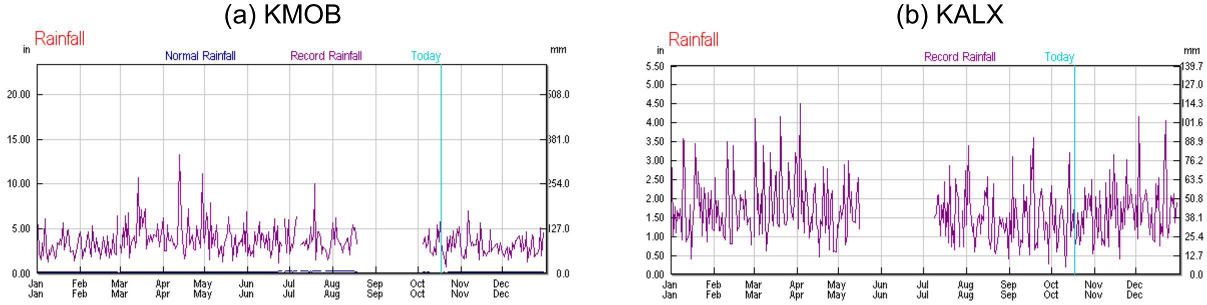


Source: Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program, USEPA (2019)

Figure 10-6 Comparison of Seasonal Temperature and Rainfall between Mobile Regional Airport (KMOB) and Thomas C. Russell Airfield (KALX)



(a) KMOB (b) KALX



Credit: Weather Underground.

The results of EPA's hypothetical source modeling presented in Table 10-4 can be used to derive appropriate MERP values for NO_X and VOC. The MERPs guidance specifies the following equation to derive a MERP:

MERP = Critical Air Quality Threshold * (Modeled emission rate from hypothetical source/ Modeled air quality impact from hypothetical source)

AM/NS used the proposed ozone SIL of 1 ppb to represent the critical air quality threshold. The SIL represents a *de-minimis* impact level, that is, if the maximum concentration of ozone due to a single source is less than the SIL, then it can be concluded that the source has an insignificant contribution to ozone formation. The high stack height model was selected due to the primary precursor emission sources at AM/NS being over 60 m. The resulting MERPs values are the following:

NO_X MERP = 1ppb * 500 tpy / 1.530 ppb = 327 tpy
VOC MERP = 1ppb * 500 tpy / 0.048 ppb = 10,417 tpy

The potential emissions of VOC from the project are below the MERP values calculated above. However, since the emissions of these ozone precursors each exceed the individually applicable PSD SERs, the MERPs guidance suggests that the total emission rate of precursors should be cumulatively evaluated with respect to the MERP levels. The following equation shows the Project's cumulative MERP consumption. A cumulative MERP consumption of less than 100% indicates that a project would not cause ozone concentrations exceeding the ozone SIL.

(Project NOx emissions (695.27 tpy)/NO_X MERP (327 tpy) +
(Project VOC emissions (260.16 tpy)/VOC MERP (10,484 tpy)) = 215%

The calculated cumulative consumption of the MERPs is 215%. Since the calculated consumption is over 100% a cumulative impact analysis is required. A review of regional monitors in the southern Alabama region is necessary to determine if the 215%, or 2.15 ppb, were to be added to the ozone background that the sum would be less than the ozone NAAQS of 70 ppb.

Table 10-5 EPA Ozone Monitor Results (ppb)

Monitor	Monitor ID	Design Value	Period	Form
Ward, Sumter County	01-119-0003	56.3 ppb	8hr	3 year average H4H

With the addition of 2.15 ppb of ozone from the MERPs analysis, the design value of 56.3 ppb rises to (56.3+2.15 =) 58.45 ppb, which is less than the standard of 70 ppb, and thus demonstrates passes the Tier 1 assessment for ozone.

10.4.2 Tier-1 Screening of Secondary $PM_{2.5}$ Impacts Using MERPS

In addition to the photochemical ozone modeling for various hypothetical sources across the US contained in the MERPs guidance, EPA provided photochemical modeling for secondary $PM_{2.5}$ formation from the same hypothetical sources due to emissions of $PM_{2.5}$ precursor pollutants NO_X and SO_2. The use of MERPs for NO_X and SO_2 to determine whether a project would have significant $PM_{2.5}$ impacts (i.e., exceed the applicable SILs) is complicated by the fact that a project's total impact on $PM_{2.5}$ air quality includes contributions from both precursor emissions and direct emissions of $PM_{2.5}$ from project sources. Section 10-1 of this report presents model results that indicate that the $PM_{2.5}$ SILs are exceeded due to directly emitted $PM_{2.5}$ alone. Therefore, calculation of MERPs would not be needed since the Project already has significant $PM_{2.5}$ impacts. However, the photochemical model results for hypothetical sources in the MERPs guidance can still serve as a resource to assess the potential contribution of secondary $PM_{2.5}$ to the total modeled concentrations due to the Project. The approach described in the following paragraphs represents a Tier 1 secondary $PM_{2.5}$ assessment, as described in Section 5.4.2(b) in the revised Guideline on Air Quality Models.

In order to assess the total $PM_{2.5}$ impact (primary or secondary), the percentage of the MERPs for the $PM_{2.5}$ precursors was multiplied by the Critical Air Quality Threshold, i.e. the SIL, and then added to the design value of the primary $PM_{2.5}$ impacts to assess the total impact. This approach is outlined below. This approach is a conservative measure, as primary $PM_{2.5}$ impacts in the near field, often at or just beyond the fence line, while the transformation of NO_2 and SO_2 into nitrates and sulfates typically peaks 7 to 10 km from the source.

Once again, for this analysis, AM/NS has considered MERP values derived from the model results for EPA Source 19, Tallapoosa County, AL based on the 500 tpy case for NO_X and the 1,000 tpy case for SO_2, as these are the closest approximations of the Project emission rates (NO_X: 695.27 tpy; SO_2: 675.24 tpy). Table 10-6 presents modeled secondary $PM_{2.5}$ concentrations from the MERPs guidance[7] for the 500 tpy NO_X and 1,000 tpy SO_2 Source 19 cases.

Table 10-6 EPA $PM_{2.5}$ Modeling Results – Source 19 (Tallapoosa Co., AL)

Precursor	Emissions (tpy)	Stack Height	Max. Modeled 24-hour Concentration ($\mu g/m^3$)	Max. Modeled Annual Concentration ($\mu g/m^3$)
NO_X	500	High (90 m)	0.05	0.001
SO_2	1,000	High (90 m)	0.40	0.009

For 24-hour $PM_{2.5}$, AM/NS used the proposed 24-hour $PM_{2.5}$ SIL of 1.2 $\mu g/m^3$ to represent the critical air quality threshold, while for the annual $PM_{2.5}$ SIL, 0.3 $\mu g/m^3$ was used. The percentage of each MERP was added together for a cumulative impact against the MERPs, then that percentage of the SIL was added to the impacts from primary $PM_{2.5}$ to compare the overall impacts against the NAAQS and PSD increments. Once again the high stack height case for both NO_X and SO_2 was chosen. The resulting MERPs values are the following:

24-hour $PM_{2.5}$

NO_X MERP = 1.2 $\mu g/m^3$ * 500 tpy / 0.05 $\mu g/m^3$ = 12,000 tpy
SO_2 MERP = 1.2 $\mu g/m^3$ * 1,000 tpy / 0.4 $\mu g/m^3$ = 3,000 tpy

[7] Values obtained from EPA "Illustrative_merps_epa_modeling_2018dec28version.xlsx; tabs: "Daily PM2.5 NOX", "Annual PM2.5 NOX", "Daily PM2.5 SO2" and "Annual PM2.5 SO2."

The AM/NS project potential emissions of NO_X (695.27 tpy) and SO_2 (675.24 tpy) were then used to calculate the impact of secondary $PM_{2.5}$ to be added to the primary $PM_{2.5}$ impacts. The following equation shows the Project's contribution to on secondary $PM_{2.5}$ concentrations.

(Project NOx emissions (695.27 tpy)/NO_X MERP (12,000 tpy) +
(Project SO_2 emissions (675.24 tpy)/SO_2 MERP (3,000 tpy)) = 28%

Therefore, the amount added to the primary $PM_{2.5}$ impacts to account for the contribution of 24-hour secondary $PM_{2.5}$ is (1.2 $\mu g/m^3$ * 0.28) = **0.34 $\mu g/m^3$**

Annual $PM_{2.5}$

NO_X MERP = 0.2 $\mu g/m^3$ * 500 tpy / 0.001 $\mu g/m^3$ = 100,000 tpy
SO_2 MERP = 0.2 $\mu g/m^3$ * 1,000 tpy / 0.009 $\mu g/m^3$ = 22,222 tpy

The potential Project emissions of NO_X (695.27 tpy) and SO_2 (675.24 tpy) were then used to calculate the impact of secondary $PM_{2.5}$ to be added to the primary $PM_{2.5}$ impacts. The following equation shows the Project's cumulative MERP consumption.

(Project NOx emissions (695.27 tpy)/NO_X MERP (100,000 tpy) +
(Project SO_2 emissions (675.24 tpy)/SO_2 MERP (22,222 tpy)) = 4.0%

Therefore, the amount added to the primary $PM_{2.5}$ impacts to account for the contribution of annual secondary $PM_{2.5}$ is (0.2 $\mu g/m^3$ * 0.04) = **0.007 $\mu g/m^3$**

Table 10-7 compares the combined primary and secondary $PM_{2.5}$ impacts to their respective NAAQS and PSD increments. As shown in the table, the combined impacts are all below their respective standards.

Therefore, based on the Tier-1 screening using MERPs, the Project is not expected to have a significant impact on ambient ozone, and the combined impacts of primary and secondary $PM_{2.5}$ has been demonstrated to be below the NAAQS and PSD increments. Therefore, no further analysis is necessary.

Table 10-7 Primary and Secondary $PM_{2.5}$ Modeling Results

Period	AERMOD Results ($\mu g/m^3$)			NAAQS / Increment
	Direct only	Secondary $PM_{2.5}$	Total $PM_{2.5}$ Impact	
24-hour NAAQS	33.93	0.34	34.27	35
Annual NAAQS	11.44	0.007	11.44	12
24-hour Increment	8.48	0.34	8.82	9
Annual Increment	1.52	0.007	1.52	4

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, AM/NS does not anticipate suppliers to locate within the surrounding area. With respect to residential growth, AM/NS anticipates that employment at the facility will increase by approximately 200 full time personnel due to the proposed Project.

AM/NS 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[8]. As shown in Table 10-1, the Project modeling results indicate that concentrations for CO, annual and 3-hour SO_2, annual NO_2 are below the SILs and therefore, the projects impacts for these pollutants are insignificant and do not require any additional modeling.

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 with the exception of 1-month NO2, 1-hour SO2 and annual SO2. As described in Section 10.3, the Project does not significantly contribute to these exceedances and they are caused by the modeled background sources. Therefore, the Project will not have a significant impact on soils and vegetation.

[8]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)
PM_{10}	24-hour	40.61	--	150
$PM_{2.5}$ (primary + secondary)	24-hour	34.27	--	35
	Annual	11.44	--	15
NO_2 (1)	4-hour	2,790.49	3,760	--
	8 hour	2,790.49	3,760	--
	1-month	2,790.49	564	--
SO_2	1-hour	323.43	917	--
	24-hour	323.43	--	260

(1) For 4-hour, 8-hour, and 1-month NO_2, the model-predicted 1-hour NO_2 NAAQS was conservatively used.

11.3 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 1-hour NO_2 SIA (13.9 km using both the airport and site meteorology) which is larger than the 24-hour PM_{10} SIA (1.6 km using the site meteorology and 1.7 km for the airport).

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. Because the Class I area is greater than 100 km from AM/NS, ADEM does not require AM/NS to address the modification's impact on PSD Increment at the Class I Area. The Federal Land Managers 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 (1,013.98 tpy of SO_2 + 1,025.82 tpy of NO_x + 672.50 tpy of PM_{10})/130 km = 20.86. Because this factor is above the screening level of 10, an AQRV analysis for the Breton Wildlife Refuge was required by Fish and Wildlife.

APPENDIX A JUSTIFICATION FOR ALTERNATE $PM_{2.5}$ AMBIENT BACKGROUND MONITOR

AM/NS Calvert, LLC
Calvert, Alabama

Appendix A: Justification for Alternate $PM_{2.5}$ Ambient Background Monitor

May 2019

Project No.: 0426226

Proposed Use of Fairhope $PM_{2.5}$ Ambient Air Monitor for Use in AM/NS Calvert Melt Shop Expansion Cumulative NAAQS Modeling

March 4, 2019

Introduction

On February 16, 2018, ADEM provided ERM (via correspondence between Joe Gross and Jim Owen) with ambient air background values for criteria pollutants to be used in the PSD modeling for the proposed AM/NS Calvert, LLC (AM/NS) Melt Shop expansion in Calvert, AL. ADEM had recommended use of the Chickasaw $PM_{2.5}$ ambient air background monitor (AQS No. 01-097-0003). The Fairhope (AQS No. 01-003-0010) $PM_{2.5}$ monitor located in Baldwin County, AL due to both its close proximity to Calvert, AL and its more representative surroundings for AM/NS, may be more representative of the $PM_{2.5}$ ambient air background surrounding the AM/NS Calvert area.

For including the ambient air component in cumulative modeling conducted for a PSD project, EPA in the 2017 *Revisions to the Guideline on Air Quality Models* (40 CFR Part 51, Appendix W, section 8.3.2.b), recommends:

> *The EPA recommends use of the most recent quality assured air quality monitoring data collected in the vicinity of the source to determine the background concentration for the averaging times of concern. In most cases, the EPA recommends using data from the monitor closest to and upwind of the project area. If several monitors are available, preference should be given to the monitor with characteristics that are most similar to the project area. If there are no monitors located in the vicinity of the new or modifying source, a "regional site" may be used to determine background concentrations. A regional site is one that is located away from the area of interest but is impacted by similar or adequately representative sources.*

The Chickasaw monitor is approximately 45 kilometers (km) to the south-southwest of the AM/NS site, and is the closest $PM_{2.5}$ monitor of any considered. While it is the closest monitor, the other factors recommended by EPA and described in this document reveal that $PM_{2.5}$ measurements taken at the Fairhope monitor provide a better representation of expected $PM_{2.5}$ concentrations in the area surrounding the AM/NS site. The following factors were taken into account for proposing the Fairhope monitor as an alternate $PM_{2.5}$ monitor, and are described further in this document:

1. Representativeness, including (in order of assessment):
   a. Relative Location
      i. Proximity to site
      ii. Relative upwind location of monitor
   b. Comparable surrounding land use: rural versus urban
   c. Cumulative emissions within a 50 km radius
   d. Measurement scale of monitor
      i. Temporal
      ii. Spatial
2. Completeness, i.e. sufficient data coverage

Representativeness: Relative Location

Proximity

EPA recommends "using data from the monitor closest to and upwind of the project area.' Figure 1 shows a 100 km ring around the AM/NS facility; $PM_{2.5}$ monitors are noted by blue diamonds. Only two $PM_{2.5}$ monitors, Chickasaw and Fairhope, are within 100 km of AM/NS Calvert.

Wind flow:

For an upwind assessment we reviewed the predominant wind flow for Mobile Airport from 2014 – 2018 (the proposed modeling period). The wind rose (Figure 2) of the Mobile Airport surface winds reveals a strong land-sea breeze component (i.e. winds from the north and southeast) with the predominant vector averaged bulk wind direction from the northeast (represented by the red line in the wind rose). However, given that both Calvert, AL is roughly 50 km from Mobile Bay, and that there are no complicating geographic features, a more zonal flow from the west was also assessed. Hence, upwind flow from the north, northeast, southeast and west were considered for evaluating alternate monitors.

Figure 1: $PM_{2.5}$ Monitors near AM/NS Calvert.

100 km Radius around AM/NS in red. $PM_{2.5}$ Monitors are noted by blue diamonds.

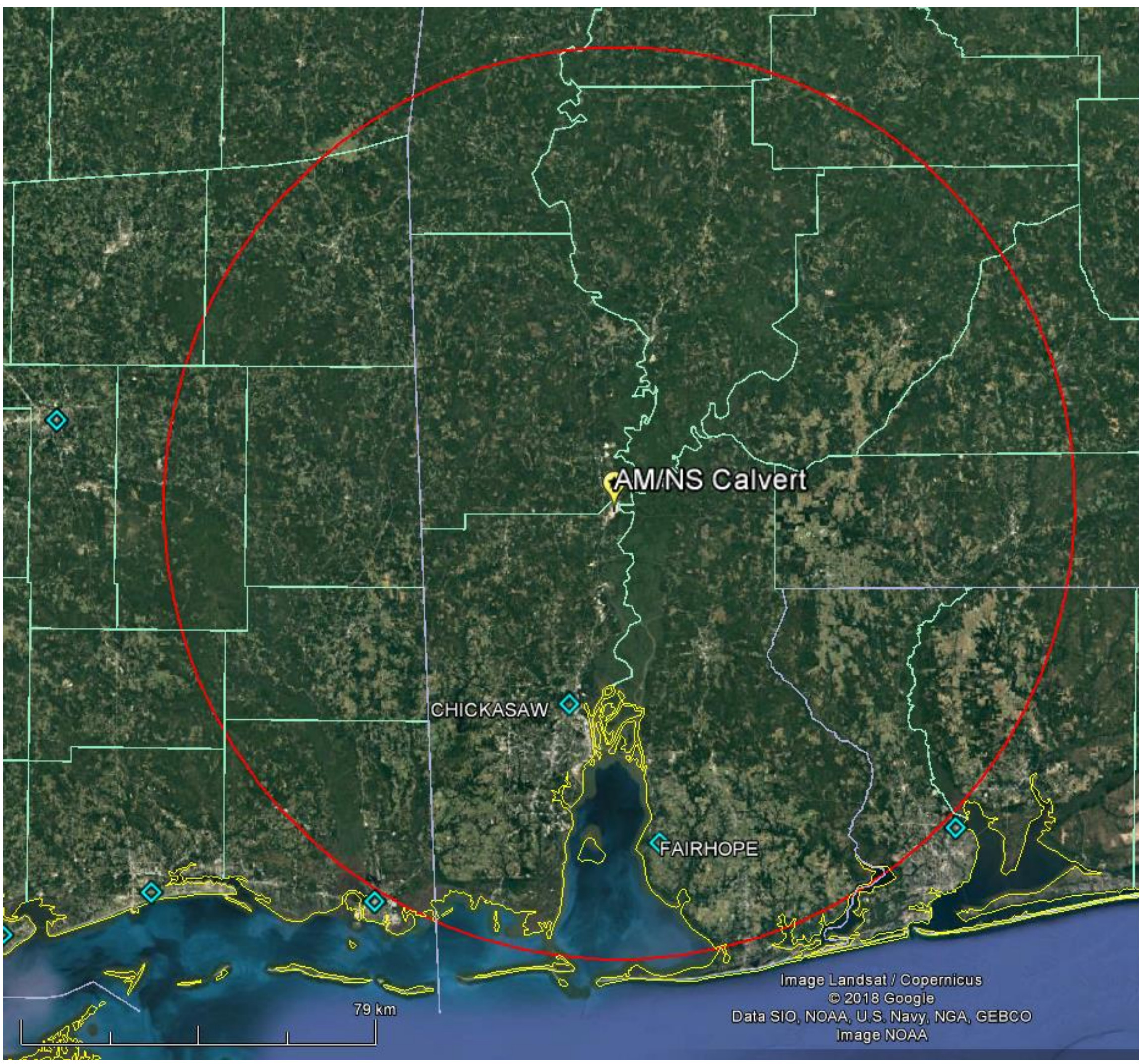
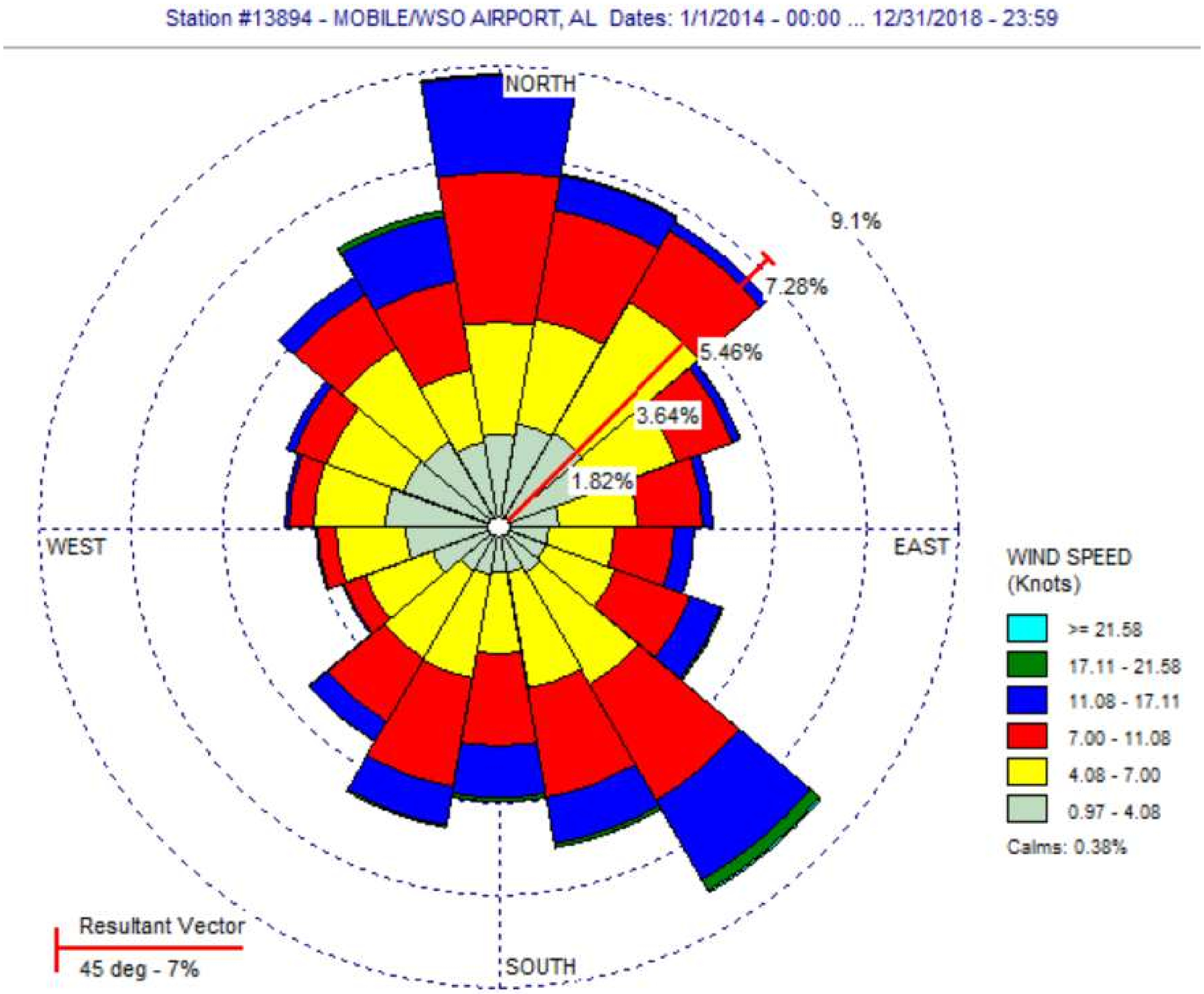


Figure 2: Wind Rose of Surface Winds from Mobile Airport (2014 – 2018)



Red line represents vector-averaged mean bulk wind direction

Representativeness: Comparable Land Use (Rural versus Urban)

Section 8.3.2.b of Appendix W states that the monitor selected for the cumulative modeling analysis should have "characteristics that are most similar to the project area." The area within a 10 km radius circle centered at AM/NS can be characterized as primarily rural (Figure 3). For comparison, the Chickasaw monitor is located at the north-northeast edge of the Mobile metropolitan area (Figure 4). The Chickasaw monitor (45 km to the south-southwest of AM/NS) is regional monitor and thus is optimized to sample out for hundreds of kilometers. Thus Chickasaw is sampling ambient air that includes urban emissions from Mobile and is thus not characteristic of the more rural ambient air surrounding AM/NS. Additionally Chickasaw's location due south of AM/NS is not representative of any of the predominant wind flow directions (north, northeast, southeast or west) suggested by the 5-year wind rose. Unfortunately since the Chickasaw monitor reports once every three days, it is impossible to conduct a flow analysis to exclude any specific record from the direction of Mobile due to the coarse temporal resolution.

The next closest monitor to AM/NS is the Fairhope monitor located 74 km to the south-southeast of AM/NS Calvert. Thus Fairhope's location is representative as being upwind for sea breeze flow. Figure 5 shows the 10 km area around the Fairhope monitor (AQS No. 01-003-0010). While the area surrounding Fairhope is less built-up than the Chickasaw monitor, about 30% of the nearby Fairhope area is over Mobile Bay. However, the Fairhope monitor is calibrated as a "neighborhood" monitor and is thus optimized for sampling out to 4 km and hence would not be capturing a majority of sea salts.

Figure 3: Aerial of 10 km Radius around AM/NS; Calvert, AL

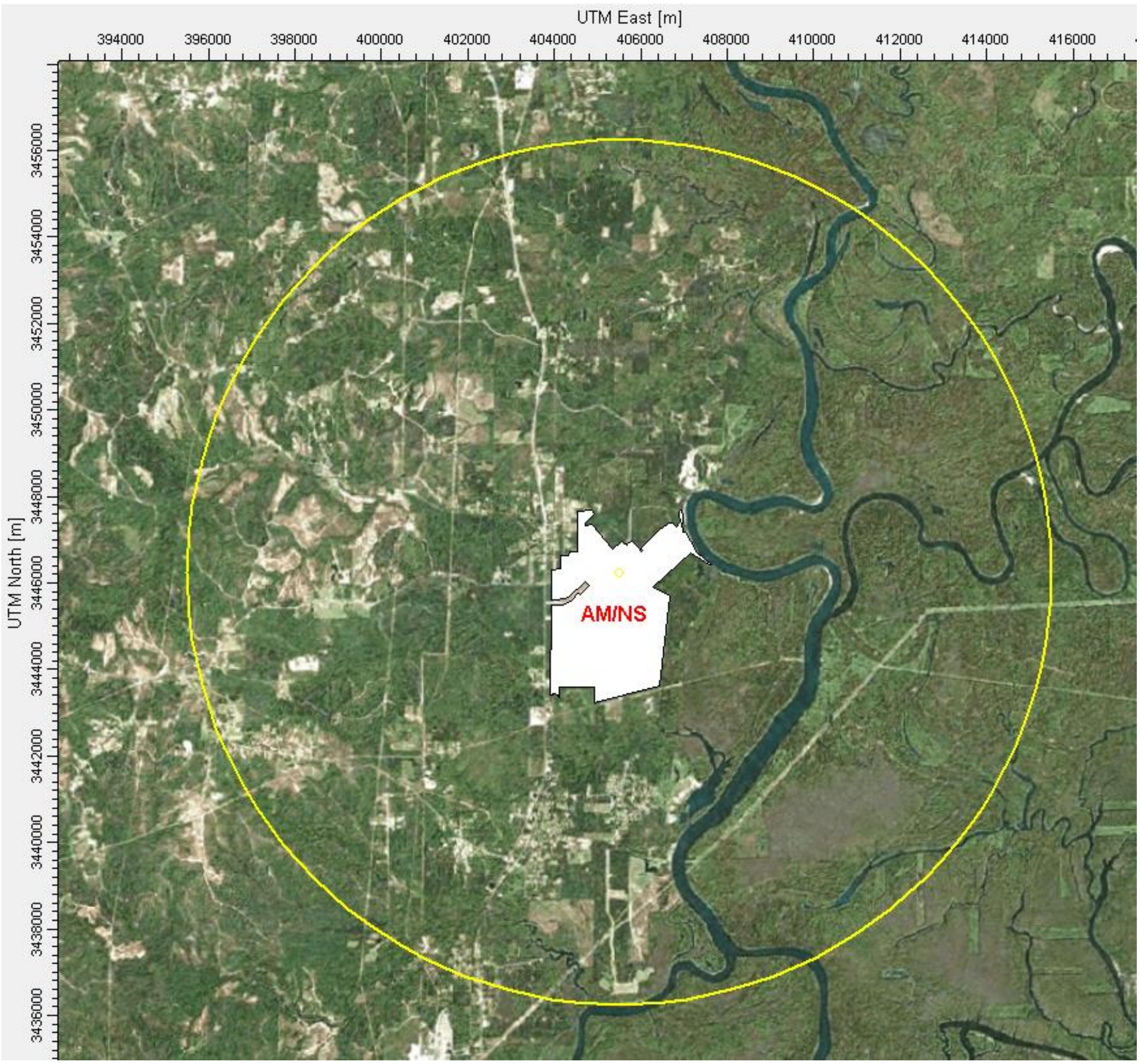


Figure 4: Aerial of 10 km around Chickasaw Monitor; Chickasaw, AL

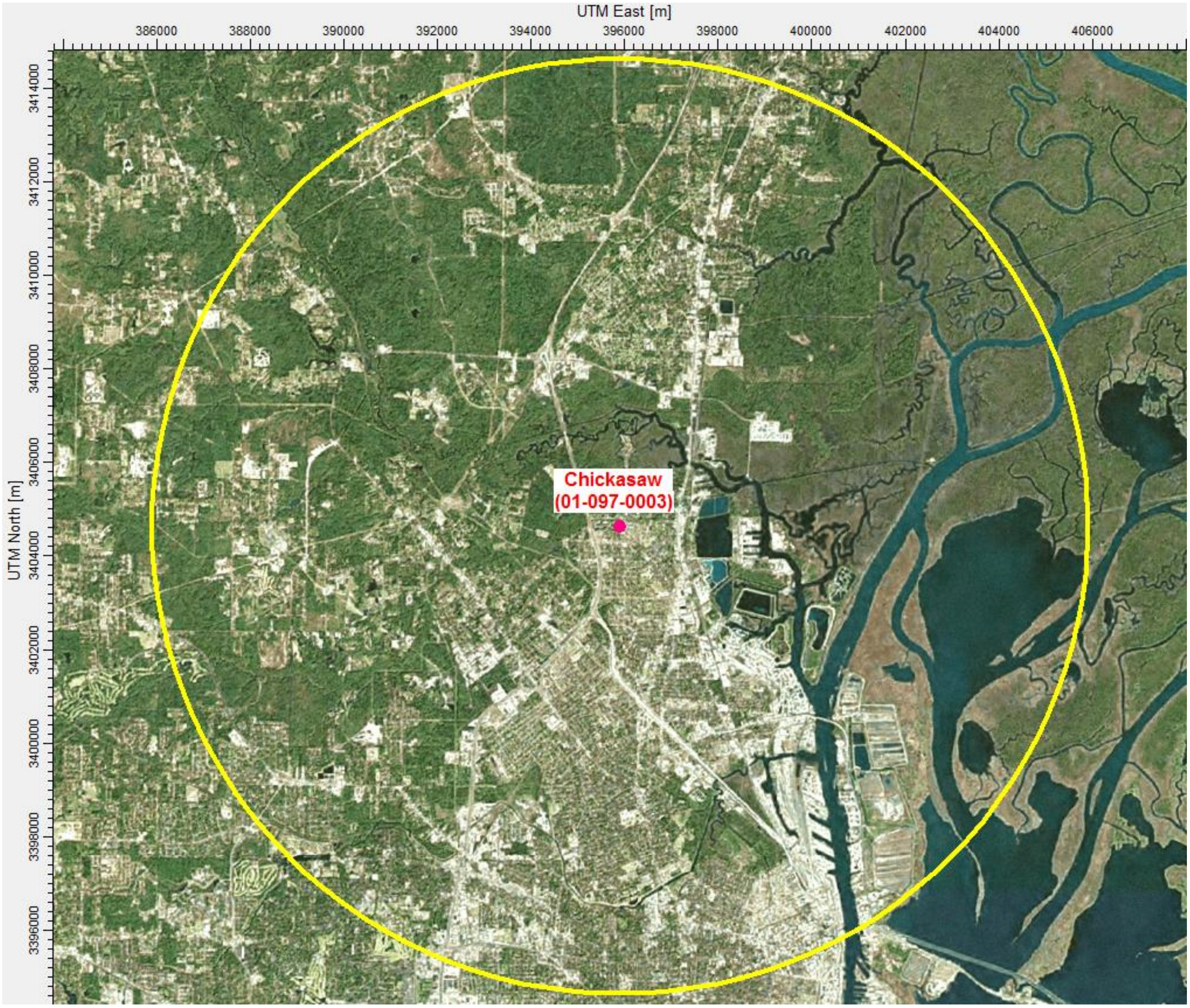
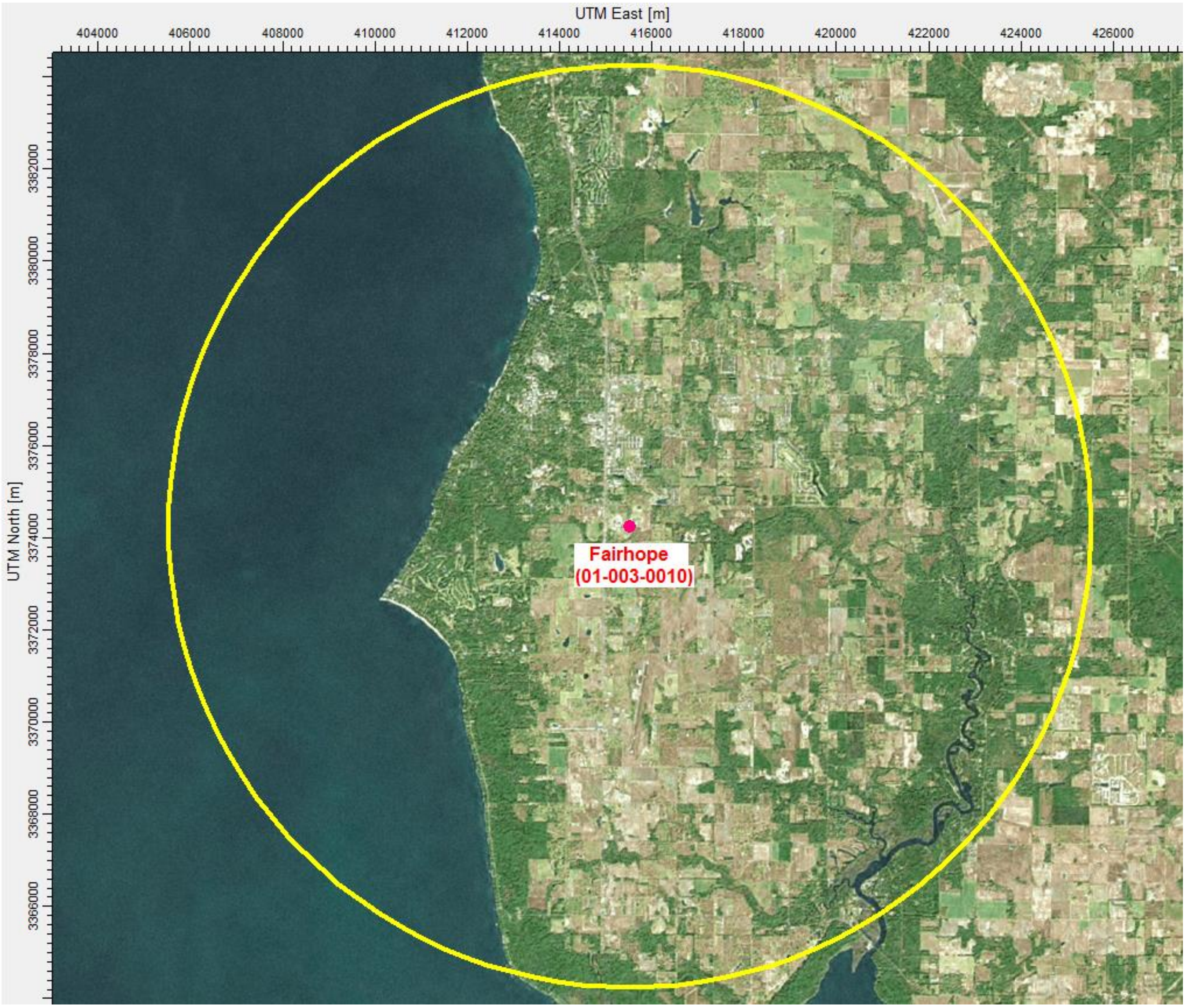


Figure 5: Aerial of 10 km around Fairhope Monitor; Fairhope, AL



Representativeness: Surrounding Cumulative Emissions

In lieu of a nearby upwind monitor that is representative of the project, EPA recommends the use of a "regional site" that is "located away from the area of interest but is impacted by similar or adequately representative sources." In order to optimize the selection of a distant but more representative monitor, an assessment of the surrounding cumulative point source emissions was reviewed using the National Emissions Inventory (NEI) 2014 database, the latest publically available version. Non-point sources were not included as the NEI non-point database mainly sample from residential and agricultural sources as well as the data being provided only on a countywide basis, which limits the precision for assessing an upwind contribution for each site. Point source emissions were summed over the 50 km radius around AM/NS and used a benchmark to compare similar 50 km circles for monitors in the surrounding area, particularly upwind, both northeast and west of the site (based on analysis of the surface winds in Figure 1 and the expected more zonal flow inland). The cumulative $PM_{2.5}$ emissions are presented in Table 1 ordered in increasing distance from AM/NS. While the nearby Chickasaw and Fairhope monitors are located in regions with $PM_{2.5}$ emissions similar to the Calvert area, it is believed that both monitors may also be sampling both urban and sea spray $PM_{2.5}$ that are not characteristic of the more rural and inland AM/NS Calvert area. Extending the upwind range for other monitors reveals Mississippi Gulf Coast $PM_{2.5}$ monitors that reveal emissions an order of magnitude higher than those surrounding AM/NS Calvert.

Table 1: 50 km Radius Cumulative $PM_{2.5}$ Emissions based on 2014 National Emissions Inventory

SITE	UTM (m)		State	County	Measurement Scale		Distance (m)	2014 NEI Emissions (tons)
	X	Y			Spatial	Temporal		
AM/NS-Facility	405846.2	3446201.	AL	Mobile	--	--	0.0	20
Chickasaw	395904.5	3404638.2	AL	Mobile	REGIONAL	Every 3rd Day	42.7	35
Fairhope	415526.2	3374241.4	AL	Baldwin	NEIGHBORHOOD	Every 3rd Day	72.6	36
Pascagoula	352611.7	3361701.7	MS	Jackson	NEIGHBORHOOD	Daily	99.9	747
Hattiesburg	282367.3	3467729.1	MS	Forrest	NEIGHBORHOOD	Every 3rd Day	125.3	168
Gulfport	303061.3	3363825.3	MS	Harrison	NEIGHBORHOOD	Daily	131.7	361
Waveland	269586.4	3354552.4	MS	Hancock	URBAN	Daily	164.2	112

Representativeness: Measurement Scale

As noted EPA recommends that a distant site, should both be representative regarding cumulative emissions compared to the project site as well as being "regionally" representative. Measurement scales for different $PM_{2.5}$ monitor types differ both temporally and spatially. Temporally $PM_{2.5}$ monitors can measure in a range from daily to once every sixth day. Aside from a group of monitors along the Mississippi Gulf Coast which are daily monitors, the other potential monitors are every-third-day monitors. The preference is to use a monitor that measures at least once every third day. Spatially, the monitors can measure on a neighborhood (500 m to 4 km range), urban (4 km to 50 km) or regional (50 km to hundreds of km) scale. As previously mentioned, the regional scaling of the Chickasaw monitor will oversample urban emissions which are not representative of the AM/NS area. Furthermore the neighborhood scaling of the Fairhope monitor would limits sampling from sea salts and thus not bias the data.

Data Completeness

A finally, a valid and sufficient ambient air sampling record is needed to be used in a NAAQS cumulative modeling analysis. The data coverage or completeness of the monitors most representative of the AM/NS area are shown in Table 2. The data for this assessment was obtained from the Air Quality System Data Mart. Values for 2018 are tentative as the 2018 data won't be verified as valid until the end of the first quarter of 2019. Inspection of the quarterly capture for Fairhope yields values for each quarter of at least 80%, well above the 75 percent requirement for each quarter as per EPA's *Interpretation Of The National Ambient Air Quality Standards For $PM_{2.5}$* (40 CFR Part 50, Appendix N).

Table 2: $PM_{2.5}$ Ambient Air Data Coverage

Monitor	Data Coverage			
	2015	2016	2017	2018
Chickasaw	94%	99%	91%	90%
Fairhope	93%	99%	90%	87%

Conclusions

Based on EPA's 2017 Appendix W guidance and review of representativeness and completeness of regional monitors surrounding AM/NS area, the Fairhope $PM_{2.5}$ ambient air monitor is proposed as the location best suited to develop the background contribution used in the AM/NS Calvert melt shop expansion cumulative air modeling. While located close to Mobile Bay, ERM believes it is the most representative and complete monitor based on the following assessments:

- Fairhope is the most proximal monitor characteristic of the surrounding rural land use to AM/NS;
- Fairhope is not downwind of the facility and hence free of any complicating contributions from the facility or other modeled inventory sources;
- Fairhope is similar in its surrounding emissions profile to the cumulative emission around the AM/NS facility;
- The monitor is sufficient in its temporal resolution measuring once every third day;
- The Fairhope $PM_{2.5}$ monitor is optimized for measuring on a neighborhood spatial scale which should limit its sampling of sea salts from Mobile Bay; and
- The data coverage for Fairhope is acceptable for the last four years, particularly the 2015 – 2017 period.

APPENDIX B ADEM-PROVIDED AMBIENT BACKGROUND CONCENTRATIONS FOR SO_2 AND $PM_{2.5}$

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
PRELIMINARY DESIGN VALUE REPORT

Report Date: Sep. 16, 2020

Pollutant: Sulfur dioxide(42401)
Standard Units: Parts per billion(008)
NAAQS Standard: SO2 1-hour 2010
Statistic: Annual 99th Percentile **Level:** 75

Design Value Year: 2018
REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.
State Name: Alabama

		2018			2017			2016			3-Year	
Site ID	STREET ADDRESS	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Design Value	Valid Ind.
01-097-0003	Iroquois and Azalea, CHICKA	4	10	Y	3	10 *	Y	4	13	Y	11	Y

Notes: 1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
PRELIMINARY DESIGN VALUE REPORT

Report Date: Sep. 16, 2020

Pollutant: Site-LevelPM2.5 - Local Conditions(88101)
Standard Units: Micrograms/cubic meter (LC)(105)
NAAQS Standard: PM25 24-hour 2012 / PM25 Annual 2012
Statistic: Annual Weighted Mean **Level:** 12
Statistic: Annual 98th Percentile **Level:** 35

Design Value Year: 2018
REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.
State Name: Alabama

	2018					2017					2016					24-Hour		Annual	
Site ID / STREET ADDRESS	Cred. Days	Comp. Qrtrs	98th Perctil	Wtd. Mean	Cert& Eval	Cred. Days	Comp. Qrtrs	98th Perctil	Wtd. Mean	Cert& Eval	Cred. Days	Comp. Qrtrs	98th Perctil	Wtd. Mean	Cert& Eval	Design Value	Valid Ind.	Design Value	Valid Ind.
01-003-0010 FAIRHOPE HIGH SCHOOL, 1 PIRATE DRIVE, FAIRHOPE, ALABAMA	107	3	17.1	7.1*	Y	110	4	18.9	7.4	Y	121	4	13.8	7.2	Y	17	Y	7.3	Y

Notes: 1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

APPENDIX C EXISTING AM/NS FACILITY SOURCE EMISSIONS AND STACK PARAMETERS

Table C-1: Non-Affected AM/NS Sources		**Potential to Emit**					**Location & Stack Parameters**						**Date Operation Began**
Source ID	**Description**	**PM_{10} (g/s)**	**$PM_{2.5}$ (g/s)**	**CO (g/s)**	**SO_2 (g/s)**	**NOx (g/s)**	**UTM East (m)**	**UTM North (m)**	**Stack Height (m)**	**Stack Temperature (K)**	**Stack Velocity (m/s)**	**Stack Diameter (m)**	
S1	Walking Beam Furnace #1	**7.93E-01**	**7.93E-01**	**3.73E+00**	**6.39E-02**	**9.05E+00**	406,550.21	3,447,068.50	66.18	623.15	5.15	5.08	(on or before) June 2010
S2	Walking Beam Furnace #2	**7.93E-01**	**7.93E-01**	**3.73E+00**	**6.39E-02**	**9.05E+00**	406,567.64	3,447,085.97	66.18	623.15	5.15	5.08	(on or before) June 2010
S3	Walking Beam Furnace #3	**7.93E-01**	**7.93E-01**	**3.73E+00**	**6.39E-02**	**9.05E+00**	406,585.18	3,447,103.15	66.18	623.15	5.15	5.08	(on or before) June 2010
S5	Finishing Mill with Wet ESP	**8.99E-01**	**8.89E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	406,260.75	3,446,870.34	65.00	313.15	56.51	1.12	(on or before) June 2010
S5a	Roughing Mill with Wet ESP	**2.70E-01**	**2.67E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	406,362.63	3,446,981.38	65.00	313.15	16.95	1.12	(on or before) June 2010
S6	Continuous Pickling Line #1 - Processor/Stretcher/Leveler with Baghouse	**4.90E-01**	**3.80E-01**[9]	**0.00E+00**	**0.00E+00**	**0.00E+00**	405916.32	3446524.51	60.00	303.15	18.25	1.32	(on or before) June 2010
S7	Continuous Pickling Line #2 - Processor/Stretcher/Leveler with Baghouse	**4.90E-01**	**3.80E-01**[7]	**0.00E+00**	**0.00E+00**	**0.00E+00**	405851.91	3446564.52	60.00	303.15	18.25	1.32	(on or before) June 2010
S8	Continuous Pickling Line #1 Pickling Tank with Scrubber	**1.02E-01**	**9.90E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405782.25	3446398.00	33.55	313.15	8.76	0.90	(on or before) June 2010
S9	Continuous Pickling Line #2 Pickling Tank with Scrubber	**1.02E-01**	**9.90E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405772.03	3446490.91	33.55	313.15	8.76	0.90	(on or before) June 2010
S10	Tank Farm Scrubber	**9.87E-02**	**9.62E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405810.77	3446652.78	24.99	353.15	25.69	0.56	(on or before) June 2010
S12	Continuous Pickling Line #1 - Tandem Mill with Mist Eliminator	**1.81E+00**	**1.79E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405653.42	3446264.86	33.50	303.15	14.54	3.00	(on or before) June 2010
S14	Roll Shop - Chrome Plating with Mist Eliminator	**3.89E-04**	**3.89E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405797.79	3446464.53	33.49	293.15	19.38	0.97	(on or before) June 2010
S15	CHDGL-1 Cleaning Section and Dryer with Mist Eliminator	**7.18E-02**	**7.07E-02**	**1.42E-02**	**1.42E-04**	**1.42E-02**	405533.13	3446182.46	44.00	343.00	11.93	0.80	(on or before) June 2010
S16	CHDGL-2 Cleaning Section and Dryer with Mist Eliminator	**7.18E-02**	**7.07E-02**	**1.42E-02**	**1.42E-04**	**1.42E-02**	405435.42	3446283.18	44.00	343.00	11.93	0.80	(on or before) June 2010
S17	CHDGL-3 Cleaning Section and Dryer with Mist Eliminator	**7.18E-02**	**7.07E-02**	**1.42E-02**	**1.42E-04**	**1.42E-02**	405571.40	3446143.02	44.00	343.00	11.93	0.80	(on or before) June 2010
S19	Continuous Hot Dip Galvanizing Line #1 - Annealing Furnace	**1.83E-01**	**1.03E-01**	**8.32E-01**	**8.32E-03**	**8.32E-01**	405513.02	3446163.85	44.99	573.00	17.45	1.45	(on or before) June 2010
S20	Continuous Hot Dip Galvanizing Line #2 - Annealing Furnace and Water Heater	**2.36E-01**	**1.37E-01**	**1.01E+00**	**1.05E-02**	**1.00E+00**	405415.29	3446264.45	44.81	500.22	16.34	1.25	(on or before) June 2010
S21	Continuous Hot Dip Galvanizing Line #3 - Annealing Furnace	**1.83E-01**	**1.03E-01**	**8.32E-01**	**8.32E-03**	**8.32E-01**	405552.25	3446123.34	44.99	573.00	17.45	1.45	(on or before) June 2010

[9] The fraction of filterable PM_{10} which is $PM_{2.5}$ has been conservatively revised to 60% based on testing performed February 14-15, 2019. The testing results are included in Appendix C.

Table C-1: Non-Affected AM/NS Sources (cont'd)		Potential to Emit					Location & Stack Parameters						Date Operation Began
Source ID	Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	CO (g/s)	SO_2 (g/s)	NOx (g/s)	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	
S22	Continuous Hot Dip Galvanizing Line #4 - Annealing Furnace with SCR	**2.03E-01**	**1.18E-01**	**9.07E-01**	**9.07E-03**	**9.07E-01**	405428.25	3446198.55	45.70	565.93	29.20	1.25	(on or before) June 2010
S27	Continuous Hot Dip Galvanizing Line #1 - Skin Pass Mill + Dryer with Mist Eliminator	**7.69E-02**	**7.56E-02**	**1.42E-02**	**1.42E-04**	**1.42E-02**	405416.11	3446068.87	44.00	323.00	11.67	1.01	(on or before) June 2010
S28	Continuous Hot Dip Galvanizing Line #2 - Skin Pass Mill + Dryer with Mist Eliminator	**7.63E-02**	**7.51E-02**	**1.42E-02**	**1.42E-04**	**1.42E-02**	405318.37	3446169.48	43.99	323.00	11.67	1.01	(on or before) June 2010
S29	Continuous Hot Dip Galvanizing Line #3 - Skin Pass Mill + Dryer with Mist Eliminator	**7.69E-02**	**7.56E-02**	**1.42E-02**	**1.42E-04**	**1.42E-02**	405454.39	3446029.38	44.00	323.00	11.67	1.01	(on or before) June 2010
S30	Continuous Hot Dip Galvanizing Line #4 - Skin Pass Mill with Mist Eliminator	**8.08E-02**	**7.95E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405356.78	3446129.98	43.99	303.15	10.29	1.01	(on or before) June 2010
S31	Continuous Hot Dip Galvanizing Line #1 - Post Treatment Dryer	**1.38E-02**	**8.66E-03**	**5.80E-02**	**5.80E-04**	**5.80E-02**	405388.66	3446042.47	44.00	343.00	14.84	0.50	(on or before) June 2010
S33	Continuous Hot Dip Galvanizing Line #3 - Post Treatment Dryer	**1.38E-02**	**8.66E-03**	**5.80E-02**	**5.80E-04**	**5.80E-02**	405427.09	3446002.95	44.00	343.00	14.84	0.50	(on or before) June 2010
S34	Continuous Hot Dip Galvanizing Line #4 - Line 4 Dryer and Post-Treatment Dryer	**1.81E-02**	**1.04E-02**	**8.19E-02**	**8.19E-04**	**8.19E-02**	405329.44	3446103.49	44.00	343.15	20.54	0.50	(on or before) June 2010
S36	Skin Pass Mill with Mist Eliminator	**1.52E-01**	**1.50E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405283.37	3445982.39	26.50	303.15	20.11	1.00	(on or before) June 2010
S37	Boiler #1	**1.16E-01**	**6.57E-02**	**3.53E-01**	**5.29E-03**	**3.09E-01**	405757.14	3446607.46	15.26	420.93	16.91	0.91	(on or before) June 2010
S38	Boiler #2	**1.16E-01**	**6.57E-02**	**3.53E-01**	**5.29E-03**	**3.09E-01**	405750.67	3446614.23	15.26	420.93	16.91	0.91	(on or before) June 2010
S39	Boiler #3	**1.16E-01**	**6.57E-02**	**3.53E-01**	**5.29E-03**	**3.09E-01**	405744.12	3446620.95	15.26	420.93	16.91	0.91	(on or before) June 2010
S59	Spray Roaster Baghouse	**5.18E-02**	**5.01E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	405680.17	3446611.15	30.48	358.15	19.69	0.36	After October 2010
S60	Spray Roaster Scrubber	**2.33E-01**	**2.31E-01**	**5.03E-01**	**3.60E-03**	**5.77E-01**	405675.69	3446628.31	45.72	358.15	21.43	1.01	After October 2010
BV1 (short-term)	Batch Annealing Furnace (Building Vent 1)	**5.77E-02**	**3.30E-02**	**3.65E-01**	**2.52E-03**	**4.32E-01**	405696.97	3446438.86	25.15	309.82	35.09	5.08	After October 2010
BV2 (short-term)	Batch Annealing Furnace (Building Vent 2)	**5.77E-02**	**3.30E-02**	**3.65E-01**	**2.52E-03**	**4.32E-01**	405675.33	3446416.93	25.15	309.82	35.09	5.08	After October 2010
BV1 (annual)	Batch Annealing Furnace (Building Vent 1)	**1.91E-02**	**1.09E-02**	**1.21E-01**	**8.63E-04**	**1.43E-01**	405696.97	3446438.86	25.15	309.82	35.09	5.08	After October 2010
BV2 (annual)	Batch Annealing Furnace (Building Vent 2)	**1.91E-02**	**1.09E-02**	**1.21E-01**	**8.63E-04**	**1.43E-01**	405675.33	3446416.93	25.15	309.82	35.09	5.08	After October 2010

Table C-2: Emergency Engines (Short term averaging)		Potential to Emit					Location & Stack Parameters						Date Operation Began
Source ID	Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	CO (g/s)	SO_2 (g/s)	NOx (g/s)	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	
S42	CWC Generator	**1.69E-02**	**1.69E-02**	**2.89E-01**	**5.29E-04**	**3.30E-01**	406453.03	3446888.17	2.41	772.65	112.54	0.10	(on or before) June 2010
S43	Generator - Electrical Room 2-1	**6.37E-02**	**6.37E-02**	**1.09E+00**	**2.00E-03**	**1.99E+00**	406415.71	3447042.48	11.28	774.25	44.24	0.30	(on or before) June 2010
S44	Generator - Electrical Room 2-2	**6.37E-02**	**6.37E-02**	**1.09E+00**	**2.00E-03**	**1.99E+00**	406407.58	3447034.66	11.28	774.25	44.24	0.30	(on or before) June 2010
S45	Generator - Electrical Room 2-3	**6.37E-02**	**6.37E-02**	**1.09E+00**	**2.00E-03**	**1.99E+00**	406399.75	3447024.88	11.28	774.25	44.24	0.30	(on or before) June 2010
S46	Generator - Electrical Room 4	**6.37E-02**	**6.37E-02**	**1.09E+00**	**2.00E-03**	**1.99E+00**	406187.44	3446826.83	6.71	774.25	44.24	0.30	(on or before) June 2010
S47	Primary Diesel Pump 1	**3.04E-02**	**3.04E-02**	**5.20E-01**	**9.54E-04**	**5.94E-01**	406553.97	3447046.79	2.74	787.55	111.28	0.15	(on or before) June 2010
S48	Primary Diesel Pump 2	**3.04E-02**	**3.04E-02**	**5.20E-01**	**9.54E-04**	**5.94E-01**	406561.49	3447042.12	2.74	787.55	111.28	0.15	(on or before) June 2010
S49	Primary Diesel Pump 3	**3.04E-02**	**3.04E-02**	**5.20E-01**	**9.54E-04**	**5.94E-01**	406567.35	3447036.25	2.74	787.55	111.28	0.15	(on or before) June 2010
S50	Secondary Diesel Pump 1	**9.54E-03**	**9.54E-03**	**1.63E-01**	**2.99E-04**	**1.86E-01**	406582.71	3447019.09	2.74	719.15	6.85	0.15	(on or before) June 2010
S51	Secondary Diesel Pump 2	**9.54E-03**	**9.54E-03**	**1.63E-01**	**2.99E-04**	**1.86E-01**	406588.57	3447011.27	2.74	719.15	6.85	0.15	(on or before) June 2010
S52	Secondary Diesel Pump 3	**9.54E-03**	**9.54E-03**	**1.63E-01**	**2.99E-04**	**1.86E-01**	406596.40	3447001.49	2.74	719.15	6.85	0.15	(on or before) June 2010
S53	Diesel Generator - Line 3	**6.37E-02**	**6.37E-02**	**1.09E+00**	**2.00E-03**	**1.99E+00**	405555.73	3446230.60	3.66	774.25	63.71	0.25	(on or before) June 2010
S54	Diesel Generator - Line 4	**6.37E-02**	**6.37E-02**	**1.09E+00**	**2.00E-03**	**1.99E+00**	405502.49	3446280.29	3.66	774.25	63.71	0.25	(on or before) June 2010
S55	Building 901 Emergency Generator	**2.26E-02**	**2.26E-02**	**3.86E-01**	**7.08E-04**	**4.41E-01**	405449.26	3446500.32	2.44	766.05	102.65	0.14	(on or before) June 2010
S56	Permanent Data Center Generator	**4.55E-02**	**4.55E-02**	**7.78E-01**	**1.43E-03**	**1.42E+00**	405474.10	3446826.83	3.81	783.05	146.10	0.15	(on or before) June 2010
S57	Temporary Data Center Generator	**1.71E-02**	**1.71E-02**	**2.92E-01**	**5.36E-04**	**3.34E-01**	405094.37	3446535.81	2.54	773.15	66.32	0.15	(on or before) June 2010
S58A	Dispatch Center Generator - Stack 1	**1.71E-02**	**1.71E-02**	**2.92E-01**	**5.35E-04**	**5.34E-01**	405101.98	3446541.98	3.35	834.15	63.23	0.15	(on or before) June 2010

Table C-2: Emergency Engines (Short-term averaging); cont'd		Potential to Emit					Location & Stack Parameters						Date Operation Began
Source ID	Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	CO (g/s)	SO_2 (g/s)	NOx (g/s)	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	
S58B	Dispatch Center Generator - Stack 2	**1.71E-02**	**1.71E-02**	**2.92E-01**	**5.35E-04**	**5.34E-01**	404789.16	3445950.24	3.35	834.15	63.23	0.15	(on or before) June 2010
SXX-1	Fueling Station Generator	**3.05E-03**	**3.05E-03**	**5.47E-02**	**6.39E-05**	**7.46E-02**	405140.50	3445414.35	2.29	868.15	39.14	0.07	After October 2010
SXX-2	Cold Roll Mill Generator	**1.62E-03**	**1.62E-03**	**4.25E+00**	**1.13E-04**	**5.57E-02**	405910.62	3446539.36	0.15	1,189.15	2.23	0.20	After October 2010
SXX-3	HSM Furnace Generator	**4.61E-03**	**4.61E-03**	**2.99E-01**	**1.40E-04**	**1.50E-01**	406440.98	3447095.42	1.83	1,189.15	66.81	0.10	After October 2010
Pump House EGEN 1	Pump House EGEN 1	**2.30E-02**	**2.30E-02**	**3.93E-01**	**7.21E-04**	**4.49E-01**	406766.95	3446763.59	4.57	761.15	99.48	0.15	(on or before) June 2010
Pump House EGEN 2	Pump House EGEN 2	**2.30E-02**	**2.30E-02**	**3.93E-01**	**7.21E-04**	**4.49E-01**	406773.59	3446768.98	4.57	761.15	99.48	0.15	(on or before) June 2010
S4 EGEN Pump	S4 EGEN Pump	**2.01E-02**	**2.01E-02**	**3.44E-01**	**6.32E-04**	**3.94E-01**	405360.54	3446564.20	2.44	766.05	86.25	0.15	(on or before) June 2010
Electrical Substation EGEN	Electrical Substation EGEN	**2.54E-03**	**2.54E-03**	**1.01E+01**	**7.71E-05**	**2.61E-01**	406247.36	3446476.20	1.32	1,189.15	124.19	0.05	After October 2010
NG Generac Controls FWP	NG Generac Controls FWP	**3.03E-03**	**3.03E-03**	**1.49E-01**	**9.17E-05**	**7.45E-02**	406777.74	3446769.19	2.13	788.71	206.77	0.05	(on or before) June 2010

Table C-3: Emergency Engines (Annual Averaging)		Potential to Emit					Location & Stack Parameters						Date Operation Began
Source ID	Description	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	CO (g/s)	SO_2 (g/s)	NOx (g/s)	UTM East (m)	UTM North (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	
S42	CWC Generator	**1.93E-04**	**1.93E-04**	**3.29E-03**	**6.04E-06**	**3.76E-03**	406453.033	3446888.174	2.41	772.65	112.54	0.10	(on or before) June 2010
S43	Generator - Electrical Room 2-1	**7.27E-04**	**7.27E-04**	**1.24E-02**	**2.28E-05**	**2.27E-02**	406415.713	3447042.476	11.28	774.25	44.24	0.30	(on or before) June 2010
S44	Generator - Electrical Room 2-2	**7.27E-04**	**7.27E-04**	**1.24E-02**	**2.28E-05**	**2.27E-02**	406407.577	3447034.656	11.28	774.25	44.24	0.30	(on or before) June 2010
S45	Generator - Electrical Room 2-3	**7.27E-04**	**7.27E-04**	**1.24E-02**	**2.28E-05**	**2.27E-02**	406399.747	3447024.876	11.28	774.25	44.24	0.30	(on or before) June 2010
S46	Generator - Electrical Room 4	**7.27E-04**	**7.27E-04**	**1.24E-02**	**2.28E-05**	**2.27E-02**	406187.44	3446826.83	6.71	774.25	44.24	0.30	(on or before) June 2010
S47	Primary Diesel Pump 1	**3.47E-04**	**3.47E-04**	**5.93E-03**	**1.09E-05**	**6.78E-03**	406553.973	3447046.794	2.74	787.55	111.28	0.15	(on or before) June 2010
S48	Primary Diesel Pump 2	**3.47E-04**	**3.47E-04**	**5.93E-03**	**1.09E-05**	**6.78E-03**	406561.488	3447042.12	2.74	787.55	111.28	0.15	(on or before) June 2010
S49	Primary Diesel Pump 3	**3.47E-04**	**3.47E-04**	**5.93E-03**	**1.09E-05**	**6.78E-03**	406567.348	3447036.25	2.74	787.55	111.28	0.15	(on or before) June 2010
S50	Secondary Diesel Pump 1	**1.09E-04**	**1.09E-04**	**1.86E-03**	**3.42E-06**	**2.13E-03**	406582.711	3447019.089	2.74	719.15	6.85	0.15	(on or before) June 2010
S51	Secondary Diesel Pump 2	**1.09E-04**	**1.09E-04**	**1.86E-03**	**3.42E-06**	**2.13E-03**	406588.571	3447011.269	2.74	719.15	6.85	0.15	(on or before) June 2010
S52	Secondary Diesel Pump 3	**1.09E-04**	**1.09E-04**	**1.86E-03**	**3.42E-06**	**2.13E-03**	406596.401	3447001.489	2.74	719.15	6.85	0.15	(on or before) June 2010
S53	Diesel Generator - Line 3	**7.27E-04**	**7.27E-04**	**1.24E-02**	**2.28E-05**	**2.27E-02**	405555.73	3446230.6	3.66	774.25	63.71	0.25	(on or before) June 2010
S54	Diesel Generator - Line 4	**7.27E-04**	**7.27E-04**	**1.24E-02**	**2.28E-05**	**2.27E-02**	405502.49	3446280.29	3.66	774.25	63.71	0.25	(on or before) June 2010
S55	Building 901 Emergency Generator	**2.57E-04**	**2.57E-04**	**4.40E-03**	**8.08E-06**	**5.03E-03**	405449.26	3446500.32	2.44	766.05	102.65	0.14	(on or before) June 2010
S56	Permanent Data Center Generator	**5.19E-04**	**5.19E-04**	**8.88E-03**	**1.63E-05**	**1.62E-02**	405474.1	3446826.83	3.81	783.05	146.10	0.15	(on or before) June 2010
S57	Temporary Data Center Generator	**1.95E-04**	**1.95E-04**	**3.34E-03**	**6.12E-06**	**3.81E-03**	405094.37	3446535.81	2.54	773.15	66.32	0.15	(on or before) June 2010
S58A	Dispatch Center Generator - Stack 1	**1.95E-04**	**1.95E-04**	**3.33E-03**	**6.11E-06**	**6.09E-03**	405101.98	3446541.98	3.35	834.15	63.23	0.15	(on or before) June 2010
S58B	Dispatch Center Generator - Stack 2	**1.95E-04**	**1.95E-04**	**3.33E-03**	**6.11E-06**	**6.09E-03**	404789.16	3445950.24	3.35	834.15	63.23	0.15	(on or before) June 2010

Table C-3: Emergency Engines (Annual Averaging), cont'd		Potential to Emit					Location & Stack Parameters						Date Operation Began
Source ID	**Description**	**PM_{10} (g/s)**	**$PM_{2.5}$ (g/s)**	**CO (g/s)**	**SO_2 (g/s)**	**NOx (g/s)**	**UTM East (m)**	**UTM North (m)**	**Stack Height (m)**	**Stack Temperature (K)**	**Stack Velocity (m/s)**	**Stack Diameter (m)**	
SXX-1	Fueling Station Generator	**3.48E-05**	**3.48E-05**	**6.24E-04**	**7.29E-07**	**8.51E-04**	405140.5	3445414.35	2.29	868.15	39.14	0.07	After October 2010
SXX-2	Cold Roll Mill Generator	**1.85E-05**	**1.85E-05**	**4.85E-02**	**1.29E-06**	**6.36E-04**	405910.62	3446539.36	0.15	1,189.15	2.23	0.20	After October 2010
SXX-3	HSM Furnace Generator	**5.26E-05**	**5.26E-05**	**3.41E-03**	**1.59E-06**	**1.71E-03**	406440.98	3447095.42	1.83	1,189.15	66.81	0.10	After October 2010
Pump House EGEN 1	Pump House EGEN 1	**2.62E-04**	**2.62E-04**	**4.49E-03**	**8.23E-06**	**5.13E-03**	406766.95	3446763.59	4.57	761.15	99.48	0.15	(on or before) June 2010
Pump House EGEN 2	Pump House EGEN 2	**2.62E-04**	**2.62E-04**	**4.49E-03**	**8.23E-06**	**5.13E-03**	406773.59	3446768.98	4.57	761.15	99.48	0.15	(on or before) June 2010
S4 EGEN Pump	S4 EGEN Pump	**2.30E-04**	**2.30E-04**	**3.93E-03**	**7.21E-06**	**4.49E-03**	405360.54	3446564.2	2.44	766.05	86.25	0.15	(on or before) June 2010
Electrical Substation EGEN	Electrical Substation EGEN	**2.90E-05**	**2.90E-05**	**1.15E-01**	**8.80E-07**	**2.97E-03**	406247.36	3446476.2	1.32	1,189.15	124.19	0.05	After October 2010
NG Generac Controls FWP	NG Generac Controls FWP	**3.45E-05**	**3.45E-05**	**1.70E-03**	**1.05E-06**	**8.50E-04**	406777.74	3446769.19	2.13	788.71	206.77	0.05	(on or before) June 2010

APPENDIX D S6 AND S7 TESTING RESULTS

TABLE 1-1
TEST RESULTS SUMMARY
CPL (S6) STACK
PM_{10} AND $PM_{2.5}$

Run Number	1	2
Date:	2/14/2019	2/14/2019
Time:	15:15-16:08	16:45-17:40
Flue Gas:		
Temperature, °F	75.8	78.0
Moisture Content, %	2.68	1.73
Velocity, ft/s	60.08	60.40
Volumetric Flow Rate, acfm	51,135	51,409
Volumetric Flow Rate, dscfm	49,476	50,018
$PM_{2.5}$ Emissions:		
gr/dscf	8.8026E-04	6.2400E-04
lb/hr	0.3733	0.2675
PM_{10} Emissions:		
gr/dscf	1.6805E-03	1.3260E-03
lb/hr	0.7127	0.5685
CPM Emissions:		
gr/dscf	0.00204	0.00347
lb/hr	0.8654	1.4881
TPM Emissions:		
gr/dscf	0.00452	0.00542
lb/hr	1.9174	2.3242

TABLE 1-2
TEST RESULTS SUMMARY
CPL (S6) STACK
PM

Run Number	1	2	Permit Limits
Date:	2/14/2019	2/14/2019	
Time:	11:09-12:00	12:44-13:36	
Flue Gas:			
Temperature, °F	72.2	75.6	
Moisture Content, %	1.52	2.08	
Velocity, ft/s	60.32	59.75	
Volumetric Flow Rate, acfm	51,339	50,856	
Volumetric Flow Rate, dscfm	50,532	49,456	
PM Emissions:			
gr/dscf	0.0007	0.0007	**0.005**
lb/hr	0.2936	0.2988	**2.185**

TABLE 1-3
TEST RESULTS SUMMARY
PLTCM (S7) STACK
PM_{10} AND $PM_{2.5}$

Run Number	**1**
Date:	2/15/2019
Time:	14:35-15:23
Flue Gas:	
Temperature, °F	71.5
Moisture Content, %	1.74
Velocity, ft/s	69.10
Volumetric Flow Rate, acfm	58,813
Volumetric Flow Rate, dscfm	56,816
$PM_{2.5}$ Emissions:	
gr/dscf	8.0423E-04
lb/hr	0.3917
PM_{10} Emissions:	
gr/dscf	1.5280E-03
lb/hr	0.7441
CPM Emissions	
gr/dscf	.00185
lb/hr	.9008
TPM Emissions	
gr/dscf	.00442
lb/hr	2.1541

**TABLE 1-4
TEST RESULTS SUMMARY
PLTCM (S7) STACK
PM**

Run Number	1	2	Permit Limits
Date:	2/15/2019	2/15/2019	
Time:	11:19-12:08	12:40-13:30	
Flue Gas:			
Temperature, °F	77.6	79.0	
Moisture Content, %	1.99	2.23	
Velocity, ft/s	68.35	69.06	
Volumetric Flow Rate, acfm	58,178	58,783	
Volumetric Flow Rate, dscfm	56,368	58,666	
PM Emissions:			
gr/dscf	0.0022	0.0016	**0.005**
lb/hr	1.0729	0.7535	**2.185**

APPENDIX H CLASS I AQRV MODELING REPORT

December 2020

Class I Air Quality Related Values Analysis Modeling Report

AM/NS Calvert, LLC
Calvert, Alabama

December 2020

Project No.: 0536883

The business of sustainability

ERM

Signature Page

December 2020

Class I Air Quality Related Values Analysis Modeling Report

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Acronyms and Abbreviations

Name	Description
ºF	degrees Fahrenheit
ADEM	Alabama Department of Environmental Management
AQRV	air quality related value
BART	best available retrofit technology
C.F.R.	Code of Federal Regulations
CALPOST	CALPUFF post processing package
CALPUFF	an advanced air quality dispersion modeling system
DAT	deposition assessment threshold
ERM	Environmental Resources Management
EPA	United States Environmental Protection Agency
FLAG	Federal Land Manager's Air Quality Related Values Work Group
FLM	Federal Land Manager
HNO_3	nitric acid
kg/ha/yr	kilograms per hectare per year
km	kilometer
m^3	cubic meter
MESOPUFF II	a Lagrangian variable-trajectory puff- superposition air dispersion modeling system
MW	megawatt or molecular weight
NH_4	ammonium ion
$(NH_4)_2SO_4$	ammonium sulfate
NH_4NO_3	ammonium nitrate
NO_2	nitrogen dioxide
NO_3	nitrate
NO_X	nitrogen oxides
NPS	National Park Service
NWR	National Wildlife Refuge
NWS	National Weather Service
PLUVUE-II	a plume estimation air dispersion modeling system
PM	particulate matter
PM_{10}	particulate matter equal to or less than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in aerodynamic diameter
PMC	coarse particulate matter (particulate matter between 2.5 and 10 microns in aerodynamic diameter)
POSTUTIL	CALPUFF post processing package
PSD	Prevention of Significant Deterioration

PTE	potential to emit
Q/d	initial annual emissions over distance screening criteria
SIL	Significant Impact Level
SMR	single mixed refrigerant
SO_2	sulfur dioxide
SO_4	sulfate
SOA	secondary organic aerosol
SOIL	inorganic fine particulate (<2.5 microns in diameter)
VISTAS	Visibility Improvement State and Tribal Association of the Southeast

1. INTRODUCTION

AM/NS Calvert, L.L.C. (AM/NS) 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 February 24, 2015 (Permit Number 503-0095).

AM/NS is submitting this application to request authorization for construction of two (2) melt shops to reduce reliance on third party raw material providers. Each melt shop will consist of:

- One (1) Electric Arc Furnaces (EAF);
- One (1) twin Ladle Metallurgy Furnace (LMF);
- One (1) Degassing operation controlled by flare; and
- One (1) Continuous Caster with spray vent, ladle/tundish preheating activities, and associated support equipment.

Each melt shop will be controlled by one (1) new baghouse for control of emissions. In addition to the melt shops, the project will include installation of auxiliary equipment including one (1) new contact cooling tower, scrap and raw material handling operations, material storage silos, and a scarfing operation for slabs.

The construction of the melt shops is proposed to be conducted in phases. Phase 1 will include the installation of the first melt shop and the associated auxiliary equipment and Phase 2 will include the installation of the second melt shop and its associated auxiliary equipment. The emission sources and potential emissions from both phases are included in this permit application.

This Class I Air Quality Related Values (AQRV) modeling report is provided in support of the permit application. The modeling report is organized as follows:

- Section 1.1 – Facility Description;
- Section 1.2 – Description of Proposed Changes;
- Section 1.3 – Regulatory Drivers and Modeling Applicability;
- Section 2.1 – Model Selection;
- Section 2.2 – Modeled Stack Parameters;
- Section 2.3 – Particulate Emissions Speciation for CALPUFF;
- Section 2.4 – Modeling Domains;
- Section 2.5 – Receptor Locations;
- Section 2.6 – CALPUFF Model Processing;
- Section 2.7 – CALPOST Post Processing Analysis;
- Section 3 – Class I Visibility Modeling Analysis Approach;

- Section 4 – Class I Deposition Modeling Analysis Approach;
- Section 5 – Class I Visibility and Deposition Results.

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 (e.g., coils, slits, sheets, blanks) 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.

The raw materials in the production of steel strip are steel slabs that are currently barged to the facility from Brazil or received from other locations or suppliers. Steel slabs are heated and rolled to form a flat strip in the Hot Strip Mill (HSM). From the HSM, the coils (flat strips) are prepared for sales or proceed to the pickling lines. After pickling, if needed, the strips may be cold-rolled to customer specifications and then sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

1.2 Description of Proposed Changes

With this application, AM/NS proposes to construct two melt shops which will allow AM/NS to produce the steel slabs which are currently imported.

The new equipment part of the proposed project will consist of the new melt shops and auxiliary sources where steel scrap and other alternative iron units will be charged and melted in an EAF. Steel scrap and other alternative iron units will be placed into the EAF where they will be charged and then melted. The resulting molten steel will be poured out of the EAF via tapping operations into a ladle which will then transfer the molten steel to a continuous caster where slabs will be formed. The slabs will leave the melt shop and be processed in the HSM and if needed may be cold-rolled after the HSM to customer specifications and then either sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

AM/NS is proposing to install two new melt shops in two phases. The proposed melt shop project will consist of the following new emission sources:

- Two (2) Electric Arc Furnaces (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations) and associated baghouses;
- One (1) Contact Cooling Tower for Casting (Cooling Tower will be sized for casting from both EAFs);
- Two (2) Caster Steam Exhausts (Direct contact cooling water for Casting);
- Slag Handling Operations;
- Storage Piles (scrap and raw material handling operations) and Material Transfer;
- Two (2) Degassing Operations controlled by Flares (1 Vacuum Tank Degassing (VTD) Flare and 1 Ruhrstahl-Heraeus (RH) Flare);
- 24 silos for the storage of alloys;
- Ten (10) silos for the storage of lime, dolomite and bauxite;
- Eight (8) silos for the storage of direct reduced iron (DRI);
- Five (5) silos for the storage of flux injection materials;
- Four (4) silos for the storage of hot briquetted iron (HBI);

- Two (2) baghouse dust silos (BH);
- Scarfing Operations and associated electrostatic precipitator (ESP); and
- Road Dust from truck traffic

1.3 Regulatory Drivers and Modeling Applicability

Under the Clean Air Act, the federal land manager (FLM) and the federal official with direct responsibility for management of federal Class I areas have an affirmative responsibility to protect the AQRV of such lands and to consider whether a proposed major emitting facility may have an adverse impact on such values.[1] To provide better consistency in review of new source permit applications near federal Class I areas, the FLMs formed the Federal Land Manager's Air Quality Related Values Work Group (FLAG).

Air quality impacts on federally protected Class I areas must be assessed for projects meeting the criteria discussed in the FLM's FLAG Phase I Report–Revised (2010)[2] (herein, the "2010 FLAG Report") as described below:

> *Generally, the permitting authority should notify the FLM of all new or modified major facilities proposing to locate within 100 km (62 miles) of a Class I area. In addition, the permitting authority should notify the FLM of "very large sources" with the potential to affect Class I areas proposing to locate at distances greater than 100 km. (Reference March 19, 1979, memorandum from U.S. EPA Assistant Administrator for Air, Noise, and Radiation to Regional Administrators, Regions I-X). Given the multitude of possible size/distance combinations, the FLMs cannot precisely define in advance what constitutes a "very large source" located more than 100 km away that may impact a particular Class I area. However, as discussed elsewhere in this report, the Agencies have adopted a size (Q)/distance (D) criteria to screen out from AQRV review those sources with relatively small amounts of emissions located a large distance from a Class I area. Consequently, as a minimum, the permitting authority should notify the FLM of all sources that exceed these Q/D criteria.*

As set forth by the FLM, the Q/D analysis compares the ratio of the sum of proposed annualized maximum daily emission rates of all visibility impairing pollutants (in tons per year) and the distance to the nearest Class I area (in km) to a threshold value of 10.[3] The Class I area of interest for the Project is the Breton NWR, located at approximately 130 km from the Project Site, as summarized in Table 1-1.[4] The Sipsey Wilderness Area in Alabama was also analyzed, as it is the next closest Class I area to the Project Site. As shown in Table 1-2 and Appendix A, the Q/D analysis for this Class I area demonstrates that the threshold value of 10 is exceeded for Breton NWR but not for Sipsey Wilderness Area; therefore, a Class I area AQRV impact analysis will only be required for Breton NWR. AM/NS has

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1 U.S. Environmental Protection Agency. Notification to Federal Land Manager Under Section 165(d) of the Clean Air Act. Correspondence dated March 19, 1979. https://www.epa.gov/sites/production/files/2015-07/documents/fdlndmgr.pdf. Accessed June 2017.

2 National Park Service. Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report–Revised (2010). https://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG_2010.pdf. Accessed June 2017.

3 Per the 2010 FLAG Report, pp.18-19: "The Agencies will consider a source locating greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRVs if its total SO_2, NO_X, PM_{10}, and H_2SO_4 annual emissions (in tons per year, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less."

4 The distance from each federal Class I area has been calculated based on location information provided by Plaquemines LNG and Gator Express Pipeline.

communicated this information with the Sipsey Wilderness Area US Forest Service FLM to verify no Class I demonstration is needed.

Table 1-1 Location of the Project Relative to Class I Areas

Class I Area, State	Distance from Terminal Site to Class I Area (km)	Direction from Project Site to Class I Area	Federal Land Manager
Breton National Wildlife Refuge, LA (Breton NWR), LA	130.0	Southwest	U.S. Fish & Wildlife Service (FWS)
Sipsey Wilderness Area, AL	351.1	Northeast	U.S. Department of Agriculture Forest Service (USDA/FS)

Per the 2010 FLAG Report, the Q/D analysis must compare the ratio of the annualized 24-hour maximum allowable emissions of all visibility-impairing pollutants (in tons per year) and the distance to the nearest Federal Class I area (in km) to a threshold value of 10.[5] Table 1-2 shows the Q value calculated by the project emissions, the distance D used in the calculation, and the results of the Q/D calculation. The distance D is determined based on minimal distance between the middle point of the two Electric Arc Furnace stacks and the receptors in both Class I areas. The Q/D calculations are included in Appendix A.

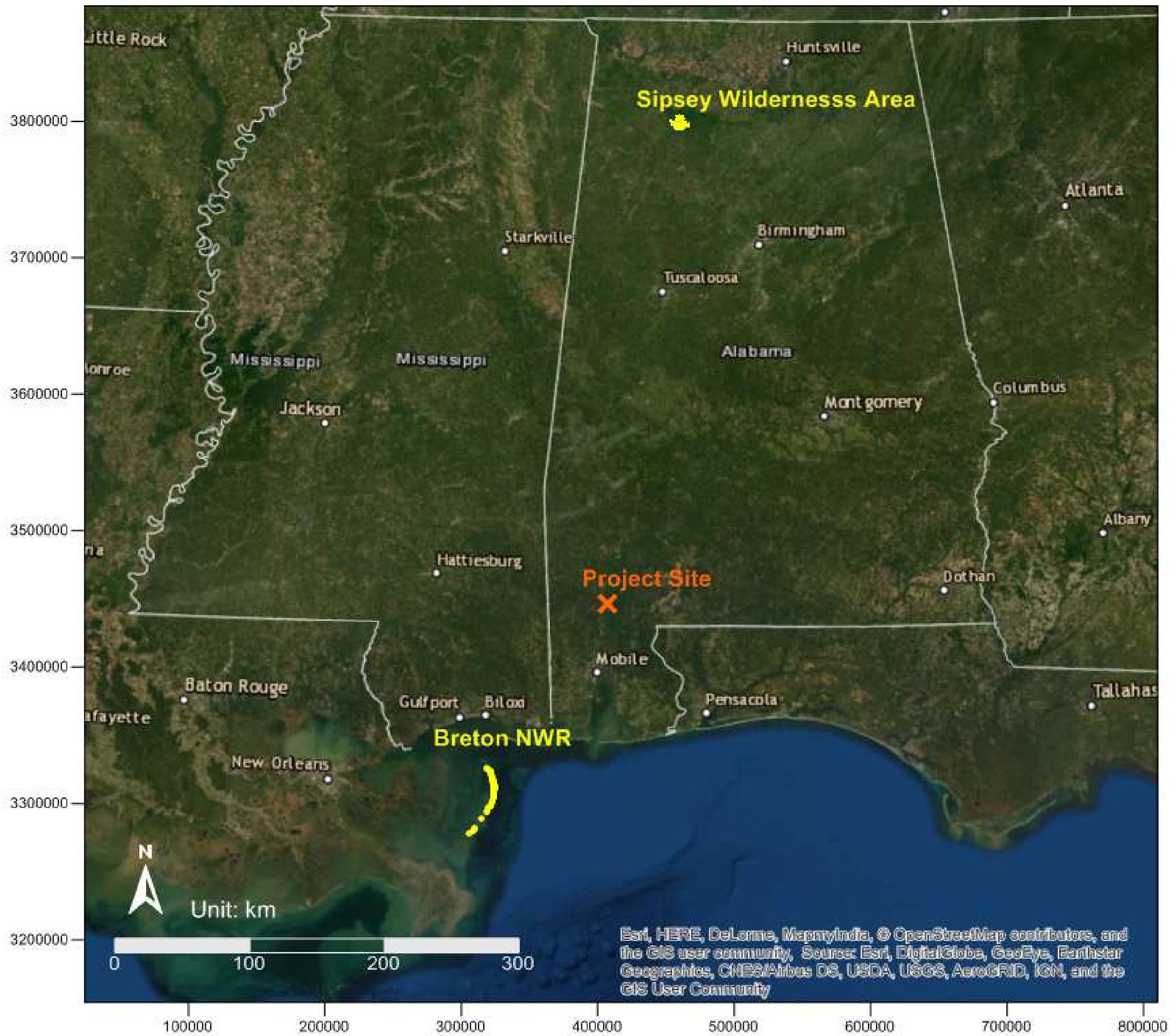
Table 1-2 Q/D Calculation for the Base Case AQRV Emissions Scenario

Class I Area, State	Emissions (Q) (tpy)	Distance (D) (km)	Q/D (tpy/km)
Breton National Wildlife Refuge, LA	2,712	130.0	20.9
Sipsey Wilderness Area, AL	2,712	351.1	7.7

A map showing the location of the Project relative to Breton NWR, the Sipsey Wilderness Area and surrounding onshore areas is provided in Figure 1-1.

5 2010 FLAG Report, p. 18.

Figure 1-1 Project Location and Class I Areas Map



2. MODELING ANALYSIS AND PROCEDURES

2.1 Model Selection

The 2010 FLAG Report specifies the use of the CALPUFF modeling system for AQRV analyses in Class I areas at distances greater than 50 km from the source under review. The previously approved EPA version (Version 5.8.5) of the CALPUFF model was used to assess the impacts of the Project's air emissions on AQRVs at Breton NWR.

CALPUFF is a multi-layer, multi-species, non-steady-state Lagrangian puff model, which can simulate the effects of time and space-varying meteorological conditions on pollutant transport, transformation, and removal. For this analysis, meteorological fields generated by CALMET were used as inputs to the CALPUFF model. Specifically, 4-km resolution CALMET data prepared for the Visibility Improvement State and Tribal Association of the Southeast[6] (VISTAS) for the period 2001-2003 were be used. Although the recently updated Guideline on Air Quality Models (Appendix W) no longer lists CALPUFF as a preferred model for long range transport, U.S. EPA does note in Sections 4.2 (c)(ii) and 4.2.1 (e) that Lagrangian dispersion models are appropriate for long range transport and that a Lagrangian model used for this purpose (Class I AQRV assessment) does not have to be approved as an alternative model. This report provides the methodologies that were used to utilize CALPUFF for the long range transport assessment related to Class I AQRVs. AM/NS asserts that the methodologies described in this report conform to best practices in that all recommendations in the 2010 FLAG Report are adhered to for the assessment of AQRVs. AM/NS also asserts that the use of meteorological data from VISTAS (that have an established record of acceptance for use in best available retrofit technology (BART) assessments and PSD air quality modeling analyses for Class I areas across the southeastern US by FLMs) is a best practice for this analysis and should be readily approvable by reviewing authorities in this case.

CALPUFF uses several other input files to specify source and receptor parameters. The selection and control of CALPUFF options are determined by user-specific inputs contained in the control file. This file contains all of the necessary information to define a model run (e.g., starting date, run length, grid specifications, technical options, output options). The air quality modeling that was performed using CALPUFF utilized default options unless otherwise noted, as specified in Appendix W, the 2010 FLAG Report, and the Interagency Workgroup on Air Quality Modeling (IWAQM) documents.[7] The following sections describe the modeling domain, meteorological data, background concentrations, and model implementation that was used for the analysis of the Project.

2.2 Modeled Stack Parameters

The stack parameters for emissions sources are based either on a pre-construction plot plan of the AM/NS facility or information provided by the engineering firms. The same stack parameters were used for all modeling runs (AQRV, and sensitivity runs), and a summary of the stack parameters used in the modeling analysis is presented in Appendix B.

2.3 Particulate Emissions Speciation For CALPUFF

Modeling of visibility impairment due to particulate matter emissions requires that the components of the exhaust stream be speciated because different sizes and phases of particulate matter affect visibility to varying extents. The amount by which a mass of a certain species scatters or absorbs light is termed the

6 U.S. Environmental Protection Agency, "Visibility – Regional Planning Organizations". https://www.epa.gov/visibility/visibility-regional-planning-organizations. Accessed June 2017.

7 U.S. Environmental Protection Agency, "Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts". December 1998. https://www3.epa.gov/scram001/7thconf/calpuff/phase2.pdf. Accessed June 2017.

extinction efficiency or extinction coefficient, and varies considerably from coarse particulate matter to elemental carbon. Fine particulate matter and organic aerosols scatter light with intermediate efficiencies, and ammonium sulfate and ammonium nitrate (that form from precursor SO_2 and NO_X emissions in the presence of ambient ammonia) are hygroscopic species that scatter light efficiently in the presence of ambient water vapor. The particle size speciation used for all modeled source categories is presented in Table 2-1.

Table 2-1 Geometric Dimensions for PM Species

Species	Cumulative Mass Percent	Mass Fraction	Cumulative Mass Percent Corrected for PM10 [6]	Mass Fraction Corrected for PM10 [6]	Geometric Mass Mean Diameter (microns)
Electric Arc Furnace Melting[1]					
PM0050	74	74	97.4	97.4	0.5
PM0100	74	0	97.4	0.0	1
PM0250	74	0	97.4	0.0	2.5
PM0500	74	0	97.4	0.0	5
PM0600	74	0	97.4	0.0	6
PM1000	76	2	100	2.6	10
Cooling Tower[2]					
PM0050	0	0.0	0.0	0.0	0.5
PM0100	0	0.0	0.0	0.0	1
PM0250	0.21	0.2	0.3	0.3	2.5
PM0500	0.21	0.0	0.3	0.0	5
PM0600	0.21	0.0	0.3	0.0	6
PM1000	63.5	63.3	100	99.7	10
Mechanically Generated PM[3]					
PM0050	0	0	0.0	0.0	0.5
PM0100	4	4	7.8	7.8	1
PM0250	15	11	29.4	21.6	2.5
PM0500	30	15	58.8	29.4	5
PM0600	34	4	66.7	7.8	6
PM1000	51	17	100	33.3	10
Scarfing with ESP[4]					
PM0050	10	10	18.9	18.9	0.5
PM0100	21	11	39.6	20.8	1
PM0250	39	18	73.6	34.0	2.5
PM0500	47	8	88.7	15.1	5
PM0600	47	0	88.7	0.0	6
PM1000	53	6	100	11.3	10
Combustion[5]					
PM0050	0	0	0.0	0.0	0.5
PM0100	11	11	29.1	29.1	1
PM0250	29	18	57.0	27.8	2.5
PM0500	37	8	81.0	24.1	5
PM0600	37	0	88.6	7.6	6
PM1000	43	6	100	11.4	10

[1] Table 12.5-2, AP-42 Chapter 12.5: Iron and Steel Production (EAF)

[2] Calculting PM size distribution from Cooling Towers assuming 2,000 ppm TDS using the approach by Joel Reisman and Gordon Frisbie) https://www.energy.ca.gov/sitingcases//palomar/documents/applicants_files/Data_Request_Response/Air%20Quality/Attachment%204-1.pdf

[3] Category 3, AP-42 Appendix B.2 Generalized Particle Size Distributions.

[4] Table 12.5-2, AP-42 Chapter 12.5: Iron and Steel Production (Open Hearth Furnace controlled by ESP)

[5] Category 2, AP-42 Appendix B.2 Generalized Particle Size Distributions.

[6] Fraction corrected based on PM10.

The average particle diameter for each non-default speciated PM category were taken as the geometric mass mean diameter for that category. Geometric standard deviation was assumed to be zero. Default CALPUFF values for geometric mass mean diameter (0.48 microns) and geometric standard deviation (2.0 microns) were used for sulfate and nitrate particles.

The speciated PM emissions were calculated using the size speciation and the PM_{10} emissions. For the emissions from EAF sources, direct sulfate (SO_4) and nitrate (NO_3) have been calculated using the analysis results by Yang et al.(4.6% SO_4 and 5.6% NO_3) [8]. The amount of SO_4 and NO_3 were then subtracted from the speciated PM10 emissions from the EAF sources. Appendix C summarizes the detailed emissions for the model input.

The PM emissions were categorized into different light extinction species: coarse particulate (PMC, all particulate between 2.5 and 10 microns in diameter), Inorganic Fine Particulate (SOIL, inorganic particulate less than 2.5 microns in diameter), Secondary Organic Aerosol (SOA), and Elemental Carbon. Table 2-2 lists the proportion of each of these extinction species as a percentage of the particle size species.

8 His-Hsien yang et al., “Emission Characteristics and Chemical Compositions of both Filterable and Condensable Fine Particulate from Steel Plants”. Taiwan Association for Aerosol Research (http://aaqr.org/files/article/486/44_AAQR-15-06-OA-0398_1672-1680.pdf)

Table 2-2 Light Extinction Species

Species	PMC[1] (Extinction Coefficient: 0.6 Mm^{-1} per $\mu g/m^3$)	SOIL[2] (Extinction Coefficient: 1.0 Mm^{-1} per $\mu g/m^3$)	SOA[2] (Extinction Coefficient: 4 Mm^{-1} per $\mu g/m^3$)	EC[2] (Extinction Coefficient: 10 Mm^{-1} per $\mu g/m^3$)
PM0050	0.0%	34.4%	37.8%	27.8%
PM0100	0.0%	34.4%	37.8%	27.8%
PM0250	0.0%	34.4%	37.8%	27.8%
PM0500	100.0%	0.0%	0.0%	0.0%
PM0600	100.0%	0.0%	0.0%	0.0%
PM1000	100.0%	0.0%	0.0%	0.0%

[1] Assuming all PM larger than 2.5 mm contain 100% PMC.

[2] Assuming 25% EC in fine particles based on Particulate Matter Speciation (Gas-Fired Combustion Turbines) by National Park Service. https://nature.nps.gov/air/permits/ect/index.cfm. Accessed June 2017.
Total inorganic 41.1% (including 4.6% SO_4 and 5.6% NO_3 in fine particles, based on the research paper by Yang et al (http://aaqr.org/files/article/486/44_AAQR-15-06-OA-0398_1672-1680.pdf). The remaining 33.9% is assumed to be SOA. Since SO_4 and NO_3 are separate from PM in CALPUFF, SOIL, EC and SOA for fine particles are redistributed when SO_4 and NO_3 are excluded from PM. The PM speciation including and excluding SO4 and NO3 are summarized below.

PM speciation including SO4 and NO3		PM speciation excluding SO4 and NO3	
SOIL	30.9%	SOIL	34.4%
SO4	4.6%	SO4	0%
NO3	5.6%	NO3	0%
EC	25.0%	EC	27.8%
SOA	33.9%	SOA	37.8%
Total	100.0%	Total	100.0%

2.4 Modeling Domains

The Class I area modeling analysis has been performed in the Lambert Conformal Conic coordinate system based on the design of the VISTAS Regional Haze Rule[9] (RHR) modeling report, with standard parallels of 33º N and 45º N latitude, and reference latitude and longitude of 40º N and 97º W respectively. For CALPUFF to produce accurate results, the emissions sources and receptors must be located no less than 50 km from the domain edge. VISTAS RHR Model Domain 1 was utilized as the CALMET meteorological domain as the proposed emissions sources are located sufficiently within the model domain such that emitted puffs are not lost from the analysis. The different VISTAS RHR Model Domains are shown in Figure 2-1.

The horizontal domain is comprised of grid cells, each containing a central grid point at which meteorological and computational parameters are calculated at each time step. In Domain 1 of the VISTAS meteorological data, there are 116 X grid cells and 182 Y grid cells. The grid resolution is taken as 4 km. The computational domain is a subset of the CALMET meteorological domain. The X index of

[9] 40 C.F.R. Part 51, Subpart P. Regional Haze Regulations, 64 Fed. Reg. 35714 (July 1, 1999). https://www.gpo.gov/fdsys/pkg/FR-1999-07-01/pdf/99-13941.pdf. Accessed June 2017.

the lower left corner of the CALPUFF computational domain was set to 35, and the Y index of the lower left corner is 1. The X index of the upper right corner of the CALPUFF computational domain is 116 and the Y index of the upper right corner is 150. The computational domain was sized to ensure that the emissions sources and receptors are located more than 50 km from the domain edge while minimizing the model computational time.

Vertical grid structure is defined by the cell face height. The cell face height of each grid cell indicates its vertical extent. The vertical domain is composed of terrain-following grid cells, the number and size of which are chosen so as to constrain the boundary layer in which dispersion and chemical transformations take place. The vertical grid structure selected for this analysis is presented below in Table 2-3. The same cell face heights were used for both CALMET and CALPUFF.

Figure 2-1 VISTAS Domain Map

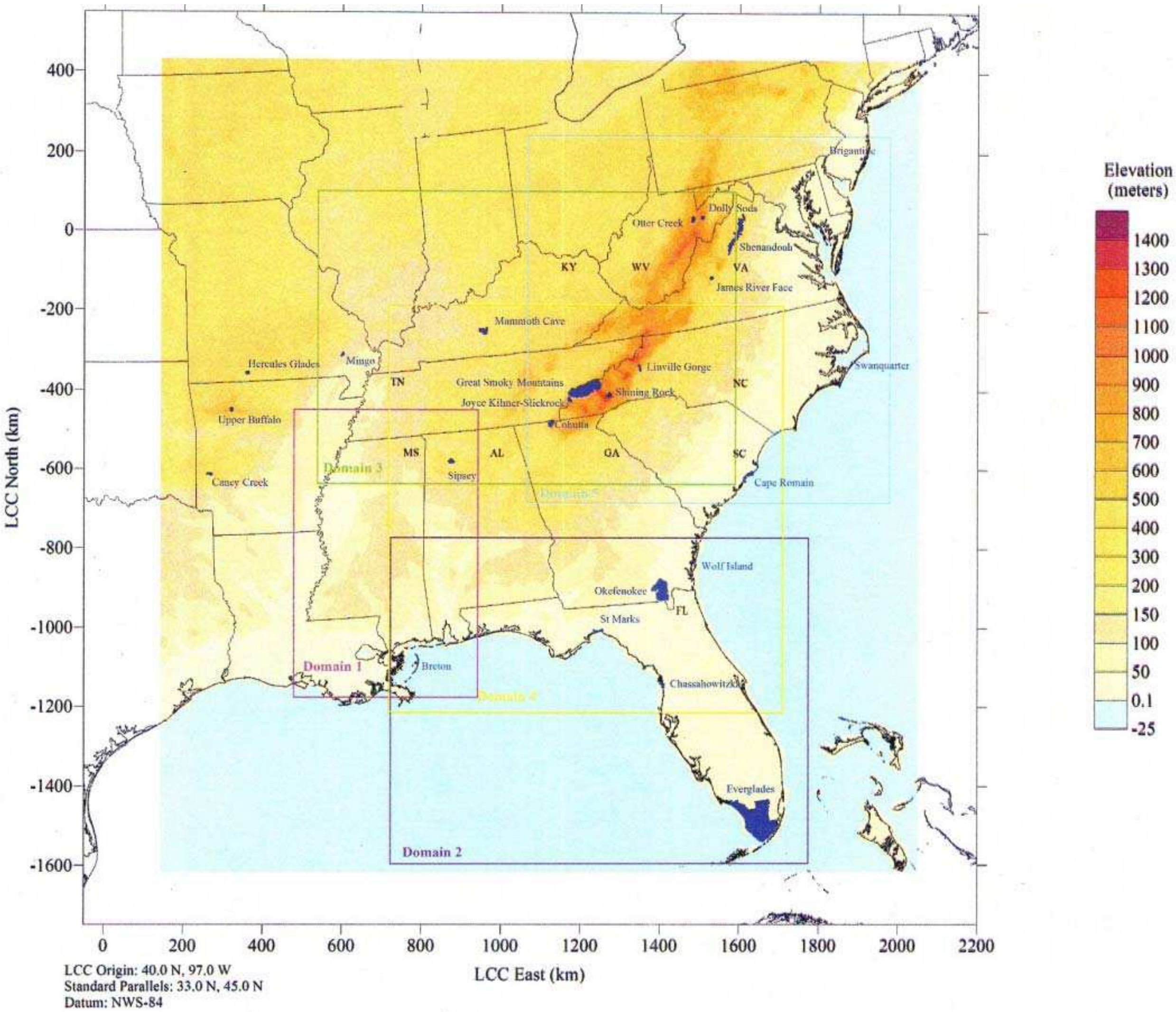


Table 2-3 Vertical Grid Structure

Vertical Grid Cell	Cell Face Height (meters)
1	0
2	20
3	40
4	80
5	160
6	320
7	640
8	1200
9	2000
10	3000
11	4000

2.5 Receptor Locations

The National Park Service (NPS) Air Resources Division has developed a database of modeling receptors for all federal Class I areas in the United States.[10] The database provides the location (latitude / longitude, decimal degrees) coordinates and elevation information for receptors for each Class I area. Receptor locations obtained from the database for Breton NWR were converted to the Lambert Conformal Conic coordinate system using the COORDS coordinate conversion program. Receptor locations as utilized in the model are presented in Appendix D for reference.

2.6 CALPUFF Model Processing

Using the three-dimensional meteorological data provided by CALMET, CALPUFF simulates the dispersion, deposition, and chemical transformation of discrete puffs of mass from emission sources. Each puff contains concentrations of NO_X, SO_2, nitrates, sulfates, and particulates and is advanced throughout the domain while deposition and chemical transformation processes take place. CALPUFF is a Lagrangian puff model, the principal advantages of which are that puffs can evolve dynamically and chemically over time and can respond to complex winds caused by terrain effects, stagnation, or recirculation.

The emissions data input into CALPUFF for sources modeled is discussed in Sections 2 and 3 of this Report. The visibility analysis were performed with the deposition and chemical transformation algorithms enabled.

A full resistance model is provided in CALPUFF for the computation of dry deposition rates of gases and particulate matter as a function of geophysical parameters, meteorological conditions, and pollutant species. An empirical scavenging coefficient approach using default options were enabled in CALPUFF to compute the depletion and wet deposition fluxes resulting from precipitation scavenging.

10 National Park Service. Class I Receptors. https://www.nature.nps.gov/air/maps/Receptors/index.cfm. Accessed June 2017.

The CALPUFF model is capable of simulating linear chemical transformation effects by using pseudo-first-order chemical reaction mechanisms for the conversions of SO_2 to SO_4, and NO_X, which consists of nitric oxide and nitrogen dioxide (NO_2), to NO_3 and HNO_3. In this analysis, chemical transformations involving five species (SO_2, SO_4, NO_X, HNO_3, and NO_3) were modeled.

In addition, two user-selected input parameters are available that affect the Lagrangian variable-trajectory puff- superposition model (MESOPUFF II) chemical transformation: ammonia concentrations and ozone concentrations. The selection of each parameter is discussed separately.

2.6.1 Ozone

Ambient ozone concentrations can be input to the model as a background level or using hourly, spatially varying observations. For this modeling analysis, data from the VISTAS Domain 1 Ozone background levels were used.

2.6.2 Ammonia

The IWAQM Phase 2 Summary Report[11] (IWAQM Guidance) recommends the use of spatially constant background ammonia concentrations to participate in the MESOPUFF II chemical transformation mechanism. In the absence of an extensive monitoring network for ammonia and because of the limitation of CALPUFF to simulate only a single, domain-average background ammonia level for each month of analysis, a single value was used. AM/NS used a default background concentration of 3 ppb for ammonia for this analysis.

2.6.3 CALPUFF Processing Control

CALPUFF modeling was conducted using the recommended regulatory default options specified in Appendix B of the IWAQM Guidance. The integrated puff representation was used, and puff splitting was disabled.

2.7 CALPOST Post processing analysis

The CALPOST post processor has been used to compute the ambient concentrations for assessment against the total deposition of sulfur and nitrogen within the Class I area for assessment against the DAT, and the 24-hour average change in light extinction using CALPOST Method 8.

For estimating the extent of nitrogen and sulfur deposition, a post processing package in CALPUFF (POSTUTIL) was utilized to combine the appropriate wet and dry fluxes of nitrogen- and sulfur-bearing species deposited as particles and gases. These combined fluxes were then processed using CALPOST to obtain the nitrogen and sulfur deposition values.

CALPOST Method 8 was used to determine 24-hr changes in visibility. The 98th percentile value for each year (i.e., the eighth highest value) was compared to the FLM recommended visibility level of 5 percent daily change.[12]

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11 U.S. Environmental Protection Agency. Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts. December 1998. https://www3.epa.gov/scram001/7thconf/calpuff/phase2.pdf. Accessed June 2017.

12 2010 FLAG Report, p. 23.

3. CLASS I VISIBILITY MODELING ANALYSIS APPROACH

Visibility can be affected by plume impairment or regional haze. Plume impairment results when there is a contrast or color difference between the plume and a viewed background (the sky or a terrain feature). Plume impairment is generally only of concern when the Class I area is near the proposed source (i.e., less than 50 km). In general, the near field visibility analysis is performed using VISCREEN or a model used for plume estimation (PLUVUE-II). For calculating the effect of a plume on visibility, a background visibility, expressed as a visual range (vr), must be input to these models.

Visual range can be related to extinction with the following equation using the light-extinction coefficient (b_{ext}):

$$b_{ext}(Mm^{-1}) = 3912/vr\ (Mm^{-1})$$

However, because the distance between the proposed project operations and the nearest Class I area is greater than 50 km, only regional haze is considered in this analysis.

Regional haze (uniform haze impairment) occurs at distances where the plume has become evenly dispersed into the atmosphere such that there is no definable plume. Most visibility impairment is in the form of regional haze. The primary causes of regional haze are sulfates (SO_4) and nitrates (NO_3) (primarily as ammonium salts), which are formed from emissions of SO_2 and NO_X through chemical reactions in the atmosphere. These reactions take time; hence, the distance of the puffs from the emissions source is important. For locations close to the emissions source, little NO_X or SO_2 forms nitrate or sulfate, whereas far from a source nearly all SO_2 forms sulfate and most NO_X forms nitrate. Particulate emissions also contribute to regional haze but to a lesser extent because sulfates and nitrates are hygroscopic species that increasingly reduce visibility with increased relative humidity.

Visibility degradation due to regional haze is measured using the b_{ext} and change in light extinction (Δb_{ext}). The b_{ext} is the attenuation of light per unit distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change that is measured by a visibility index called the deciview. The change in light extinction (Δb_{ext}) or delta-deciview (Δdv) is defined as the differences between background and predicted post-project light extinction coefficients.

$$\Delta b_{ext} = \Delta dv = (b_{exts} + b_{extb} - b_{extb}) / b_{extb}$$
$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

where: b_{exts} is the extinction coefficient calculated for the source, and
b_{extb} is the background extinction coefficient based on 20 percent best days.

Based on NPS guidance, if the change in extinction is less than 5 percent, no further analysis is required (2010 FLAG report). The visibility reduction attributable to a single facility that is generally acceptable to the FLM is a 5 percent increase in light extinction on a 24-hour average basis. There are a number of available methods that can be used to estimate the percentage change of light extinction coefficient associated with an emissions source. The peak 24-hour average visibility impairment as predicted by the air quality model is one conservative measure used to attribute visibility affects to a single source.

However, as stated in the preamble of the U.S. EPA's Regional Haze Regulations and Guidelines for BART Determinations, the CALPUFF model uses a simplified chemistry that "…tends to magnify the actual visibility effects" of a source (BART 2005).[13]

Therefore, the U.S. EPA recommends the consideration of the 98th percentile of modeled 24-hr visibility values per year to assess visibility impacts, and states in the preamble:[14]

> [W]e believe it is appropriate to use the 98th percentile—a more robust approach that does not give undue weight to the extreme tail of the distribution. The use of the 98th percentile of modeled visibility values would appear to exclude roughly 7 days per year from consideration. In our judgment, this approach effectively captures the sources that contribute to visibility impairment in a Class I area, while minimizing the likelihood that the highest modeled visibility impacts might be caused by unusual meteorology or conservative assumptions in the mode.

The use of the 98th percentile approach has also been formalized in the 2010 FLAG Report.

3.1 Background Extinction

As specified in the 2010 FLAG Report, the background extinction coefficient should be calculated using the IMPROVE equation for calculating light extinction.[15] The total background extinction coefficient was characterized using the annual average concentrations and Rayleigh scattering obtained from the 2010 FLAG report. The background values and Rayleigh scattering used in the visibility analyses for Breton NWR are summarized in Table 3-1 below.

Table 3-1 Background Concentrations – Breton NWR

Pollutant	Annual Average (μg/m^3)
Sulfate ($(NH_4)_2SO_4$)	0.23 μg/m^3
NH_4NO_3	0.10 μg/m^3
Organic Mass (OM)	1.78 μg/m^3
Elemental Carbon	0.02 μg/m^3
Soil	0.48 μg/m^3
Coarse Mass	3.01 μg/m^3
Sea Salt	0.19 μg/m^3
Rayleigh Scattering	11 Mm^{-1}

Monthly average relative humidity adjustment values for the Class I areas are shown in Table 3-2 as obtained from Table 7-9 of Section 3 of the 2010 FLAG Report.

13 40 C.F.R. Part 51, Subpart P. Regional Haze Regulations and Guidelines for BART Determinations; Final Rule, 70 Fed. Reg. 39104 (July 6, 2005). https://www.gpo.gov/fdsys/pkg/FR-2005-07-06/pdf/05-12526.pdf. Accessed June 2017.

14 70 Fed. Reg. 39104, at 39121.

15 2010 FLAG Report, p. 29.

Table 3-2 Relative Humidity Adjustment Factors – Breton NWR

Month	Small Sulfate Adjustment Factor	Large Sulfate Adjustment Factor	Sea Salt Adjustment Factor
January	4.08	2.91	4.10
February	3.82	2.76	3.89
March	3.79	2.74	3.87
April	3.74	2.72	3.85
May	3.94	2.83	4.02
June	4.12	2.94	4.21
July	4.41	3.10	4.44
August	4.37	3.07	4.38
September	4.18	2.97	4.23
October	3.92	2.82	3.99
November	3.93	2.83	4.01
December	4.06	2.90	4.11

4. CLASS I DEPOSITION MODELING ANALYSIS APPROACH

In the deposition analysis, the contribution of proposed project operations to the deposition of chemical species in the Class I area was evaluated against the deposition assessment threshold (DAT) values for sulfate and nitrate set by the FLM. The DAT represents *"the additional amount of N or S deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant."* The threshold is not necessarily an adverse impact threshold. FLM guidance for assessment of deposition impacts suggests that an appropriate sulfur and nitrogen DAT is 0.01 kg/ha/yr (each) for Class I areas in the Eastern United States.

The procedures specified in the 2010 FLAG Phase I Report has been used to model nitrogen and sulfur deposition. The total deposition is the sum of wet deposition and dry deposition.

For sulfur, both wet and dry fluxes of SO_2 and sulfates (SO_4) were modeled. Direct SO_4 emissions from the proposed project were very small but were included as a model input. Since SO_2 can chemically transform into SO_4 over time, wet and dry fluxes of both SO_2 and SO_4 were used to estimate sulfur deposition.

For nitrogen, the dry flux for NO_X, and wet and dry deposition fluxes for nitrates (NO_3), nitric acid (HNO_3), and ammonium ion (NH_4) from ammonium nitrate (NH_4NO_3) and ammonium sulfate $(NH_4)_2SO_4$ were modeled. In CALPUFF, NOx is weighed as NO_2, ammonium nitrate is weighed as NO_3, and ammonium sulfate is weighed as SO_4. Sulfate is assumed to contribute to N deposition as well as S deposition. The following describes the basis for the factors that were used in POSTUTIL for each species to calculate total sulfur and nitrogen deposition:

Total S deposition =	(32/64) x (total SO_2 deposition) +	*1 mole S in SO_2*
	(32/96) x (total SO_4 deposition)	*1 mole S in $(NH4)_2SO_4$*
Total N deposition =	(28/96) x (total SO_4 deposition) +	*2 moles of N in $(NH4)_2SO_4$*
	(14/46) x (total NO_x deposition) +	*1 mole of N in NO_x*
	(14/63) x (total HNO_3 deposition) +	*1 mole of N in HNO_3*
	(28/62) x (total NO_3 deposition) +	*2 moles of N in NH_4NO_3*

Based on the molar ratios described above, the following factors were applied to the modeled species in POSTUTIL to arrive at values of total sulfur (S) and nitrogen (N):

$$\text{Total Sulfur [S]} = 0.500000[SO_2] + 0.333333[SO_4]$$

$$\text{Total Nitrogen [N]} = 0.291667[SO_4] + 0.304348[NO_X] + 0.222222[HNO_3] + 0.451613[NO_3]$$

There are no HNO_3, $(NH_4)_2SO_4$, or $(NH_4)NO_3$ emissions from the proposed project, however, SO_2 and NO_X can chemically transform into SO_4 and NO_3 respectively over time, which in turn can form $(NH_4)_2SO_4$, $(NH_4)NO_3$, or HNO_3. Therefore, the dry flux of NO_X, and wet and dry fluxes of $(NH_4)_2SO_4$, (NH_4) NO_3, and HNO_3 were used to estimate nitrogen deposition.

In accordance with the 2010 FLAG report, gas phase deposition was modeled for SO_2, NO_X, and HNO_3, and particle phase deposition wasf modeled for SO_4 and NO_3. The contributions of the proposed project to the deposition of nitrogen and sulfur species in the Class I area were estimated as part of the modeling analysis, and were assessed against the appropriate DAT. Although the sulfur and nitrogen DATs are specified based on an annual averaging period, 24-hour maximum emission rates for the pollutants were conservatively modeled to estimate deposition impacts.

5. CLASS I VISIBILITY AND DEPOSITION RESULTS

A preliminary Class I visibility analysis was performed to determine if the proposed Project would have a significant impact on visibility at the Class I area. CALPOST Method 8 (Mode 5) were used to determine the potential impacts on visibility at Breton NWR. The worst-case 98th percentile 24-hour change in visibility due to emissions from the project was used to compare to a daily visibility significance level of 5 percent visibility change. The daily visibility change was assessed against existing visibility for Breton NWR that is based on annual average natural conditions. The visibility results from the visibility modeling analyses are shown in Table 5-1.

Table 5-1 Visibility Analysis Results from the Proposed Project – Average Annual Background

Year	Visibility Change from Project (% change)	FLM Threshold (% change)
2001	3.29	5
2002	2.44	5
2003	3.00	5

Based on the results shown in Table 5-1, emissions from the project at AM/NS would not have a significant impact on visibility in the Breton NWR.

Sulfur and nitrogen deposition analyses were performed to determine if the proposed facility could have a potential significant impact on sulfur and nitrogen deposition in Breton NWR. The total deposition (wet and dry fluxes) of sulfur dioxide (SO_2) and sulfate (SO_4) was used to determine the project sulfur (S) loading for comparison to the deposition analysis threshold (DAT)[16] for eastern Class I areas. Similarly, the total deposition (wet and dry fluxes) of nitrogen oxides (NO_X – dry deposition only), nitrate (NO_3), and nitric acid (HNO_3) was used to determine the project nitrogen (N) loading for comparison to the DAT for eastern Class I areas. The POSTUTIL post-processing utility program was used to sum the wet and dry deposition values from the hourly CALPUFF flux model output. The total S and N deposition flux ("loading"), in units of kilogram/(hectare-year) were then calculated through the CALPOST post-processing program.

The sulfur and nitrogen deposition results are shown in Table 5-2. The results shown in Table 5-2 demonstrate that the emissions from the project at AM/NS would not have a significant impact on the sulfur and nitrogen deposition in the Breton NWR.

16 Federal Land Managers' Interagency Guidance for Nitrogen and Sulfur Deposition Analyses, National Park Service, Natural Resource report NPS/NRSS/ARD/NRR – 2001/465, November 2011

Table 5-2 Sulfur and Nitrogen Deposition Analysis Results from the Proposed Project

Class I Area	Model Year	Species	Threshold Value (Kg/Ha/Yr)	Maximum Modeled Deposition (Kg/Ha/Yr)
Breton Wilderness Area	2001	Sulfate	0.01	0.0072
	2002			0.0051
	2003			0.0053
	2001	Nitrate	0.01	0.0012
	2002			0.0009
	2003			0.0005

APPENDIX A Q/D ANALYSES

Q/D CALCULATIONS

$$[H_2SO_4 + SO_2 + NO_x + PM_{10} \text{ emissions (tpy)}]/ \text{distance (km)} > 10$$

Project Emissions (Maximum Daily Annualized)

Pollutant	Maximum Daily Annualized (tpy)
Sulfuric Acid Mist (H_2SO_4)	0
Sulfur Dioxide (SO_2)	1,013.98
Nitrogen Oxides (NO_X)	1,025.82
Particulate Matter less than 10 microns (PM_{10})	672.50

Location of the Project Relative to Class I Areas

Class I Area, State	Distance from Terminal Site to Class I Area (km)	Direction from Terminal Site to Class I Area	Federal Land Manager
Breton National Wildlife Refuge, LA (Breton NWR), LA	130.0	Southwest	U.S. Fish & Wildlife Service (FWS)
Sipsey Wilderness Area, AL	351.1	Northeast	U.S. Department of Agriculture Forest Service (USDA/FS)

Breton NWR Q/D Analysis:

[0 tpy + 1,013.98 tpy + 1,025.82 tpy + 672.50 tpy] / 130.0 km = 20.9; 20.9 **> 10**

Sipsey Q/D Analysis:*

[0 tpy + 1,013.98 tpy + 1,025.82 tpy + 672.50 tpy] / 351.1 km = 7.7; 7.7 **< 10**

APPENDIX B STACK PARAMETERS AND EMISSIONS

Table B-1 Stack Parameters of Point Sources

Modeling ID	Description	Source Type	UTM_E	UTM_N	LCC_Y	LCC_X	Base Elevation	Stack Height	Exit Temperature	Velocity	Stack Diameter
			m	m	km	km	m	m	K	m/s	m
EAF1	Electric Arc Furnace 1	Point	406,746.0	3,446,703.8	-938.47	860.22	14.9	61.00	391.48	23.03	6.50
EAF2	Electric Arc Furnace 2	Point	406,755.4	3,446,673.6	-938.50	860.24	14.9	61.00	391.48	23.03	6.50
CT1	Cooling Tower 1	Point	406,601.4	3,446,809.9	-938.38	860.07	14.9	9.14	305.37	12.19	9.14
CT2	Cooling Tower 2	Point	406,716.0	3,446,736.8	-938.44	860.19	14.9	9.14	305.37	12.19	9.14
DEGAS_1	Degasser Flare 1	Point	406,785.7	3,446,960.6	-938.23	860.37	14.9	50.37	1273.00	20.00	0.40
DEGAS_2	Degasser Flare 2	Point	406,887.2	3,446,917.8	-938.22	860.20	14.9	54.69	1273.00	20.00	0.30
ALLOY01	Silo 1	Point	407,021.7	3,446,747.0	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY02	Silo 2	Point	407,019.8	3,446,745.0	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY03	Silo 3	Point	407,017.7	3,446,743.0	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY04	Silo 4	Point	407,015.7	3,446,741.1	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY05	Silo 5	Point	407,013.6	3,446,739.1	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY06	Silo 6	Point	407,011.7	3,446,737.2	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY07	Silo 7	Point	407,019.6	3,446,749.1	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY08	Silo 8	Point	407,017.6	3,446,747.2	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY09	Silo 9	Point	407,015.6	3,446,745.2	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY10	Silo 10	Point	407,013.6	3,446,743.3	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY11	Silo 11	Point	407,011.5	3,446,741.3	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY12	Silo 12	Point	407,009.5	3,446,739.4	-938.41	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY13	Silo 13	Point	407,015.4	3,446,753.5	-938.39	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY14	Silo 14	Point	407,013.4	3,446,751.6	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY15	Silo 15	Point	407,011.3	3,446,749.6	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY16	Silo 16	Point	407,009.3	3,446,747.7	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY17	Silo 17	Point	407,007.3	3,446,745.7	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY18	Silo 18	Point	407,005.3	3,446,743.8	-938.41	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY19	Silo 19	Point	407,013.2	3,446,755.7	-938.39	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY20	Silo 20	Point	407,011.3	3,446,753.8	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY21	Silo 21	Point	407,009.2	3,446,751.8	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY22	Silo 22	Point	407,007.2	3,446,749.9	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY23	Silo 23	Point	407,005.1	3,446,747.9	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY24	Silo 24	Point	407,003.2	3,446,745.9	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
BH01	BH Silo 1	Point	406,776.1	3,446,711.2	-938.46	860.25	14.9	18.29	298.15	0.51	1.03
BH02	BH Silo 2	Point	406,783.1	3,446,717.9	-938.46	860.26	14.9	18.29	298.15	0.51	1.03

Table B-1 Stack Parameters of Point Sources

Modeling ID	Description	Source Type	UTM_E	UTM_N	LCC_Y	LCC_X	Base Elevation	Stack Height	Exit Temperature	Velocity	Stack Diameter
DRI01	DRI Silo 1	Point	407,087.4	3,446,800.7	-938.34	860.55	14.9	27.43	298.15	0.45	1.03
DRI02	DRI Silo 2	Point	407,072.1	3,446,785.8	-938.36	860.54	14.9	27.43	298.15	0.45	1.03
DRI03	DRI Silo 3	Point	407,056.8	3,446,771.0	-938.37	860.53	14.9	27.43	298.15	0.45	1.03
DRI04	DRI Silo 4	Point	407,041.5	3,446,756.1	-938.39	860.51	14.9	27.43	298.15	0.45	1.03
DRI05	DRI Silo 5	Point	407,072.6	3,446,816.0	-938.33	860.54	14.9	27.43	298.15	0.45	1.03
DRI06	DRI Silo 6	Point	407,057.3	3,446,801.1	-938.34	860.52	14.9	27.43	298.15	0.45	1.03
DRI07	DRI Silo 7	Point	407,042.0	3,446,786.3	-938.36	860.51	14.9	27.43	298.15	0.45	1.03
DRI08	DRI Silo 8	Point	407,026.7	3,446,771.4	-938.38	860.50	14.9	27.43	298.15	0.45	1.03
LIME01	LDB Silo 1	Point	407,032.6	3,446,738.4	-938.41	860.51	14.9	32.80	298.15	0.11	1.03
LIME02	LDB Silo 2	Point	407,029.8	3,446,735.7	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME03	LDB Silo 3	Point	407,026.9	3,446,732.9	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME04	LDB Silo 4	Point	407,024.1	3,446,730.1	-938.42	860.50	14.9	32.80	298.15	0.11	1.03
LIME05	LDB Silo 5	Point	407,021.2	3,446,727.4	-938.42	860.50	14.9	32.80	298.15	0.11	1.03
LIME06	LDB Silo 6	Point	407,029.9	3,446,741.3	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME07	LDB Silo 7	Point	407,027.0	3,446,738.5	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME08	LDB Silo 8	Point	407,024.2	3,446,735.7	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME09	LDB Silo 9	Point	407,021.3	3,446,733.0	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME10	LDB Silo 10	Point	407,018.5	3,446,730.2	-938.42	860.49	14.9	32.80	298.15	0.11	1.03
INJECT01	Flux Silo 1	Point	406,986.7	3,446,739.7	-938.41	860.46	14.9	17.25	298.15	0.11	1.03
INJECT02	Flux Silo 2	Point	406,981.7	3,446,744.9	-938.41	860.45	14.9	17.25	298.15	0.11	1.03
INJECT03	Flux Silo 3	Point	406,976.8	3,446,750.0	-938.40	860.45	14.9	17.25	298.15	0.11	1.03
INJECT04	Flux Silo 4	Point	406,972.2	3,446,754.7	-938.40	860.44	14.9	17.25	298.15	0.11	1.03
INJECT05	Flux Silo 5	Point	406,966.9	3,446,760.1	-938.39	860.44	14.9	17.25	298.15	0.11	1.03
HBI01	HBI Silo 1	Point	407,039.6	3,446,733.0	-938.41	860.51	14.9	15.54	298.15	0.45	1.03
HBI02	HBI Silo 2	Point	407,037.8	3,446,731.3	-938.41	860.51	14.9	15.54	298.15	0.45	1.03
HBI03	HBI Silo 3	Point	407,033.9	3,446,727.5	-938.42	860.51	14.9	15.54	298.15	0.45	1.03
HBI04	HBI Silo 4	Point	407,032.1	3,446,725.8	-938.42	860.51	14.9	15.54	298.15	0.45	1.03
CAST_1	Contact Water Stack 1	Point	406,862.7	3,446,973.9	-938.19	860.31	14.9	51.37	333.15	42.28	1.42
CAST_2	Contact Water Stack 2	Point	406,831.0	3,447,008.9	-938.16	860.28	14.9	51.37	333.15	42.28	1.42
ESP	Scarfing ESP	Point	406,920.4	3,447,158.3	-938.00	860.35	14.9	65.00	333.15	20.00	2.20

Table B-2 Emissions from Point Sources

Modeling ID	Description	Source Type	SO_2 Emissions	NOx Emissions	PM_{10} Emissions
			g/s	g/s	g/s
EAF1	Electric Arc Furnace 1	Point	14.58	14.58	7.82
EAF2	Electric Arc Furnace 2	Point	14.58	14.58	7.82
CT1	Cooling Tower 1	Point	0.00	0.00	0.00400
CT2	Cooling Tower 2	Point	0.00	0.00	0.00400
DEGAS_1	Degasser Flare 1	Point	0.00	0.19	0.04172
DEGAS_1	Degasser Flare 1	Point	0.00115	0.1921	0.0417
DEGAS_2	Degasser Flare 2	Point	0.00039	0.0643	0.0320
ALLOY01	Silo 1	Point	0.00	0.00	0.00108
ALLOY02	Silo 2	Point	0.00	0.00	0.00108
ALLOY03	Silo 3	Point	0.00	0.00	0.00108
ALLOY04	Silo 4	Point	0.00	0.00	0.00108
ALLOY05	Silo 5	Point	0.00	0.00	0.00108
ALLOY06	Silo 6	Point	0.00	0.00	0.00108
ALLOY07	Silo 7	Point	0.00	0.00	0.00108
ALLOY08	Silo 8	Point	0.00	0.00	0.00108
ALLOY09	Silo 9	Point	0.00	0.00	0.00108
ALLOY10	Silo 10	Point	0.00	0.00	0.00108
ALLOY11	Silo 11	Point	0.00	0.00	0.00108
ALLOY12	Silo 12	Point	0.00	0.00	0.00108
ALLOY13	Silo 13	Point	0.00	0.00	0.00108
ALLOY14	Silo 14	Point	0.00	0.00	0.00108
ALLOY15	Silo 15	Point	0.00	0.00	0.00108
ALLOY16	Silo 16	Point	0.00	0.00	0.00108
ALLOY17	Silo 17	Point	0.00	0.00	0.00108
ALLOY18	Silo 18	Point	0.00	0.00	0.00108
ALLOY19	Silo 19	Point	0.00	0.00	0.00108
ALLOY20	Silo 20	Point	0.00	0.00	0.00108
ALLOY21	Silo 21	Point	0.00	0.00	0.00108
ALLOY22	Silo 22	Point	0.00	0.00	0.00108
ALLOY23	Silo 23	Point	0.00	0.00	0.00108
ALLOY24	Silo 24	Point	0.00	0.00	0.00108
BH01	BH Silo 1	Point	0.00	0.00	0.00483

Table B-2 Emissions from Point Sources

Modeling ID	Description	Source Type	SO_2 Emissions	NOx Emissions	PM_{10} Emissions
BH02	BH Silo 2	Point	0.00	0.00	0.00483
DRI02	DRI Silo 2	Point	0.00	0.00	0.00432
DRI03	DRI Silo 3	Point	0.00	0.00	0.00432
DRI04	DRI Silo 4	Point	0.00	0.00	0.00432
DRI05	DRI Silo 5	Point	0.00	0.00	0.00432
DRI06	DRI Silo 6	Point	0.00	0.00	0.00432
DRI07	DRI Silo 7	Point	0.00	0.00	0.00432
DRI08	DRI Silo 8	Point	0.00	0.00	0.00432
LIME01	LDB Silo 1	Point	0.00	0.00	0.00108
LIME02	LDB Silo 2	Point	0.00	0.00	0.00108
LIME03	LDB Silo 3	Point	0.00	0.00	0.00108
LIME04	LDB Silo 4	Point	0.00	0.00	0.00108
LIME05	LDB Silo 5	Point	0.00	0.00	0.00108
LIME06	LDB Silo 6	Point	0.00	0.00	0.00108
LIME07	LDB Silo 7	Point	0.00	0.00	0.00108
LIME08	LDB Silo 8	Point	0.00	0.00	0.00108
LIME09	LDB Silo 9	Point	0.00	0.00	0.00108
LIME10	LDB Silo 10	Point	0.00	0.00	0.00108
INJECT01	Flux Silo 1	Point	0.00	0.00	0.00108
INJECT02	Flux Silo 2	Point	0.00	0.00	0.00108
INJECT03	Flux Silo 3	Point	0.00	0.00	0.00108
INJECT04	Flux Silo 4	Point	0.00	0.00	0.00108
INJECT05	Flux Silo 5	Point	0.00	0.00	0.00108
HBI01	HBI Silo 1	Point	0.00	0.00	0.00432
HBI02	HBI Silo 2	Point	0.00	0.00	0.00432
HBI03	HBI Silo 3	Point	0.00	0.00	0.00432
HBI04	HBI Silo 4	Point	0.00	0.00	0.00432
CAST_1	Contact Water Stack 1	Point	0.00	0.00	0.433
CAST_2	Contact Water Stack 2	Point	0.00	0.00	0.433
ESP	Scarfing ESP	Point	0.00	0.04	1.935

Table B-3 Stack Parameters of Area Sources

Modeling ID	Description	Source Type	Base Elevation	Area	Effective Height	Sigma Z
			m	m^2	m	m
SLGH	Slag Handling	Area	14.9	14233	3.0	0.00
SLGD	Slag Drop	Area	14.9	14233	3.0	0.00
SP_MT	Storage Piles & Material Transfer	Area	14.9	80349	3.0	0.00
IA_ST	Insignificant Activity - Scrap Torching	Area	14.9	26.7	2.0	0.00
IA_SC	Insignificant Activity - Slab Cutting	Area	14.9	26.7	2.0	0.00
Truck	Truck Traffic	Area	14.9	16105778	3.0	0.00

Table B-4 Stack Locations of Area Sources

Modeling ID	Description	Source Type	LCC X1	LCC X2	LCC X3	LCC X4	LCC Y1	LCC Y2	LCC Y3	LCC Y4
			km	km	km	km	km	km	km	km
SLGH	Slag Handling	Area	860.110	860.229	860.290	860.167	-938.317	-938.423	-938.352	-938.252
SLGD	Slag Drop	Area	860.110	860.229	860.290	860.167	-938.317	-938.423	-938.352	-938.252
SP_MT	Storage Piles & Material Transfer	Area	860.110	860.229	860.290	860.167	-938.317	-938.423	-938.352	-938.252
IA_ST	Insignificant Activity - Scrap Torching	Area	860.188	860.191	860.196	860.193	-938.330	-938.327	-938.333	-938.335
IA_SC	Insignificant Activity - Slab Cutting	Area	860.188	860.191	860.196	860.193	-938.330	-938.327	-938.333	-938.335
Truck	Truck Traffic	Area	857.322	860.914	861.413	857.812	-937.746	-937.338	-941.858	-942.257

Table B-5 Emissions from Area Sources

Modeling ID	Description	Source Type	SO_2 Emissions	NOx Emissions	PM_{10} Emissions
			$g/s/m^2$	$g/s/m^2$	$g/s/m^2$
SLGH	Slag Handling	Area	0.00	0.00	1.05E-06
SLGD	Slag Drop	Area	0.00	0.00	1.58E-07
SP_MT	Storage Piles & Material Transfer	Area	0.00	0.00	6.19E-06
IA_ST	Insignificant Activity - Scrap Torching	Area	1.89E-06	2.83E-04	3.05E-04
IA_SC	Insignificant Activity - Slab Cutting	Area	9.20E-08	1.50E-05	2.85E-07
Truck	Truck Traffic	Area	0.00E+00	0.00E+00	1.16E-08

APPENDIX C PM10 EMISSIONS PARTICLE SIZE DISTRIBUTION

Table C-1 Emissions from Point Sources

Modeling ID	Emissions (g/s)								
	SO4	NO3	PM0050	PM0100	PM0250	PM0500	PM0600	PM1000	Total PM10
EAF1	0.34	0.41	6.88	0	0	0	0	0.1859	7.82
EAF2	0.34	0.41	6.88	0	0	0	0	0.1859	7.82
CT1	0	0	0	0	1.324E-05	0	0	0.0040	0.0040
CT2	0	0	0	0	1.324E-05	0	0	0.0040	0.0040
DEGAS_1	0	0	0	0.0032722	0.0089984	0.01227	0.00327	0.0139	0.042
DEGAS_2	0	0	0	0.0025102	0.0069031	0.00941	0.00251	0.0107	0.032
SILO_1	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_2	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_3	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_4	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_5	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_6	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_7	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_8	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_9	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_10	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_11	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_12	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_13	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_14	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_15	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_16	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_17	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_18	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_19	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_20	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_21	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_22	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_23	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_24	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
BH01	0	0	0	0.0003791	0.0010424	0.00142	0.00038	0.0016	0.0048
BH02	0	0	0	0.0003791	0.0010424	0.00142	0.00038	0.0016	0.0048

Table C-2 Emissions from Area Sources

Modeling ID	Emissions (g/s/m²)								
	SO4	NO3	PM0050	PM0100	PM0250	PM0500	PM0600	PM1000	Total PM10
SLGH	0.00	0.00	0.00	8.26E-08	2.27E-07	3.10E-07	8.26E-08	3.51E-07	1.05E-06
SLGD	0.00	0.00	0.00	1.24E-08	3.40E-08	4.64E-08	1.24E-08	5.26E-08	1.58E-07
SP_MT	0.00	0.00	0.00	4.86E-07	1.34E-06	1.82E-06	4.86E-07	2.06E-06	6.19E-06
IA_ST	0.00	0.00	0.00	1.52E-04	1.52E-04	0.00	0.00	0.00	3.05E-04
IA_SC	0.00	0.00	0.00	1.42E-04	1.42E-04	0.00	0.00	0.00	2.83E-04
Truck	0.00	0.00	0.00	9.09E-10	2.50E-09	3.41E-09	9.09E-10	3.86E-09	1.16E-08

APPENDIX D BRETON NATIONAL WILDLIFE REFUGE – RECEPTOR INFORMATION

Receptor ID	Latitude (N) (deg)	Longitude (W) (deg)	Elevation (m)	Height (m)
Bret1	29.621	89.004	0	0
Bret2	29.637	88.979	0	0
Bret3	29.646	88.971	0	0
Bret4	29.654	88.963	0	0
Bret5	29.721	88.913	0	0
Bret6	29.762	88.871	0	0
Bret7	29.787	88.863	0	0
Bret8	29.804	88.846	1	0
Bret9	29.812	88.846	1	0
Bret10	29.829	88.838	1	0
Bret11	29.837	88.838	1	0
Bret12	29.854	88.829	1	0
Bret13	29.862	88.829	1	0
Bret14	29.871	88.829	1	0
Bret15	29.879	88.829	1	0
Bret16	29.887	88.829	0	0
Bret17	29.896	88.829	0	0
Bret18	29.912	88.829	0	0
Bret19	29.912	88.821	1	0
Bret20	29.921	88.821	1	0
Bret21	29.929	88.829	0	0
Bret22	29.929	88.821	1	0
Bret23	29.937	88.829	0	0
Bret24	29.937	88.821	1	0
Bret25	29.946	88.829	1	0
Bret26	29.954	88.829	1	0
Bret27	29.962	88.838	0	0
Bret28	29.962	88.829	1	0
Bret29	29.971	88.838	0	0
Bret30	29.971	88.829	1	0
Bret31	29.979	88.838	0	0
Bret32	29.987	88.838	0	0
Bret33	29.996	88.838	1	0

Bret34	30.004	88.846	0	0
Bret35	30.012	88.846	0	0
Bret36	30.021	88.854	0	0
Bret37	30.029	88.854	1	0
Bret38	30.037	88.863	0	0
Bret39	30.046	88.871	0	0
Bret40	30.054	88.879	0	0

APPENDIX E CLASS I AQRV MODELING PROTOCOL CORRESPONDENCE LOG

From:	Joe Gross
To:	Collins, Catherine; tim_allen@fws.gov
Cc:	Tom Wickstrom; Robert Pinckard (robert.pinckard@arcelormittal.com); Stewart, Steven D; Vikram Kashyap
Subject:	AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date:	Monday, January 13, 2020 9:54:00 AM
Attachments:	image001.png 25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Good Morning Catherine and Tim,

AM/NS Calvert, LLC (AM/NS) owns and operates a carbon steel mill located in Calvert, Alabama. The Title V permit was issued by the Alabama Department of Environmental Management (ADEM) on February 24, 2015 (Permit Number 503-0095).

On behalf of AM/NS, attached for your review is the electronic copy of the Class I Air Modeling Protocol in support of a proposed PSD project.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Engineer

ERM
3838 N. Causeway Blvd. Suite 3000
Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
To: Collins, Catherine; tim_allen@fws.gov
Cc: Tom Wickstrom
Subject: RE: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Friday, January 31, 2020 8:54:00 AM
Attachments: image001.png

Good Morning Catherine and Tim,

Happy Friday!

I wanted to follow up on the email below to see how your review was going.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Consultant - Engineering

ERM
3838 N. Causeway Blvd. Suite 3000
Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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Protocol in support of a proposed PSD project.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Engineer

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Metairie, Louisiana 70002

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E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
To: Collins, Catherine; tim_allen@fws.gov
Cc: Tom Wickstrom; Robert Pinckard (robert.pinckard@arcelormittal.com)
Subject: RE: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Thursday, February 20, 2020 3:38:00 PM
Attachments: image001.png

Good Afternoon Catherine and Tim,

I wanted to follow up with you on the protocol we had sent over and see if there were any questions or concerns.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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3838 N. Causeway Blvd. Suite 3000
Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Engineer

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Metairie, Louisiana 70002

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E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
To: Collins, Catherine
Cc: tim_allen@fws.gov; Tom Wickstrom
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Thursday, March 5, 2020 10:43:00 AM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

I wanted to follow up with you on our call last week and see when we should expect to hear back regarding the Class I protocol we had submitted (email below and attached).

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Good Morning Catherine and Tim,

AM/NS Calvert, LLC (AM/NS) owns and operates a carbon steel mill located in Calvert, Alabama. The Title V permit was issued by the Alabama Department of Environmental Management (ADEM) on February 24, 2015 (Permit Number 503-0095).

On behalf of AM/NS, attached for your review is the electronic copy of the Class I Air Modeling Protocol in support of a proposed PSD project.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Engineer

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3838 N. Causeway Blvd. Suite 3000
Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
To: Collins, Catherine
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Wednesday, March 11, 2020 2:32:00 PM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Good Afternoon Catherine,

I didn't see an email from you and wanted to follow up on our call yesterday, and see when we should be expecting to hear back from you.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Thursday, March 5, 2020 10:44 AM
To: Collins, Catherine <catherine_collins@fws.gov>
Cc: tim_allen@fws.gov; Tom Wickstrom <Tom.Wickstrom@erm.com>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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I wanted to follow up with you on our call last week and see when we should expect to hear back regarding the Class I protocol we had submitted (email below and attached).

Best Regards,

Joe Gross
Senior Consultant - Engineering

ERM

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E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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Best Regards,

Joe Gross
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E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
To: Collins, Catherine
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Wednesday, March 25, 2020 2:55:00 PM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

I wanted to follow up with you on our protocol.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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From: Joe Gross
Sent: Wednesday, March 11, 2020 2:33 PM
To: Collins, Catherine <catherine_collins@fws.gov>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Good Afternoon Catherine,

I didn't see an email from you and wanted to follow up on our call yesterday, and see when we should be expecting to hear back from you.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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From: Joe Gross
Sent: Thursday, March 5, 2020 10:44 AM
To: Collins, Catherine <catherine_collins@fws.gov>
Cc: tim_allen@fws.gov; Tom Wickstrom <Tom.Wickstrom@erm.com>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Hi Catherine,

I wanted to follow up with you on our call last week and see when we should expect to hear back regarding the Class I protocol we had submitted (email below and attached).

Best Regards,

Joe Gross
Senior Consultant - Engineering

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T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Good Morning Catherine and Tim,

AM/NS Calvert, LLC (AM/NS) owns and operates a carbon steel mill located in Calvert, Alabama. The Title V permit was issued by the Alabama Department of Environmental Management (ADEM) on February 24, 2015 (Permit Number 503-0095).

On behalf of AM/NS, attached for your review is the electronic copy of the Class I Air Modeling Protocol in support of a proposed PSD project.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Engineer

ERM
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Metairie, Louisiana 70002

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E Joe.Gross@erm.com | **W** www.erm.com

From:	Joe Gross
To:	Collins, Catherine
Cc:	Robert Pinckard (robert.pinckard@arcelormittal.com)
Subject:	FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date:	Monday, March 30, 2020 2:06:00 PM
Attachments:	image001.png 25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

---

Hi Catherine,

I wanted to follow up with you regarding the Class I protocol. Please let me know if we are good to proceed as discussed in the protocol or if you have any questions or comments.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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Metairie, Louisiana 70002

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E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
To: Collins, Catherine
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Monday, April 20, 2020 1:44:00 PM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

Just wanted to follow up on our protocol.

Best Regards,

Joe Gross
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Metairie, Louisiana 70002
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From: Joe Gross
Sent: Monday, March 30, 2020 2:07 PM
To: Collins, Catherine <catherine_collins@fws.gov>
Cc: Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Hi Catherine,

I wanted to follow up with you regarding the Class I protocol. Please let me know if we are good to proceed as discussed in the protocol or if you have any questions or comments.

Best Regards,

Joe Gross
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Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
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From: Joe Gross
To: Collins, Catherine
Cc: Robert Pinckard (robert.pinckard@arcelormittal.com); Owen, Jim; Tom Wickstrom; tim_allen@fws.gov
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Friday, May 15, 2020 10:37:00 AM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

I wanted to keep this fresh in your inbox. We are still waiting on your approval for our Class I Air Modeling Protocol.

Best Regards,
Joe Gross
Senior Consultant - Engineering
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From: Joe Gross
Sent: Monday, April 20, 2020 1:45 PM
To: Collins, Catherine <catherine_collins@fws.gov>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Hi Catherine,

Just wanted to follow up on our protocol.

Best Regards,
Joe Gross
Senior Consultant - Engineering
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From: Joe Gross
Sent: Monday, March 30, 2020 2:07 PM
To: Collins, Catherine <catherine_collins@fws.gov>
Cc: Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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Please let me know if you have any questions or would like to discuss.

Best Regards,
Joe Gross
Senior Engineer
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ERM has over 160 offices across the following countries and territories worldwide

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Hong Kong	South Africa
Hungary	South Korea
India	Spain
Indonesia	Sweden
Ireland	Taiwan
Italy	Thailand
Japan	UAE
Kazakhstan	UK
Kenya	US
Malaysia	Vietnam
Mexico	
The Netherlands	

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Class I Air Quality Related Values Analysis Modeling Report

AM/NS Calvert, LLC
Calvert, Alabama

December 2020

Project No.: 0536883

The business of sustainability

ERM

Signature Page

December 2020

Class I Air Quality Related Values Analysis Modeling Report

AM/NS Calvert, LLC - Calvert, Alabama

Joe Gross Project Manager	Vikram Kashyap Partner-in-Charge

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
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(504) 831-6700

CONTENTS

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Acronyms and Abbreviations

Name	Description
ºF	degrees Fahrenheit
ADEM	Alabama Department of Environmental Management
AQRV	air quality related value
BART	best available retrofit technology
C.F.R.	Code of Federal Regulations
CALPOST	CALPUFF post processing package
CALPUFF	an advanced air quality dispersion modeling system
DAT	deposition assessment threshold
ERM	Environmental Resources Management
EPA	United States Environmental Protection Agency
FLAG	Federal Land Manager's Air Quality Related Values Work Group
FLM	Federal Land Manager
HNO_3	nitric acid
kg/ha/yr	kilograms per hectare per year
km	kilometer
m^3	cubic meter
MESOPUFF II	a Lagrangian variable-trajectory puff- superposition air dispersion modeling system
MW	megawatt or molecular weight
NH_4	ammonium ion
$(NH_4)_2SO_4$	ammonium sulfate
NH_4NO_3	ammonium nitrate
NO_2	nitrogen dioxide
NO_3	nitrate
NO_X	nitrogen oxides
NPS	National Park Service
NWR	National Wildlife Refuge
NWS	National Weather Service
PLUVUE-II	a plume estimation air dispersion modeling system
PM	particulate matter
PM_{10}	particulate matter equal to or less than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in aerodynamic diameter
PMC	coarse particulate matter (particulate matter between 2.5 and 10 microns in aerodynamic diameter)
POSTUTIL	CALPUFF post processing package
PSD	Prevention of Significant Deterioration

PTE	potential to emit
Q/d	initial annual emissions over distance screening criteria
SIL	Significant Impact Level
SMR	single mixed refrigerant
SO_2	sulfur dioxide
SO_4	sulfate
SOA	secondary organic aerosol
SOIL	inorganic fine particulate (<2.5 microns in diameter)
VISTAS	Visibility Improvement State and Tribal Association of the Southeast

1. INTRODUCTION

AM/NS Calvert, L.L.C. (AM/NS) 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 February 24, 2015 (Permit Number 503-0095).

AM/NS is submitting this application to request authorization for construction of two (2) melt shops to reduce reliance on third party raw material providers. Each melt shop will consist of:

- One (1) Electric Arc Furnaces (EAF);
- One (1) twin Ladle Metallurgy Furnace (LMF);
- One (1) Degassing operation controlled by flare; and
- One (1) Continuous Caster with spray vent, ladle/tundish preheating activities, and associated support equipment.

Each melt shop will be controlled by one (1) new baghouse for control of emissions. In addition to the melt shops, the project will include installation of auxiliary equipment including one (1) new contact cooling tower, scrap and raw material handling operations, material storage silos, and a scarfing operation for slabs.

The construction of the melt shops is proposed to be conducted in phases. Phase 1 will include the installation of the first melt shop and the associated auxiliary equipment and Phase 2 will include the installation of the second melt shop and its associated auxiliary equipment. The emission sources and potential emissions from both phases are included in this permit application.

This Class I Air Quality Related Values (AQRV) modeling report is provided in support of the permit application. The modeling report is organized as follows:

- Section 1.1 – Facility Description;
- Section 1.2 – Description of Proposed Changes;
- Section 1.3 – Regulatory Drivers and Modeling Applicability;
- Section 2.1 – Model Selection;
- Section 2.2 – Modeled Stack Parameters;
- Section 2.3 – Particulate Emissions Speciation for CALPUFF;
- Section 2.4 – Modeling Domains;
- Section 2.5 – Receptor Locations;
- Section 2.6 – CALPUFF Model Processing;
- Section 2.7 – CALPOST Post Processing Analysis;
- Section 3 – Class I Visibility Modeling Analysis Approach;

- Section 4 – Class I Deposition Modeling Analysis Approach;
- Section 5 – Class I Visibility and Deposition Results.

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 (e.g., coils, slits, sheets, blanks) 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.

The raw materials in the production of steel strip are steel slabs that are currently barged to the facility from Brazil or received from other locations or suppliers. Steel slabs are heated and rolled to form a flat strip in the Hot Strip Mill (HSM). From the HSM, the coils (flat strips) are prepared for sales or proceed to the pickling lines. After pickling, if needed, the strips may be cold-rolled to customer specifications and then sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

1.2 Description of Proposed Changes

With this application, AM/NS proposes to construct two melt shops which will allow AM/NS to produce the steel slabs which are currently imported.

The new equipment part of the proposed project will consist of the new melt shops and auxiliary sources where steel scrap and other alternative iron units will be charged and melted in an EAF. Steel scrap and other alternative iron units will be placed into the EAF where they will be charged and then melted. The resulting molten steel will be poured out of the EAF via tapping operations into a ladle which will then transfer the molten steel to a continuous caster where slabs will be formed. The slabs will leave the melt shop and be processed in the HSM and if needed may be cold-rolled after the HSM to customer specifications and then either sold or further processed in the galvanizing lines, annealed in furnaces, or temper rolled.

AM/NS is proposing to install two new melt shops in two phases. The proposed melt shop project will consist of the following new emission sources:

- Two (2) Electric Arc Furnaces (including charging, material handling, melting, slagging, tapping, casting, ladle/tundish preheating, and ladle operations) and associated baghouses;
- One (1) Contact Cooling Tower for Casting (Cooling Tower will be sized for casting from both EAFs);
- Two (2) Caster Steam Exhausts (Direct contact cooling water for Casting);
- Slag Handling Operations;
- Storage Piles (scrap and raw material handling operations) and Material Transfer;
- Two (2) Degassing Operations controlled by Flares (1 Vacuum Tank Degassing (VTD) Flare and 1 Ruhrstahl-Heraeus (RH) Flare);
- 24 silos for the storage of alloys;
- Ten (10) silos for the storage of lime, dolomite and bauxite;
- Eight (8) silos for the storage of direct reduced iron (DRI);
- Five (5) silos for the storage of flux injection materials;
- Four (4) silos for the storage of hot briquetted iron (HBI);

- Two (2) baghouse dust silos (BH);
- Scarfing Operations and associated electrostatic precipitator (ESP); and
- Road Dust from truck traffic

1.3 Regulatory Drivers and Modeling Applicability

Under the Clean Air Act, the federal land manager (FLM) and the federal official with direct responsibility for management of federal Class I areas have an affirmative responsibility to protect the AQRV of such lands and to consider whether a proposed major emitting facility may have an adverse impact on such values.[1] To provide better consistency in review of new source permit applications near federal Class I areas, the FLMs formed the Federal Land Manager's Air Quality Related Values Work Group (FLAG).

Air quality impacts on federally protected Class I areas must be assessed for projects meeting the criteria discussed in the FLM's FLAG Phase I Report–Revised (2010)[2] (herein, the "2010 FLAG Report") as described below:

> *Generally, the permitting authority should notify the FLM of all new or modified major facilities proposing to locate within 100 km (62 miles) of a Class I area. In addition, the permitting authority should notify the FLM of "very large sources" with the potential to affect Class I areas proposing to locate at distances greater than 100 km. (Reference March 19, 1979, memorandum from U.S. EPA Assistant Administrator for Air, Noise, and Radiation to Regional Administrators, Regions I-X). Given the multitude of possible size/distance combinations, the FLMs cannot precisely define in advance what constitutes a "very large source" located more than 100 km away that may impact a particular Class I area. However, as discussed elsewhere in this report, the Agencies have adopted a size (Q)/distance (D) criteria to screen out from AQRV review those sources with relatively small amounts of emissions located a large distance from a Class I area. Consequently, as a minimum, the permitting authority should notify the FLM of all sources that exceed these Q/D criteria.*

As set forth by the FLM, the Q/D analysis compares the ratio of the sum of proposed annualized maximum daily emission rates of all visibility impairing pollutants (in tons per year) and the distance to the nearest Class I area (in km) to a threshold value of 10.[3] The Class I area of interest for the Project is the Breton NWR, located at approximately 130 km from the Project Site, as summarized in Table 1-1.[4] The Sipsey Wilderness Area in Alabama was also analyzed, as it is the next closest Class I area to the Project Site. As shown in Table 1-2 and Appendix A, the Q/D analysis for this Class I area demonstrates that the threshold value of 10 is exceeded for Breton NWR but not for Sipsey Wilderness Area; therefore, a Class I area AQRV impact analysis will only be required for Breton NWR. AM/NS has

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1 U.S. Environmental Protection Agency. Notification to Federal Land Manager Under Section 165(d) of the Clean Air Act. Correspondence dated March 19, 1979. https://www.epa.gov/sites/production/files/2015-07/documents/fdlndmgr.pdf. Accessed June 2017.

2 National Park Service. Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report–Revised (2010). https://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG_2010.pdf. Accessed June 2017.

3 Per the 2010 FLAG Report, pp.18-19: "The Agencies will consider a source locating greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRVs if its total SO_2, NO_X, PM_{10}, and H_2SO_4 annual emissions (in tons per year, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less."

4 The distance from each federal Class I area has been calculated based on location information provided by Plaquemines LNG and Gator Express Pipeline.

communicated this information with the Sipsey Wilderness Area US Forest Service FLM to verify no Class I demonstration is needed.

Table 1-1 Location of the Project Relative to Class I Areas

Class I Area, State	Distance from Terminal Site to Class I Area (km)	Direction from Project Site to Class I Area	Federal Land Manager
Breton National Wildlife Refuge, LA (Breton NWR), LA	130.0	Southwest	U.S. Fish & Wildlife Service (FWS)
Sipsey Wilderness Area, AL	351.1	Northeast	U.S. Department of Agriculture Forest Service (USDA/FS)

Per the 2010 FLAG Report, the Q/D analysis must compare the ratio of the annualized 24-hour maximum allowable emissions of all visibility-impairing pollutants (in tons per year) and the distance to the nearest Federal Class I area (in km) to a threshold value of 10.[5] Table 1-2 shows the Q value calculated by the project emissions, the distance D used in the calculation, and the results of the Q/D calculation. The distance D is determined based on minimal distance between the middle point of the two Electric Arc Furnace stacks and the receptors in both Class I areas. The Q/D calculations are included in Appendix A.

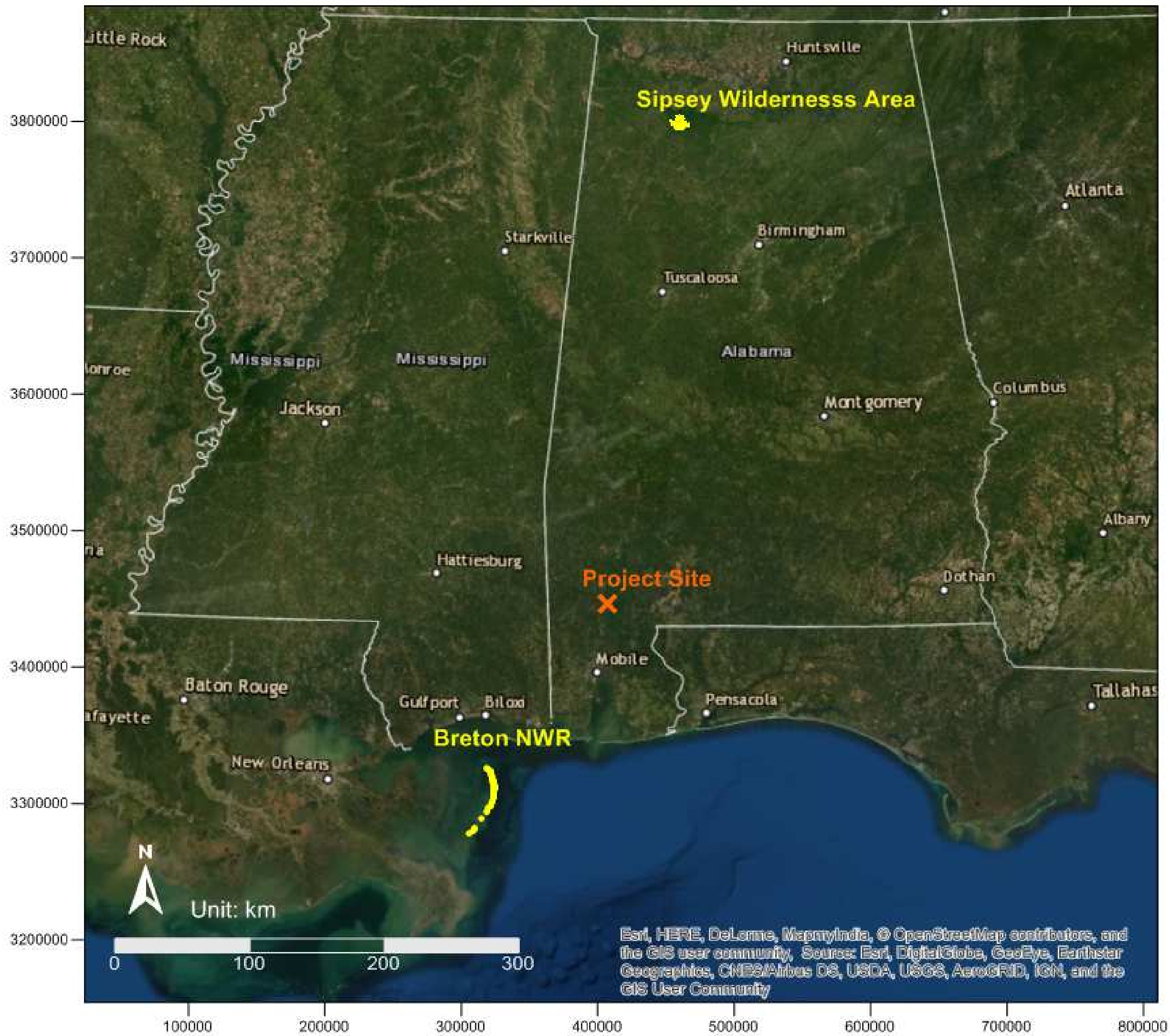
Table 1-2 Q/D Calculation for the Base Case AQRV Emissions Scenario

Class I Area, State	Emissions (Q) (tpy)	Distance (D) (km)	Q/D (tpy/km)
Breton National Wildlife Refuge, LA	2,712	130.0	20.9
Sipsey Wilderness Area, AL	2,712	351.1	7.7

A map showing the location of the Project relative to Breton NWR, the Sipsey Wilderness Area and surrounding onshore areas is provided in Figure 1-1.

5 2010 FLAG Report, p. 18.

Figure 1-1 Project Location and Class I Areas Map



2. MODELING ANALYSIS AND PROCEDURES

2.1 Model Selection

The 2010 FLAG Report specifies the use of the CALPUFF modeling system for AQRV analyses in Class I areas at distances greater than 50 km from the source under review. The previously approved EPA version (Version 5.8.5) of the CALPUFF model was used to assess the impacts of the Project's air emissions on AQRVs at Breton NWR.

CALPUFF is a multi-layer, multi-species, non-steady-state Lagrangian puff model, which can simulate the effects of time and space-varying meteorological conditions on pollutant transport, transformation, and removal. For this analysis, meteorological fields generated by CALMET were used as inputs to the CALPUFF model. Specifically, 4-km resolution CALMET data prepared for the Visibility Improvement State and Tribal Association of the Southeast[6] (VISTAS) for the period 2001-2003 were be used. Although the recently updated Guideline on Air Quality Models (Appendix W) no longer lists CALPUFF as a preferred model for long range transport, U.S. EPA does note in Sections 4.2 (c)(ii) and 4.2.1 (e) that Lagrangian dispersion models are appropriate for long range transport and that a Lagrangian model used for this purpose (Class I AQRV assessment) does not have to be approved as an alternative model. This report provides the methodologies that were used to utilize CALPUFF for the long range transport assessment related to Class I AQRVs. AM/NS asserts that the methodologies described in this report conform to best practices in that all recommendations in the 2010 FLAG Report are adhered to for the assessment of AQRVs. AM/NS also asserts that the use of meteorological data from VISTAS (that have an established record of acceptance for use in best available retrofit technology (BART) assessments and PSD air quality modeling analyses for Class I areas across the southeastern US by FLMs) is a best practice for this analysis and should be readily approvable by reviewing authorities in this case.

CALPUFF uses several other input files to specify source and receptor parameters. The selection and control of CALPUFF options are determined by user-specific inputs contained in the control file. This file contains all of the necessary information to define a model run (e.g., starting date, run length, grid specifications, technical options, output options). The air quality modeling that was performed using CALPUFF utilized default options unless otherwise noted, as specified in Appendix W, the 2010 FLAG Report, and the Interagency Workgroup on Air Quality Modeling (IWAQM) documents.[7] The following sections describe the modeling domain, meteorological data, background concentrations, and model implementation that was used for the analysis of the Project.

2.2 Modeled Stack Parameters

The stack parameters for emissions sources are based either on a pre-construction plot plan of the AM/NS facility or information provided by the engineering firms. The same stack parameters were used for all modeling runs (AQRV, and sensitivity runs), and a summary of the stack parameters used in the modeling analysis is presented in Appendix B.

2.3 Particulate Emissions Speciation For CALPUFF

Modeling of visibility impairment due to particulate matter emissions requires that the components of the exhaust stream be speciated because different sizes and phases of particulate matter affect visibility to varying extents. The amount by which a mass of a certain species scatters or absorbs light is termed the

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6 U.S. Environmental Protection Agency, "Visibility – Regional Planning Organizations". https://www.epa.gov/visibility/visibility-regional-planning-organizations. Accessed June 2017.

7 U.S. Environmental Protection Agency, "Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts". December 1998. https://www3.epa.gov/scram001/7thconf/calpuff/phase2.pdf. Accessed June 2017.

extinction efficiency or extinction coefficient, and varies considerably from coarse particulate matter to elemental carbon. Fine particulate matter and organic aerosols scatter light with intermediate efficiencies, and ammonium sulfate and ammonium nitrate (that form from precursor SO_2 and NO_X emissions in the presence of ambient ammonia) are hygroscopic species that scatter light efficiently in the presence of ambient water vapor. The particle size speciation used for all modeled source categories is presented in Table 2-1.

Table 2-1 Geometric Dimensions for PM Species

Species	Cumulative Mass Percent	Mass Fraction	Cumulative Mass Percent Corrected for PM10 [6]	Mass Fraction Corrected for PM10 [6]	Geometric Mass Mean Diameter (microns)
Electric Arc Furnace Melting[1]					
PM0050	74	74	97.4	97.4	0.5
PM0100	74	0	97.4	0.0	1
PM0250	74	0	97.4	0.0	2.5
PM0500	74	0	97.4	0.0	5
PM0600	74	0	97.4	0.0	6
PM1000	76	2	100	2.6	10
Cooling Tower[2]					
PM0050	0	0.0	0.0	0.0	0.5
PM0100	0	0.0	0.0	0.0	1
PM0250	0.21	0.2	0.3	0.3	2.5
PM0500	0.21	0.0	0.3	0.0	5
PM0600	0.21	0.0	0.3	0.0	6
PM1000	63.5	63.3	100	99.7	10
Mechanically Generated PM[3]					
PM0050	0	0	0.0	0.0	0.5
PM0100	4	4	7.8	7.8	1
PM0250	15	11	29.4	21.6	2.5
PM0500	30	15	58.8	29.4	5
PM0600	34	4	66.7	7.8	6
PM1000	51	17	100	33.3	10
Scarfing with ESP[4]					
PM0050	10	10	18.9	18.9	0.5
PM0100	21	11	39.6	20.8	1
PM0250	39	18	73.6	34.0	2.5
PM0500	47	8	88.7	15.1	5
PM0600	47	0	88.7	0.0	6
PM1000	53	6	100	11.3	10
Combustion[5]					
PM0050	0	0	0.0	0.0	0.5
PM0100	11	11	29.1	29.1	1
PM0250	29	18	57.0	27.8	2.5
PM0500	37	8	81.0	24.1	5
PM0600	37	0	88.6	7.6	6
PM1000	43	6	100	11.4	10

[1] Table 12.5-2, AP-42 Chapter 12.5: Iron and Steel Production (EAF)

[2] Calculting PM size distribution from Cooling Towers assuming 2,000 ppm TDS using the approach by Joel Reisman and Gordon Frisbie)
https://www.energy.ca.gov/sitingcases//palomar/documents/applicants_files/Data_Request_Response/Air%20Quality/Attachment%204-1.pdf

[3] Category 3, AP-42 Appendix B.2 Generalized Particle Size Distributions.

[4] Table 12.5-2, AP-42 Chapter 12.5: Iron and Steel Production (Open Hearth Furnace controlled by ESP)

[5] Category 2, AP-42 Appendix B.2 Generalized Particle Size Distributions.

[6] Fraction corrected based on PM10.

The average particle diameter for each non-default speciated PM category were taken as the geometric mass mean diameter for that category. Geometric standard deviation was assumed to be zero. Default CALPUFF values for geometric mass mean diameter (0.48 microns) and geometric standard deviation (2.0 microns) were used for sulfate and nitrate particles.

The speciated PM emissions were calculated using the size speciation and the PM_{10} emissions. For the emissions from EAF sources, direct sulfate (SO_4) and nitrate (NO_3) have been calculated using the analysis results by Yang et al.(4.6% SO_4 and 5.6% NO_3) [8]. The amount of SO_4 and NO_3 were then subtracted from the speciated PM10 emissions from the EAF sources. Appendix C summarizes the detailed emissions for the model input.

The PM emissions were categorized into different light extinction species: coarse particulate (PMC, all particulate between 2.5 and 10 microns in diameter), Inorganic Fine Particulate (SOIL, inorganic particulate less than 2.5 microns in diameter), Secondary Organic Aerosol (SOA), and Elemental Carbon. Table 2-2 lists the proportion of each of these extinction species as a percentage of the particle size species.

8 His-Hsien yang et al., "Emission Characteristics and Chemical Compositions of both Filterable and Condensable Fine Particulate from Steel Plants". Taiwan Association for Aerosol Research (http://aaqr.org/files/article/486/44_AAQR-15-06-OA-0398_1672-1680.pdf)

Table 2-2 Light Extinction Species

Species	PMC[1] (Extinction Coefficient: 0.6 Mm^{-1} per $\mu g/m^3$)	SOIL[2] (Extinction Coefficient: 1.0 Mm^{-1} per $\mu g/m^3$)	SOA[2] (Extinction Coefficient: 4 Mm^{-1} per $\mu g/m^3$)	EC[2] (Extinction Coefficient: 10 Mm^{-1} per $\mu g/m^3$)
PM0050	0.0%	34.4%	37.8%	27.8%
PM0100	0.0%	34.4%	37.8%	27.8%
PM0250	0.0%	34.4%	37.8%	27.8%
PM0500	100.0%	0.0%	0.0%	0.0%
PM0600	100.0%	0.0%	0.0%	0.0%
PM1000	100.0%	0.0%	0.0%	0.0%

[1] Assuming all PM larger than 2.5 mm contain 100% PMC.

[2] Assuming 25% EC in fine particles based on Particulate Matter Speciation (Gas-Fired Combustion Turbines) by National Park Service. https://nature.nps.gov/air/permits/ect/index.cfm. Accessed June 2017.
Total inorganic 41.1% (including 4.6% SO_4 and 5.6% NO_3 in fine particles, based on the research paper by Yang et al (http://aaqr.org/files/article/486/44_AAQR-15-06-OA-0398_1672-1680.pdf). The remaining 33.9% is assumed to be SOA. Since SO_4 and NO_3 are separate from PM in CALPUFF, SOIL, EC and SOA for fine particles are redistributed when SO_4 and NO_3 are excluded from PM. The PM speciation including and excluding SO4 and NO3 are summarized below.

PM speciation including SO4 and NO3		PM speciation excluding SO4 and NO3	
SOIL	30.9%	SOIL	34.4%
SO4	4.6%	SO4	0%
NO3	5.6%	NO3	0%
EC	25.0%	EC	27.8%
SOA	33.9%	SOA	37.8%
Total	100.0%	Total	100.0%

2.4 Modeling Domains

The Class I area modeling analysis has been performed in the Lambert Conformal Conic coordinate system based on the design of the VISTAS Regional Haze Rule[9] (RHR) modeling report, with standard parallels of 33º N and 45º N latitude, and reference latitude and longitude of 40º N and 97º W respectively. For CALPUFF to produce accurate results, the emissions sources and receptors must be located no less than 50 km from the domain edge. VISTAS RHR Model Domain 1 was utilized as the CALMET meteorological domain as the proposed emissions sources are located sufficiently within the model domain such that emitted puffs are not lost from the analysis. The different VISTAS RHR Model Domains are shown in Figure 2-1.

The horizontal domain is comprised of grid cells, each containing a central grid point at which meteorological and computational parameters are calculated at each time step. In Domain 1 of the VISTAS meteorological data, there are 116 X grid cells and 182 Y grid cells. The grid resolution is taken as 4 km. The computational domain is a subset of the CALMET meteorological domain. The X index of

9 40 C.F.R. Part 51, Subpart P. Regional Haze Regulations, 64 Fed. Reg. 35714 (July 1, 1999). https://www.gpo.gov/fdsys/pkg/FR-1999-07-01/pdf/99-13941.pdf. Accessed June 2017.

the lower left corner of the CALPUFF computational domain was set to 35, and the Y index of the lower left corner is 1. The X index of the upper right corner of the CALPUFF computational domain is 116 and the Y index of the upper right corner is 150. The computational domain was sized to ensure that the emissions sources and receptors are located more than 50 km from the domain edge while minimizing the model computational time.

Vertical grid structure is defined by the cell face height. The cell face height of each grid cell indicates its vertical extent. The vertical domain is composed of terrain-following grid cells, the number and size of which are chosen so as to constrain the boundary layer in which dispersion and chemical transformations take place. The vertical grid structure selected for this analysis is presented below in Table 2-3. The same cell face heights were used for both CALMET and CALPUFF.

Figure 2-1 VISTAS Domain Map

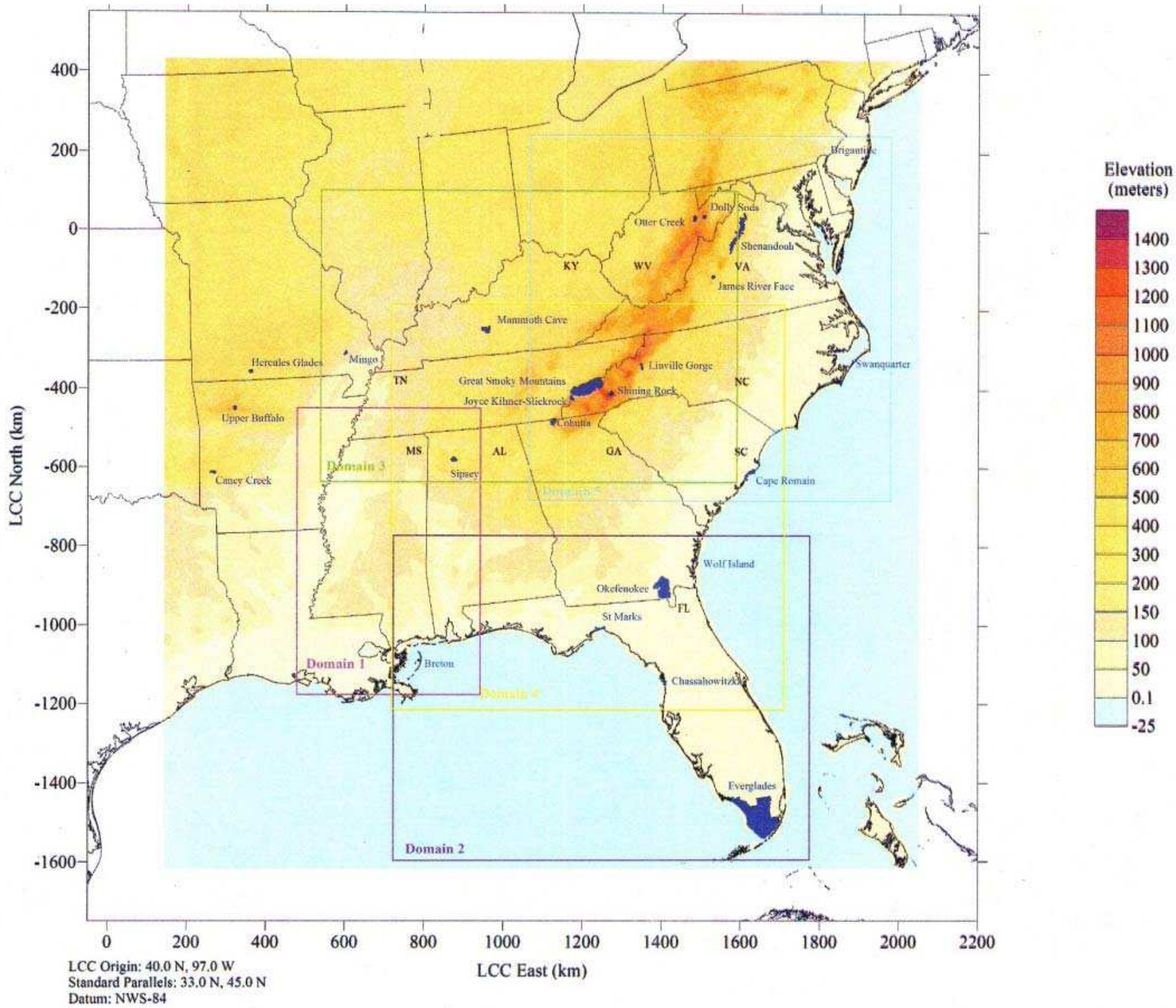

Table 2-3 Vertical Grid Structure

Vertical Grid Cell	Cell Face Height (meters)
1	0
2	20
3	40
4	80
5	160
6	320
7	640
8	1200
9	2000
10	3000
11	4000

2.5 Receptor Locations

The National Park Service (NPS) Air Resources Division has developed a database of modeling receptors for all federal Class I areas in the United States.[10] The database provides the location (latitude / longitude, decimal degrees) coordinates and elevation information for receptors for each Class I area. Receptor locations obtained from the database for Breton NWR were converted to the Lambert Conformal Conic coordinate system using the COORDS coordinate conversion program. Receptor locations as utilized in the model are presented in Appendix D for reference.

2.6 CALPUFF Model Processing

Using the three-dimensional meteorological data provided by CALMET, CALPUFF simulates the dispersion, deposition, and chemical transformation of discrete puffs of mass from emission sources. Each puff contains concentrations of NO_X, SO_2, nitrates, sulfates, and particulates and is advanced throughout the domain while deposition and chemical transformation processes take place. CALPUFF is a Lagrangian puff model, the principal advantages of which are that puffs can evolve dynamically and chemically over time and can respond to complex winds caused by terrain effects, stagnation, or recirculation.

The emissions data input into CALPUFF for sources modeled is discussed in Sections 2 and 3 of this Report. The visibility analysis were performed with the deposition and chemical transformation algorithms enabled.

A full resistance model is provided in CALPUFF for the computation of dry deposition rates of gases and particulate matter as a function of geophysical parameters, meteorological conditions, and pollutant species. An empirical scavenging coefficient approach using default options were enabled in CALPUFF to compute the depletion and wet deposition fluxes resulting from precipitation scavenging.

10 National Park Service. Class I Receptors. https://www.nature.nps.gov/air/maps/Receptors/index.cfm. Accessed June 2017.

The CALPUFF model is capable of simulating linear chemical transformation effects by using pseudo-first-order chemical reaction mechanisms for the conversions of SO_2 to SO_4, and NO_X, which consists of nitric oxide and nitrogen dioxide (NO_2), to NO_3 and HNO_3. In this analysis, chemical transformations involving five species (SO_2, SO_4, NO_X, HNO_3, and NO_3) were modeled.

In addition, two user-selected input parameters are available that affect the Lagrangian variable-trajectory puff- superposition model (MESOPUFF II) chemical transformation: ammonia concentrations and ozone concentrations. The selection of each parameter is discussed separately.

2.6.1 Ozone

Ambient ozone concentrations can be input to the model as a background level or using hourly, spatially varying observations. For this modeling analysis, data from the VISTAS Domain 1 Ozone background levels were used.

2.6.2 Ammonia

The IWAQM Phase 2 Summary Report[11] (IWAQM Guidance) recommends the use of spatially constant background ammonia concentrations to participate in the MESOPUFF II chemical transformation mechanism. In the absence of an extensive monitoring network for ammonia and because of the limitation of CALPUFF to simulate only a single, domain-average background ammonia level for each month of analysis, a single value was used. AM/NS used a default background concentration of 3 ppb for ammonia for this analysis.

2.6.3 CALPUFF Processing Control

CALPUFF modeling was conducted using the recommended regulatory default options specified in Appendix B of the IWAQM Guidance. The integrated puff representation was used, and puff splitting was disabled.

2.7 CALPOST Post processing analysis

The CALPOST post processor has been used to compute the ambient concentrations for assessment against the total deposition of sulfur and nitrogen within the Class I area for assessment against the DAT, and the 24-hour average change in light extinction using CALPOST Method 8.

For estimating the extent of nitrogen and sulfur deposition, a post processing package in CALPUFF (POSTUTIL) was utilized to combine the appropriate wet and dry fluxes of nitrogen- and sulfur-bearing species deposited as particles and gases. These combined fluxes were then processed using CALPOST to obtain the nitrogen and sulfur deposition values.

CALPOST Method 8 was used to determine 24-hr changes in visibility. The 98th percentile value for each year (i.e., the eighth highest value) was compared to the FLM recommended visibility level of 5 percent daily change.[12]

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11 U.S. Environmental Protection Agency. Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts. December 1998. https://www3.epa.gov/scram001/7thconf/calpuff/phase2.pdf. Accessed June 2017.

12 2010 FLAG Report, p. 23.

3. CLASS I VISIBILITY MODELING ANALYSIS APPROACH

Visibility can be affected by plume impairment or regional haze. Plume impairment results when there is a contrast or color difference between the plume and a viewed background (the sky or a terrain feature). Plume impairment is generally only of concern when the Class I area is near the proposed source (i.e., less than 50 km). In general, the near field visibility analysis is performed using VISCREEN or a model used for plume estimation (PLUVUE-II). For calculating the effect of a plume on visibility, a background visibility, expressed as a visual range (vr), must be input to these models.

Visual range can be related to extinction with the following equation using the light-extinction coefficient (b_{ext}):

$$b_{ext}(Mm^{-1}) = 3912/vr\ (Mm^{-1})$$

However, because the distance between the proposed project operations and the nearest Class I area is greater than 50 km, only regional haze is considered in this analysis.

Regional haze (uniform haze impairment) occurs at distances where the plume has become evenly dispersed into the atmosphere such that there is no definable plume. Most visibility impairment is in the form of regional haze. The primary causes of regional haze are sulfates (SO_4) and nitrates (NO_3) (primarily as ammonium salts), which are formed from emissions of SO_2 and NO_X through chemical reactions in the atmosphere. These reactions take time; hence, the distance of the puffs from the emissions source is important. For locations close to the emissions source, little NO_X or SO_2 forms nitrate or sulfate, whereas far from a source nearly all SO_2 forms sulfate and most NO_X forms nitrate. Particulate emissions also contribute to regional haze but to a lesser extent because sulfates and nitrates are hygroscopic species that increasingly reduce visibility with increased relative humidity.

Visibility degradation due to regional haze is measured using the b_{ext} and change in light extinction (Δb_{ext}). The b_{ext} is the attenuation of light per unit distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change that is measured by a visibility index called the deciview. The change in light extinction (Δb_{ext}) or delta-deciview (Δdv) is defined as the differences between background and predicted post-project light extinction coefficients.

$$\Delta b_{ext} = \Delta dv = (b_{exts} + b_{extb} - b_{extb}) / b_{extb}$$
$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

where: b_{exts} is the extinction coefficient calculated for the source, and
b_{extb} is the background extinction coefficient based on 20 percent best days.

Based on NPS guidance, if the change in extinction is less than 5 percent, no further analysis is required (2010 FLAG report). The visibility reduction attributable to a single facility that is generally acceptable to the FLM is a 5 percent increase in light extinction on a 24-hour average basis. There are a number of available methods that can be used to estimate the percentage change of light extinction coefficient associated with an emissions source. The peak 24-hour average visibility impairment as predicted by the air quality model is one conservative measure used to attribute visibility affects to a single source.

However, as stated in the preamble of the U.S. EPA's Regional Haze Regulations and Guidelines for BART Determinations, the CALPUFF model uses a simplified chemistry that "…tends to magnify the actual visibility effects" of a source (BART 2005).[13]

Therefore, the U.S. EPA recommends the consideration of the 98th percentile of modeled 24-hr visibility values per year to assess visibility impacts, and states in the preamble:[14]

> [W]e believe it is appropriate to use the 98th percentile—a more robust approach that does not give undue weight to the extreme tail of the distribution. The use of the 98th percentile of modeled visibility values would appear to exclude roughly 7 days per year from consideration. In our judgment, this approach effectively captures the sources that contribute to visibility impairment in a Class I area, while minimizing the likelihood that the highest modeled visibility impacts might be caused by unusual meteorology or conservative assumptions in the mode.

The use of the 98th percentile approach has also been formalized in the 2010 FLAG Report.

3.1 Background Extinction

As specified in the 2010 FLAG Report, the background extinction coefficient should be calculated using the IMPROVE equation for calculating light extinction.[15] The total background extinction coefficient was characterized using the annual average concentrations and Rayleigh scattering obtained from the 2010 FLAG report. The background values and Rayleigh scattering used in the visibility analyses for Breton NWR are summarized in Table 3-1 below.

Table 3-1 Background Concentrations – Breton NWR

Pollutant	Annual Average (μg/m^3)
Sulfate ($(NH_4)_2SO_4$)	0.23 μg/m^3
NH_4NO_3	0.10 μg/m^3
Organic Mass (OM)	1.78 μg/m^3
Elemental Carbon	0.02 μg/m^3
Soil	0.48 μg/m^3
Coarse Mass	3.01 μg/m^3
Sea Salt	0.19 μg/m^3
Rayleigh Scattering	11 Mm^{-1}

Monthly average relative humidity adjustment values for the Class I areas are shown in Table 3-2 as obtained from Table 7-9 of Section 3 of the 2010 FLAG Report.

13 40 C.F.R. Part 51, Subpart P. Regional Haze Regulations and Guidelines for BART Determinations; Final Rule, 70 Fed. Reg. 39104 (July 6, 2005). https://www.gpo.gov/fdsys/pkg/FR-2005-07-06/pdf/05-12526.pdf. Accessed June 2017.

14 70 Fed. Reg. 39104, at 39121.

15 2010 FLAG Report, p. 29.

Table 3-2 Relative Humidity Adjustment Factors – Breton NWR

Month	Small Sulfate Adjustment Factor	Large Sulfate Adjustment Factor	Sea Salt Adjustment Factor
January	4.08	2.91	4.10
February	3.82	2.76	3.89
March	3.79	2.74	3.87
April	3.74	2.72	3.85
May	3.94	2.83	4.02
June	4.12	2.94	4.21
July	4.41	3.10	4.44
August	4.37	3.07	4.38
September	4.18	2.97	4.23
October	3.92	2.82	3.99
November	3.93	2.83	4.01
December	4.06	2.90	4.11

4. CLASS I DEPOSITION MODELING ANALYSIS APPROACH

In the deposition analysis, the contribution of proposed project operations to the deposition of chemical species in the Class I area was evaluated against the deposition assessment threshold (DAT) values for sulfate and nitrate set by the FLM. The DAT represents *"the additional amount of N or S deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant."* The threshold is not necessarily an adverse impact threshold. FLM guidance for assessment of deposition impacts suggests that an appropriate sulfur and nitrogen DAT is 0.01 kg/ha/yr (each) for Class I areas in the Eastern United States.

The procedures specified in the 2010 FLAG Phase I Report has been used to model nitrogen and sulfur deposition. The total deposition is the sum of wet deposition and dry deposition.

For sulfur, both wet and dry fluxes of SO_2 and sulfates (SO_4) were modeled. Direct SO_4 emissions from the proposed project were very small but were included as a model input. Since SO_2 can chemically transform into SO_4 over time, wet and dry fluxes of both SO_2 and SO_4 were used to estimate sulfur deposition.

For nitrogen, the dry flux for NO_X, and wet and dry deposition fluxes for nitrates (NO_3), nitric acid (HNO_3), and ammonium ion (NH_4) from ammonium nitrate (NH_4NO_3) and ammonium sulfate $(NH_4)_2SO_4$ were modeled. In CALPUFF, NOx is weighed as NO_2, ammonium nitrate is weighed as NO_3, and ammonium sulfate is weighed as SO_4. Sulfate is assumed to contribute to N deposition as well as S deposition. The following describes the basis for the factors that were used in POSTUTIL for each species to calculate total sulfur and nitrogen deposition:

Total S deposition =	(32/64) x (total SO_2 deposition) +	*1 mole S in SO_2*
	(32/96) x (total SO_4 deposition)	*1 mole S in $(NH4)_2SO_4$*
Total N deposition =	(28/96) x (total SO_4 deposition) +	*2 moles of N in $(NH4)_2SO_4$*
	(14/46) x (total NO_x deposition) +	*1 mole of N in NO_x*
	(14/63) x (total HNO_3 deposition) +	*1 mole of N in HNO_3*
	(28/62) x (total NO_3 deposition) +	*2 moles of N in NH_4NO_3*

Based on the molar ratios described above, the following factors were applied to the modeled species in POSTUTIL to arrive at values of total sulfur (S) and nitrogen (N):

$$\text{Total Sulfur [S]} = 0.500000[SO_2] + 0.333333[SO_4]$$

$$\text{Total Nitrogen [N]} = 0.291667[SO_4] + 0.304348[NO_X] + 0.222222[HNO_3] + 0.451613[NO_3]$$

There are no HNO_3, $(NH_4)_2SO_4$, or $(NH_4)NO_3$ emissions from the proposed project, however, SO_2 and NO_X can chemically transform into SO_4 and NO_3 respectively over time, which in turn can form $(NH_4)_2SO_4$, $(NH_4)NO_3$, or HNO_3. Therefore, the dry flux of NO_X, and wet and dry fluxes of $(NH_4)_2SO_4$, (NH_4) NO_3, and HNO_3 were used to estimate nitrogen deposition.

In accordance with the 2010 FLAG report, gas phase deposition was modeled for SO_2, NO_X, and HNO_3, and particle phase deposition wasf modeled for SO_4 and NO_3. The contributions of the proposed project to the deposition of nitrogen and sulfur species in the Class I area were estimated as part of the modeling analysis, and were assessed against the appropriate DAT. Although the sulfur and nitrogen DATs are specified based on an annual averaging period, 24-hour maximum emission rates for the pollutants were conservatively modeled to estimate deposition impacts.

5. CLASS I VISIBILITY AND DEPOSITION RESULTS

A preliminary Class I visibility analysis was performed to determine if the proposed Project would have a significant impact on visibility at the Class I area. CALPOST Method 8 (Mode 5) were used to determine the potential impacts on visibility at Breton NWR. The worst-case 98th percentile 24-hour change in visibility due to emissions from the project was used to compare to a daily visibility significance level of 5 percent visibility change. The daily visibility change was assessed against existing visibility for Breton NWR that is based on annual average natural conditions. The visibility results from the visibility modeling analyses are shown in Table 5-1.

Table 5-1 Visibility Analysis Results from the Proposed Project – Average Annual Background

Year	Visibility Change from Project (% change)	FLM Threshold (% change)
2001	3.29	5
2002	2.44	5
2003	3.00	5

Based on the results shown in Table 5-1, emissions from the project at AM/NS would not have a significant impact on visibility in the Breton NWR.

Sulfur and nitrogen deposition analyses were performed to determine if the proposed facility could have a potential significant impact on sulfur and nitrogen deposition in Breton NWR. The total deposition (wet and dry fluxes) of sulfur dioxide (SO_2) and sulfate (SO_4) was used to determine the project sulfur (S) loading for comparison to the deposition analysis threshold (DAT)[16] for eastern Class I areas. Similarly, the total deposition (wet and dry fluxes) of nitrogen oxides (NO_X – dry deposition only), nitrate (NO_3), and nitric acid (HNO_3) was used to determine the project nitrogen (N) loading for comparison to the DAT for eastern Class I areas. The POSTUTIL post-processing utility program was used to sum the wet and dry deposition values from the hourly CALPUFF flux model output. The total S and N deposition flux ("loading"), in units of kilogram/(hectare-year) were then calculated through the CALPOST post-processing program.

The sulfur and nitrogen deposition results are shown in Table 5-2. The results shown in Table 5-2 demonstrate that the emissions from the project at AM/NS would not have a significant impact on the sulfur and nitrogen deposition in the Breton NWR.

16 Federal Land Managers' Interagency Guidance for Nitrogen and Sulfur Deposition Analyses, National Park Service, Natural Resource report NPS/NRSS/ARD/NRR – 2001/465, November 2011

Table 5-2 Sulfur and Nitrogen Deposition Analysis Results from the Proposed Project

Class I Area	Model Year	Species	Threshold Value (Kg/Ha/Yr)	Maximum Modeled Deposition (Kg/Ha/Yr)
Breton Wilderness Area	2001	Sulfate	0.01	0.0072
	2002			0.0051
	2003			0.0053
	2001	Nitrate	0.01	0.0012
	2002			0.0009
	2003			0.0005

APPENDIX A Q/D ANALYSES

Q/D CALCULATIONS

$$[H_2SO_4 + SO_2 + NO_x + PM_{10} \text{ emissions (tpy)}]/ \text{distance (km)} > 10$$

Project Emissions (Maximum Daily Annualized)

Pollutant	Maximum Daily Annualized (tpy)
Sulfuric Acid Mist (H_2SO_4)	0
Sulfur Dioxide (SO_2)	1,013.98
Nitrogen Oxides (NO_X)	1,025.82
Particulate Matter less than 10 microns (PM_{10})	672.50

Location of the Project Relative to Class I Areas

Class I Area, State	Distance from Terminal Site to Class I Area (km)	Direction from Terminal Site to Class I Area	Federal Land Manager
Breton National Wildlife Refuge, LA (Breton NWR), LA	130.0	Southwest	U.S. Fish & Wildlife Service (FWS)
Sipsey Wilderness Area, AL	351.1	Northeast	U.S. Department of Agriculture Forest Service (USDA/FS)

Breton NWR Q/D Analysis:

[0 tpy + 1,013.98 tpy + 1,025.82 tpy + 672.50 tpy] / 130.0 km = 20.9; 20.9 **> 10**

*Sipsey Q/D Analysis:**

[0 tpy + 1,013.98 tpy + 1,025.82 tpy + 672.50 tpy] / 351.1 km = 7.7; 7.7 **< 10**

APPENDIX B STACK PARAMETERS AND EMISSIONS

Table B-1 Stack Parameters of Point Sources

Modeling ID	Description	Source Type	UTM_E	UTM_N	LCC_Y	LCC_X	Base Elevation	Stack Height	Exit Temperature	Velocity	Stack Diameter
			m	m	km	km	m	m	K	m/s	m
EAF1	Electric Arc Furnace 1	Point	406,746.0	3,446,703.8	-938.47	860.22	14.9	61.00	391.48	23.03	6.50
EAF2	Electric Arc Furnace 2	Point	406,755.4	3,446,673.6	-938.50	860.24	14.9	61.00	391.48	23.03	6.50
CT1	Cooling Tower 1	Point	406,601.4	3,446,809.9	-938.38	860.07	14.9	9.14	305.37	12.19	9.14
CT2	Cooling Tower 2	Point	406,716.0	3,446,736.8	-938.44	860.19	14.9	9.14	305.37	12.19	9.14
DEGAS_1	Degasser Flare 1	Point	406,785.7	3,446,960.6	-938.23	860.37	14.9	50.37	1273.00	20.00	0.40
DEGAS_2	Degasser Flare 2	Point	406,887.2	3,446,917.8	-938.22	860.20	14.9	54.69	1273.00	20.00	0.30
ALLOY01	Silo 1	Point	407,021.7	3,446,747.0	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY02	Silo 2	Point	407,019.8	3,446,745.0	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY03	Silo 3	Point	407,017.7	3,446,743.0	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY04	Silo 4	Point	407,015.7	3,446,741.1	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY05	Silo 5	Point	407,013.6	3,446,739.1	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY06	Silo 6	Point	407,011.7	3,446,737.2	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY07	Silo 7	Point	407,019.6	3,446,749.1	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY08	Silo 8	Point	407,017.6	3,446,747.2	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY09	Silo 9	Point	407,015.6	3,446,745.2	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY10	Silo 10	Point	407,013.6	3,446,743.3	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY11	Silo 11	Point	407,011.5	3,446,741.3	-938.41	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY12	Silo 12	Point	407,009.5	3,446,739.4	-938.41	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY13	Silo 13	Point	407,015.4	3,446,753.5	-938.39	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY14	Silo 14	Point	407,013.4	3,446,751.6	-938.40	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY15	Silo 15	Point	407,011.3	3,446,749.6	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY16	Silo 16	Point	407,009.3	3,446,747.7	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY17	Silo 17	Point	407,007.3	3,446,745.7	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY18	Silo 18	Point	407,005.3	3,446,743.8	-938.41	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY19	Silo 19	Point	407,013.2	3,446,755.7	-938.39	860.49	14.9	18.14	298.15	0.11	1.03
ALLOY20	Silo 20	Point	407,011.3	3,446,753.8	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY21	Silo 21	Point	407,009.2	3,446,751.8	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY22	Silo 22	Point	407,007.2	3,446,749.9	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY23	Silo 23	Point	407,005.1	3,446,747.9	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
ALLOY24	Silo 24	Point	407,003.2	3,446,745.9	-938.40	860.48	14.9	18.14	298.15	0.11	1.03
BH01	BH Silo 1	Point	406,776.1	3,446,711.2	-938.46	860.25	14.9	18.29	298.15	0.51	1.03
BH02	BH Silo 2	Point	406,783.1	3,446,717.9	-938.46	860.26	14.9	18.29	298.15	0.51	1.03

Table B-1 Stack Parameters of Point Sources

Modeling ID	Description	Source Type	UTM_E	UTM_N	LCC_Y	LCC_X	Base Elevation	Stack Height	Exit Temperature	Velocity	Stack Diameter
DRI01	DRI Silo 1	Point	407,087.4	3,446,800.7	-938.34	860.55	14.9	27.43	298.15	0.45	1.03
DRI02	DRI Silo 2	Point	407,072.1	3,446,785.8	-938.36	860.54	14.9	27.43	298.15	0.45	1.03
DRI03	DRI Silo 3	Point	407,056.8	3,446,771.0	-938.37	860.53	14.9	27.43	298.15	0.45	1.03
DRI04	DRI Silo 4	Point	407,041.5	3,446,756.1	-938.39	860.51	14.9	27.43	298.15	0.45	1.03
DRI05	DRI Silo 5	Point	407,072.6	3,446,816.0	-938.33	860.54	14.9	27.43	298.15	0.45	1.03
DRI06	DRI Silo 6	Point	407,057.3	3,446,801.1	-938.34	860.52	14.9	27.43	298.15	0.45	1.03
DRI07	DRI Silo 7	Point	407,042.0	3,446,786.3	-938.36	860.51	14.9	27.43	298.15	0.45	1.03
DRI08	DRI Silo 8	Point	407,026.7	3,446,771.4	-938.38	860.50	14.9	27.43	298.15	0.45	1.03
LIME01	LDB Silo 1	Point	407,032.6	3,446,738.4	-938.41	860.51	14.9	32.80	298.15	0.11	1.03
LIME02	LDB Silo 2	Point	407,029.8	3,446,735.7	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME03	LDB Silo 3	Point	407,026.9	3,446,732.9	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME04	LDB Silo 4	Point	407,024.1	3,446,730.1	-938.42	860.50	14.9	32.80	298.15	0.11	1.03
LIME05	LDB Silo 5	Point	407,021.2	3,446,727.4	-938.42	860.50	14.9	32.80	298.15	0.11	1.03
LIME06	LDB Silo 6	Point	407,029.9	3,446,741.3	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME07	LDB Silo 7	Point	407,027.0	3,446,738.5	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME08	LDB Silo 8	Point	407,024.2	3,446,735.7	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME09	LDB Silo 9	Point	407,021.3	3,446,733.0	-938.41	860.50	14.9	32.80	298.15	0.11	1.03
LIME10	LDB Silo 10	Point	407,018.5	3,446,730.2	-938.42	860.49	14.9	32.80	298.15	0.11	1.03
INJECT01	Flux Silo 1	Point	406,986.7	3,446,739.7	-938.41	860.46	14.9	17.25	298.15	0.11	1.03
INJECT02	Flux Silo 2	Point	406,981.7	3,446,744.9	-938.41	860.45	14.9	17.25	298.15	0.11	1.03
INJECT03	Flux Silo 3	Point	406,976.8	3,446,750.0	-938.40	860.45	14.9	17.25	298.15	0.11	1.03
INJECT04	Flux Silo 4	Point	406,972.2	3,446,754.7	-938.40	860.44	14.9	17.25	298.15	0.11	1.03
INJECT05	Flux Silo 5	Point	406,966.9	3,446,760.1	-938.39	860.44	14.9	17.25	298.15	0.11	1.03
HBI01	HBI Silo 1	Point	407,039.6	3,446,733.0	-938.41	860.51	14.9	15.54	298.15	0.45	1.03
HBI02	HBI Silo 2	Point	407,037.8	3,446,731.3	-938.41	860.51	14.9	15.54	298.15	0.45	1.03
HBI03	HBI Silo 3	Point	407,033.9	3,446,727.5	-938.42	860.51	14.9	15.54	298.15	0.45	1.03
HBI04	HBI Silo 4	Point	407,032.1	3,446,725.8	-938.42	860.51	14.9	15.54	298.15	0.45	1.03
CAST_1	Contact Water Stack 1	Point	406,862.7	3,446,973.9	-938.19	860.31	14.9	51.37	333.15	42.28	1.42
CAST_2	Contact Water Stack 2	Point	406,831.0	3,447,008.9	-938.16	860.28	14.9	51.37	333.15	42.28	1.42
ESP	Scarfing ESP	Point	406,920.4	3,447,158.3	-938.00	860.35	14.9	65.00	333.15	20.00	2.20

Table B-2 Emissions from Point Sources

Modeling ID	Description	Source Type	SO_2 Emissions	NOx Emissions	PM_{10} Emissions
			g/s	g/s	g/s
EAF1	Electric Arc Furnace 1	Point	14.58	14.58	7.82
EAF2	Electric Arc Furnace 2	Point	14.58	14.58	7.82
CT1	Cooling Tower 1	Point	0.00	0.00	0.00400
CT2	Cooling Tower 2	Point	0.00	0.00	0.00400
DEGAS_1	Degasser Flare 1	Point	0.00	0.19	0.04172
DEGAS_1	Degasser Flare 1	Point	0.00115	0.1921	0.0417
DEGAS_2	Degasser Flare 2	Point	0.00039	0.0643	0.0320
ALLOY01	Silo 1	Point	0.00	0.00	0.00108
ALLOY02	Silo 2	Point	0.00	0.00	0.00108
ALLOY03	Silo 3	Point	0.00	0.00	0.00108
ALLOY04	Silo 4	Point	0.00	0.00	0.00108
ALLOY05	Silo 5	Point	0.00	0.00	0.00108
ALLOY06	Silo 6	Point	0.00	0.00	0.00108
ALLOY07	Silo 7	Point	0.00	0.00	0.00108
ALLOY08	Silo 8	Point	0.00	0.00	0.00108
ALLOY09	Silo 9	Point	0.00	0.00	0.00108
ALLOY10	Silo 10	Point	0.00	0.00	0.00108
ALLOY11	Silo 11	Point	0.00	0.00	0.00108
ALLOY12	Silo 12	Point	0.00	0.00	0.00108
ALLOY13	Silo 13	Point	0.00	0.00	0.00108
ALLOY14	Silo 14	Point	0.00	0.00	0.00108
ALLOY15	Silo 15	Point	0.00	0.00	0.00108
ALLOY16	Silo 16	Point	0.00	0.00	0.00108
ALLOY17	Silo 17	Point	0.00	0.00	0.00108
ALLOY18	Silo 18	Point	0.00	0.00	0.00108
ALLOY19	Silo 19	Point	0.00	0.00	0.00108
ALLOY20	Silo 20	Point	0.00	0.00	0.00108
ALLOY21	Silo 21	Point	0.00	0.00	0.00108
ALLOY22	Silo 22	Point	0.00	0.00	0.00108
ALLOY23	Silo 23	Point	0.00	0.00	0.00108
ALLOY24	Silo 24	Point	0.00	0.00	0.00108
BH01	BH Silo 1	Point	0.00	0.00	0.00483

Table B-2 Emissions from Point Sources

Modeling ID	Description	Source Type	SO_2 Emissions	NOx Emissions	PM_{10} Emissions
BH02	BH Silo 2	Point	0.00	0.00	0.00483
DRI02	DRI Silo 2	Point	0.00	0.00	0.00432
DRI03	DRI Silo 3	Point	0.00	0.00	0.00432
DRI04	DRI Silo 4	Point	0.00	0.00	0.00432
DRI05	DRI Silo 5	Point	0.00	0.00	0.00432
DRI06	DRI Silo 6	Point	0.00	0.00	0.00432
DRI07	DRI Silo 7	Point	0.00	0.00	0.00432
DRI08	DRI Silo 8	Point	0.00	0.00	0.00432
LIME01	LDB Silo 1	Point	0.00	0.00	0.00108
LIME02	LDB Silo 2	Point	0.00	0.00	0.00108
LIME03	LDB Silo 3	Point	0.00	0.00	0.00108
LIME04	LDB Silo 4	Point	0.00	0.00	0.00108
LIME05	LDB Silo 5	Point	0.00	0.00	0.00108
LIME06	LDB Silo 6	Point	0.00	0.00	0.00108
LIME07	LDB Silo 7	Point	0.00	0.00	0.00108
LIME08	LDB Silo 8	Point	0.00	0.00	0.00108
LIME09	LDB Silo 9	Point	0.00	0.00	0.00108
LIME10	LDB Silo 10	Point	0.00	0.00	0.00108
INJECT01	Flux Silo 1	Point	0.00	0.00	0.00108
INJECT02	Flux Silo 2	Point	0.00	0.00	0.00108
INJECT03	Flux Silo 3	Point	0.00	0.00	0.00108
INJECT04	Flux Silo 4	Point	0.00	0.00	0.00108
INJECT05	Flux Silo 5	Point	0.00	0.00	0.00108
HBI01	HBI Silo 1	Point	0.00	0.00	0.00432
HBI02	HBI Silo 2	Point	0.00	0.00	0.00432
HBI03	HBI Silo 3	Point	0.00	0.00	0.00432
HBI04	HBI Silo 4	Point	0.00	0.00	0.00432
CAST_1	Contact Water Stack 1	Point	0.00	0.00	0.433
CAST_2	Contact Water Stack 2	Point	0.00	0.00	0.433
ESP	Scarfing ESP	Point	0.00	0.04	1.935

Table B-3 Stack Parameters of Area Sources

Modeling ID	Description	Source Type	Base Elevation	Area	Effective Height	Sigma Z
			m	m^2	m	m
SLGH	Slag Handling	Area	14.9	14233	3.0	0.00
SLGD	Slag Drop	Area	14.9	14233	3.0	0.00
SP_MT	Storage Piles & Material Transfer	Area	14.9	80349	3.0	0.00
IA_ST	Insignificant Activity - Scrap Torching	Area	14.9	26.7	2.0	0.00
IA_SC	Insignificant Activity - Slab Cutting	Area	14.9	26.7	2.0	0.00
Truck	Truck Traffic	Area	14.9	16105778	3.0	0.00

Table B-4 Stack Locations of Area Sources

Modeling ID	Description	Source Type	LCC X1	LCC X2	LCC X3	LCC X4	LCC Y1	LCC Y2	LCC Y3	LCC Y4
			km	km	km	km	km	km	km	km
SLGH	Slag Handling	Area	860.110	860.229	860.290	860.167	-938.317	-938.423	-938.352	-938.252
SLGD	Slag Drop	Area	860.110	860.229	860.290	860.167	-938.317	-938.423	-938.352	-938.252
SP_MT	Storage Piles & Material Transfer	Area	860.110	860.229	860.290	860.167	-938.317	-938.423	-938.352	-938.252
IA_ST	Insignificant Activity - Scrap Torching	Area	860.188	860.191	860.196	860.193	-938.330	-938.327	-938.333	-938.335
IA_SC	Insignificant Activity - Slab Cutting	Area	860.188	860.191	860.196	860.193	-938.330	-938.327	-938.333	-938.335
Truck	Truck Traffic	Area	857.322	860.914	861.413	857.812	-937.746	-937.338	-941.858	-942.257

Table B-5 Emissions from Area Sources

Modeling ID	Description	Source Type	SO_2 Emissions	NOx Emissions	PM_{10} Emissions
			$g/s/m^2$	$g/s/m^2$	$g/s/m^2$
SLGH	Slag Handling	Area	0.00	0.00	1.05E-06
SLGD	Slag Drop	Area	0.00	0.00	1.58E-07
SP_MT	Storage Piles & Material Transfer	Area	0.00	0.00	6.19E-06
IA_ST	Insignificant Activity - Scrap Torching	Area	1.89E-06	2.83E-04	3.05E-04
IA_SC	Insignificant Activity - Slab Cutting	Area	9.20E-08	1.50E-05	2.85E-07
Truck	Truck Traffic	Area	0.00E+00	0.00E+00	1.16E-08

APPENDIX C PM10 EMISSIONS PARTICLE SIZE DISTRIBUTION

Table C-1 Emissions from Point Sources

Modeling ID	Emissions (g/s)								
	SO4	NO3	PM0050	PM0100	PM0250	PM0500	PM0600	PM1000	Total PM10
EAF1	0.34	0.41	6.88	0	0	0	0	0.1859	7.82
EAF2	0.34	0.41	6.88	0	0	0	0	0.1859	7.82
CT1	0	0	0	0	1.324E-05	0	0	0.0040	0.0040
CT2	0	0	0	0	1.324E-05	0	0	0.0040	0.0040
DEGAS_1	0	0	0	0.0032722	0.0089984	0.01227	0.00327	0.0139	0.042
DEGAS_2	0	0	0	0.0025102	0.0069031	0.00941	0.00251	0.0107	0.032
SILO_1	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_2	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_3	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_4	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_5	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_6	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_7	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_8	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_9	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_10	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_11	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_12	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_13	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_14	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_15	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_16	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_17	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_18	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_19	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_20	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_21	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_22	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_23	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
SILO_24	0	0	0	8.471E-05	0.0002329	0.00032	8.5E-05	0.0004	0.0011
BH01	0	0	0	0.0003791	0.0010424	0.00142	0.00038	0.0016	0.0048
BH02	0	0	0	0.0003791	0.0010424	0.00142	0.00038	0.0016	0.0048

Table C-2 Emissions from Area Sources

Modeling ID	Emissions (g/s/m²)								
	SO4	NO3	PM0050	PM0100	PM0250	PM0500	PM0600	PM1000	Total PM10
SLGH	0.00	0.00	0.00	8.26E-08	2.27E-07	3.10E-07	8.26E-08	3.51E-07	1.05E-06
SLGD	0.00	0.00	0.00	1.24E-08	3.40E-08	4.64E-08	1.24E-08	5.26E-08	1.58E-07
SP_MT	0.00	0.00	0.00	4.86E-07	1.34E-06	1.82E-06	4.86E-07	2.06E-06	6.19E-06
IA_ST	0.00	0.00	0.00	1.52E-04	1.52E-04	0.00	0.00	0.00	3.05E-04
IA_SC	0.00	0.00	0.00	1.42E-04	1.42E-04	0.00	0.00	0.00	2.83E-04
Truck	0.00	0.00	0.00	9.09E-10	2.50E-09	3.41E-09	9.09E-10	3.86E-09	1.16E-08

APPENDIX D BRETON NATIONAL WILDLIFE REFUGE – RECEPTOR INFORMATION

Receptor ID	Latitude (N) (deg)	Longitude (W) (deg)	Elevation (m)	Height (m)
Bret1	29.621	89.004	0	0
Bret2	29.637	88.979	0	0
Bret3	29.646	88.971	0	0
Bret4	29.654	88.963	0	0
Bret5	29.721	88.913	0	0
Bret6	29.762	88.871	0	0
Bret7	29.787	88.863	0	0
Bret8	29.804	88.846	1	0
Bret9	29.812	88.846	1	0
Bret10	29.829	88.838	1	0
Bret11	29.837	88.838	1	0
Bret12	29.854	88.829	1	0
Bret13	29.862	88.829	1	0
Bret14	29.871	88.829	1	0
Bret15	29.879	88.829	1	0
Bret16	29.887	88.829	0	0
Bret17	29.896	88.829	0	0
Bret18	29.912	88.829	0	0
Bret19	29.912	88.821	1	0
Bret20	29.921	88.821	1	0
Bret21	29.929	88.829	0	0
Bret22	29.929	88.821	1	0
Bret23	29.937	88.829	0	0
Bret24	29.937	88.821	1	0
Bret25	29.946	88.829	1	0
Bret26	29.954	88.829	1	0
Bret27	29.962	88.838	0	0
Bret28	29.962	88.829	1	0
Bret29	29.971	88.838	0	0
Bret30	29.971	88.829	1	0
Bret31	29.979	88.838	0	0
Bret32	29.987	88.838	0	0
Bret33	29.996	88.838	1	0

Bret34	30.004	88.846	0	0
Bret35	30.012	88.846	0	0
Bret36	30.021	88.854	0	0
Bret37	30.029	88.854	1	0
Bret38	30.037	88.863	0	0
Bret39	30.046	88.871	0	0
Bret40	30.054	88.879	0	0

APPENDIX E CLASS I AQRV MODELING PROTOCOL CORRESPONDENCE LOG

From: Joe Gross
To: Collins, Catherine; tim_allen@fws.gov
Cc: Tom Wickstrom; Robert Pinckard (robert.pinckard@arcelormittal.com); Stewart, Steven D; Vikram Kashyap
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Monday, January 13, 2020 9:54:00 AM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Good Morning Catherine and Tim,

AM/NS Calvert, LLC (AM/NS) owns and operates a carbon steel mill located in Calvert, Alabama. The Title V permit was issued by the Alabama Department of Environmental Management (ADEM) on February 24, 2015 (Permit Number 503-0095).

On behalf of AM/NS, attached for your review is the electronic copy of the Class I Air Modeling Protocol in support of a proposed PSD project.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Engineer

ERM
3838 N. Causeway Blvd. Suite 3000
Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
To: Collins, Catherine; tim_allen@fws.gov
Cc: Tom Wickstrom
Subject: RE: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Friday, January 31, 2020 8:54:00 AM
Attachments: image001.png

Good Morning Catherine and Tim,

Happy Friday!

I wanted to follow up on the email below to see how your review was going.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Good Morning Catherine and Tim,

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On behalf of AM/NS, attached for your review is the electronic copy of the Class I Air Modeling

Protocol in support of a proposed PSD project.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Engineer

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Metairie, Louisiana 70002

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From: Joe Gross
To: Collins, Catherine; tim_allen@fws.gov
Cc: Tom Wickstrom; Robert Pinckard (robert.pinckard@arcelormittal.com)
Subject: RE: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Thursday, February 20, 2020 3:38:00 PM
Attachments: image001.png

Good Afternoon Catherine and Tim,

I wanted to follow up with you on the protocol we had sent over and see if there were any questions or concerns.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
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From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
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Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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E Joe.Gross@erm.com | **W** www.erm.com

From:	Joe Gross
To:	Collins, Catherine
Cc:	tim_allen@fws.gov; Tom Wickstrom
Subject:	FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date:	Thursday, March 5, 2020 10:43:00 AM
Attachments:	image001.png 25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

---

Hi Catherine,

I wanted to follow up with you on our call last week and see when we should expect to hear back regarding the Class I protocol we had submitted (email below and attached).

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Metairie, Louisiana 70002

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E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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Best Regards,

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E Joe.Gross@erm.com | **W** www.erm.com

From:	Joe Gross
To:	Collins, Catherine
Subject:	FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date:	Wednesday, March 11, 2020 2:32:00 PM
Attachments:	image001.png 25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Good Afternoon Catherine,

I didn't see an email from you and wanted to follow up on our call yesterday, and see when we should be expecting to hear back from you.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Thursday, March 5, 2020 10:44 AM
To: Collins, Catherine <catherine_collins@fws.gov>
Cc: tim_allen@fws.gov; Tom Wickstrom <Tom.Wickstrom@erm.com>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Hi Catherine,

I wanted to follow up with you on our call last week and see when we should expect to hear back regarding the Class I protocol we had submitted (email below and attached).

Best Regards,

Joe Gross
Senior Consultant - Engineering

ERM

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Metairie, Louisiana 70002

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From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
Subject: AM/NS Calvert, LLC - Class I Air Modeling Protocol

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From: Joe Gross
To: Collins, Catherine
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Wednesday, March 25, 2020 2:55:00 PM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

I wanted to follow up with you on our protocol.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Metairie, Louisiana 70002

T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Wednesday, March 11, 2020 2:33 PM
To: Collins, Catherine <catherine_collins@fws.gov>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Good Afternoon Catherine,

I didn't see an email from you and wanted to follow up on our call yesterday, and see when we should be expecting to hear back from you.

Please let me know if you have any questions or would like to discuss.

Best Regards,

Joe Gross
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T 504 846 9214 **| M** 504 617 0184
E Joe.Gross@erm.com **| W** www.erm.com

From: Joe Gross
Sent: Thursday, March 5, 2020 10:44 AM
To: Collins, Catherine <catherine_collins@fws.gov>
Cc: tim_allen@fws.gov; Tom Wickstrom <Tom.Wickstrom@erm.com>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Hi Catherine,

I wanted to follow up with you on our call last week and see when we should expect to hear back regarding the Class I protocol we had submitted (email below and attached).

Best Regards,

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To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
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E Joe.Gross@erm.com | **W** www.erm.com

From:	Joe Gross
To:	Collins, Catherine
Cc:	Robert Pinckard (robert.pinckard@arcelormittal.com)
Subject:	FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date:	Monday, March 30, 2020 2:06:00 PM
Attachments:	image001.png 25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

I wanted to follow up with you regarding the Class I protocol. Please let me know if we are good to proceed as discussed in the protocol or if you have any questions or comments.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
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Metairie, Louisiana 70002

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E Joe.Gross@erm.com | **W** www.erm.com

From:	Joe Gross
To:	Collins, Catherine
Subject:	FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date:	Monday, April 20, 2020 1:44:00 PM
Attachments:	image001.png 25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

Just wanted to follow up on our protocol.

Best Regards,
Joe Gross
Senior Consultant - Engineering
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Metairie, Louisiana 70002
T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, March 30, 2020 2:07 PM
To: Collins, Catherine <catherine_collins@fws.gov>
Cc: Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Hi Catherine,

I wanted to follow up with you regarding the Class I protocol. Please let me know if we are good to proceed as discussed in the protocol or if you have any questions or comments.

Best Regards,
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E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, January 13, 2020 9:54 AM
To: Collins, Catherine <catherine_collins@fws.gov>; tim_allen@fws.gov
Cc: Tom Wickstrom <Tom.Wickstrom@erm.com>; Robert Pinckard (robert.pinckard@arcelormittal.com) <robert.pinckard@arcelormittal.com>; Stewart, Steven D <steven.stewart@arcelormittal.com>; Vikram Kashyap <Vikram.Kashyap@erm.com>
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From: Joe Gross
To: Collins, Catherine
Cc: Robert Pinckard (robert.pinckard@arcelormittal.com); Owen, Jim; Tom Wickstrom; tim_allen@fws.gov
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol
Date: Friday, May 15, 2020 10:37:00 AM
Attachments: image001.png
25614Mrpt_AMNS_Class_I_protocol_v1.0.pdf

Hi Catherine,

I wanted to keep this fresh in your inbox. We are still waiting on your approval for our Class I Air Modeling Protocol.

Best Regards,

Joe Gross
Senior Consultant - Engineering
ERM
3838 N. Causeway Blvd. Suite 3000
Metairie, Louisiana 70002
T 504 846 9214 | **M** 504 617 0184
E Joe.Gross@erm.com | **W** www.erm.com

From: Joe Gross
Sent: Monday, April 20, 2020 1:45 PM
To: Collins, Catherine <catherine_collins@fws.gov>
Subject: FW: AM/NS Calvert, LLC - Class I Air Modeling Protocol

Hi Catherine,

Just wanted to follow up on our protocol.

Best Regards,

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New Zealand
Panama
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ERM

- 24-hour PM_{10} (NAAQS and PSD increment);
- Annual PM_{10} (PSD increment);
- 24-hour $PM_{2.5}$ (NAAQS and PSD increment); and
- Annual $PM_{2.5}$ (NAAQS and PSD increment).

The SIA is the extent of the receptors for each respective pollutant and averaging period that are over the SIL. Table 10-1 also lists the distance to the furthest receptor for each triggered SIA. Aside from 1-hour NO_2 and 1-hour SO2, all the Airport runs over the SIL had a furthest extend at 6.5 km. The SIA for 1-hour NO_2 and SO_2 extends out to 13.9 km.

For the SIL modeling using the Site meteorology, the following pollutant/averaging periods required full cumulative modeling as the project's impacts were higher than the SIL, they are:

- 1-hour NO_2 (NAAQS);
- 1-hour SO_2 (NAAQS);
- 24-hour SO_2 (PSD increment);
- 24-hour PM_{10} (NAAQS and PSD increment);
- Annual PM_{10} (PSD increment);
- 24-hour $PM_{2.5}$ (NAAQS and PSD increment); and
- Annual $PM_{2.5}$ (NAAQS and PSD increment).

The SIA is the extent of the receptors for each respective pollutant and averaging period that are over the SIL. Table 10-1 also lists the distance to the furthest receptor for each triggered SIA. All the Site runs over the SIL had a furthest extend under 7 km. The SIA for 1-hour NO_2 extends out to 13.9 km, the 1-hour SO_2 SIA extends out to 14.4 km.

The $PM_{2.5}$ averaging periods require a slightly different methodology to determine the SIA receptor grid than the methodology determining the requirement of a $PM_{2.5}$ NAAQS analysis. The annual $PM_{2.5}$ PSD increment SIL methodology uses the maximum annual value for each of the five (5) years separately whereas the NAAQS SIL analysis averages the maximum annual averages over the five (5) years. Similarly the 24-hour PSD increment SIL is based on the overall H1H of the 24-hour predicted impacts versus taking the 5-year average of the 24-hour averages.

10.2 Significant Monitoring Concentrations

The maximum concentrations from the project were compared against the applicable monitoring *de minimis* concentration or SMC. All criteria pollutants with SILs had predicted H1H impacts from the project less than their respective SMC. As noted previously, there is no SIL defined for lead. However, since the lead emissions for the project were over the SER, lead modeling was required. To assess the project's impact, the lead emissions were modeled for the project-only over the entire 10 km receptor grid. AERMOD was run for the monthly averaging period with an output "post-file" that recorded all the predicted ground concentrations for every receptor, for every month over the five year modeling period. For each of the meteorological datasets Pb runs, the resultant post-file was then input into the USEPA's

Table 10-1 Significant Impact Level (SIL) and Significant Monitoring Concentration (SMC) Analysis

Pollutant	Averaging Period	SIL (µg/m³)	Significant Monitoring Concentration (µg/m³)	AIRPORT		SITE	
				Max H1H (µg/m³)	SIA (km)	Max H1H (µg/m³)	SIA (km)
CO	1-hour[a]	2000	--	211.21	-	190.94	-
	8-hour[a]	500	575	134.10	-	150.39	-
Pb	Month[b]	--	1.0E-01	4.98E-03	-	5.26E-03	-
NO_2	1-hour[c]	7.5	--	20.91	13.9	22.28	13.9
	Annual[d]	1	14	0.42	-	0.40	-
PM_{10}	24-hour[a]	5	10	8.84	1.7	8.86	1.6
	Annual[d]	1	--	1.57	0.9	1.51	0.9
$PM_{2.5}$	24-hour[e]	1.2	--	8.06	6.5	7.79	6.4
	Annual [f]	0.2	--	1.41	3.5	1.38	3.2
SO_2	1-hour[c]	7.9	--	22.60	13.9	24.04	14.4
	3-hour[a]	25	--	22.92	-	24.22	-
	24-hour[a]	5	13	12.27	1.75	12.45	1.65
	Annual[d]	1	--	0.28	-	0.27	-

[a] Screening impacts based on high-1st-high predicted concentration for all 5 years modeled together.
[b] There is no SIL for lead. The predicted concentration is based on the 3-month rolling average (obtained using USEPA's LEADPOST post-processor) for comparison against the SMC.

[c] The 1-hour NO_2 and SO_2 screening impacts are based on the 5-year average high-1st-high daily maxima predicted concentrations for all 5 years modeled together.

[d] Screening impact is based on the maximum annual predicted concentration for all 5 years modeled separately.

[e] For the NAAQS, the screening impacts are based on 5-year average high-1st-high 24-hour maxima for all 5 years modeled together.

[f] For the NAAQS, the screening impacts are based on 5-year average high-1st-high annual maxima for all 5 years modeled together.

10.3 Cumulative Modeling

This section describes the methodology and results for all triggered cumulative impact analyses.

10.3.1 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. Additionally, for the particulate matter runs, the receptor grid was split such that receptors on and within Outokumpu's fence line were segregated and run separately excluding Outokumpu's emission impacts from within its own property. The modeling runs for the receptors outside of Outokumpu's fence line were run normally including the project, AM/NS existing facility and all offsite inventory sources.

In order to have a NAAQS exceedance, the total concentration at a specific time and location must exceed the NAAQS. A secondary 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 contributions are greater than the SIL. Table 10-2 shows the results of these NAAQS assessments for both the airport and site meteorological modeling runs. The results for the predicted particulate matter impacts both within and outside of the Outokumpu plant boundary have been merged for clarity. Except for two cases discussed below, all predicted criteria pollutant NAAQS impacts were below the threshold values and hence showed compliance with the NAAQS. Additionally, as noted previously, the predicted lead impacts from the project are added to Table 10-2, for reference only as these results are directly from the modeling conducted for SMC analysis.

Table 10-2 NAAQS Assessment Results

Pollutant	Ave Period	NAAQS (μg/m³)	Back-ground (μg/m³)	Predicted Concentration (μg/m³)				
				Airport Met		Site Met		Highest Overall
				Predicted Conc.	Predicted Conc. + Background	Predicted Conc.	Predicted Conc. + Background	
NO_2	1-hr	188	31	2,759.49	2,790.49	2,741.50	2,772.50	2790.49
Pb	Month	1.5E-01	-	-	4.98E-03	-	5.26E-03	5.26E-03
$PM_{2.5}$	24-hr	35	17	16.93	33.93	16.54	33.54	33.93
	Annual	12	7.3	4.14	11.44	4.03	11.33	11.44
PM_{10}	24-hr	150	25	15.61	40.61	14.45	39.45	40.61
SO_2	1-hr	196	29	254.88 (294.43[a])	283.88 (323.43[a])	213.49 (239.27[a])	242.49 (268.27 [a])	283.88 (323.43[a])

[a] *Predicted 1-hour SO_2 ground concentration based on modeling performed on an additional refined 100 m receptor grid (see Section 10.3.2)*

Rogers, R Jackson

From:	Rogers, R Jackson
Sent:	Friday, January 15, 2021 5:19 PM
To:	Pinckard, Robert
Cc:	Joe Gross
Subject:	PSD Revision - Appendix F baghouse pages
Attachments:	33818 503-0095 097 01-15-2021 PSDA RJR New Meltshops REV Appdendix F ADD.pdf

Robert,

My take on the 12/31/20 revision, after having reviewed it, it that it does and is meant to contain everything the initial application had plus the various changes made. But there's one exception I noticed: Appendix F contains only the new monitoring plan for the WESP and Flares but omits the plans for the Baghouses. You meant to include the attached pages, right? If so I'll file this to where the public can easily view it with the revision.

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ADEM

AM/NS Calvert, LLC
Electric Arc Furnace 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 proposed EAF operations as part of this project are controlled by negative pressure baghouses. The proposed EAF operations, pre-controlled, emit PM at levels that would, by themselves, exceed a major source threshold, and are subject to 40 CFR Part 60 Subpart AAa (NSPS AAa) which has a corresponding PM limit.

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 negative pressure baghouses which collect particulate emissions from the proposed EAF operations and melt shop building.

The melt shop building will be evacuated to negative pressure fabric filter baghouses each with a capacity of 1.9 MM acfm. Emissions are vented to the baghouses by a main canopy hood over the EAFs and other indirect ducts located throughout the melt shop. The baghouses will use polyester felt bags and a pulse-jet design to clean the bags. In accordance with NSPS AAa, the baghouses will achieve PM emissions of 0.0052 grains per dry standard cubic foot (gr/dscf).

2.0 Monitoring Approach

Monitoring of the Baghouses for compliance is accomplished by:

1. The use of a continuous opacity monitoring system (COMS).

2. Weekly inspections and applicable maintenance conducted according to work practices and procedures.

3. Annual emissions performance tests.

3.0 Rationale for Selection of Performance Indicators

The rationale for the selection of performance indicators associated with the above monitoring is as follows:

AM/NS Calvert, LLC
Electric Arc Furnace Baghouse
Compliance Assurance Monitoring Plan
APPENDIX F

1. Opacity monitoring via the use of a COMS 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 (e.g., loose or torn bags). The emission unit has an opacity standard of less than 3 percent.

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. Visual inspections of the baghouses and key control equipment, such as damper actuators, pressure sensors, fan blades, housing and motors, ductwork, and bag conditions, will be logged into the Enviance system.

3. Emissions testing for particulate matter using approved EPA Methods will confirm compliance performance of the baghouse. A performance test on the baghouse will be conducted on an annual basis. Testing parameters will be consistent with daily operating conditions.

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 opacity is a 6-minute average opacity of less than 3 percent. This indicator range was selected based on 40 CFR §60.272a(a)(2) and because an increase in visible emissions is indicative of an increase in particulate emissions.

2. The indicator range for maintenance and inspection is the observation of visible emissions.

3. The indicator range for the baghouse is particulate grain loading less than 0.0052 gr/dscf as measured by Reference Method 5, 40 CFR 60, Appendix A. This indicator range was selected based on the requirements contained in 40 CFR §60.272a(a)(1). An excursion will result in a failed compliance test. The test will be repeated and the cause of the exceedance will be documented and reported.

AM/NS Calvert, LLC
Electric Arc Furnace Baghouse
Compliance Assurance Monitoring Plan
APPENDIX F

Electric Arc Furnace Baghouse CAM Plan

CAM Monitoring Approach		Performance Indicator 1	Performance Indicator 2	Performance Indicator 3	Performance Indicator 4
1	**Indicator**	**Opacity**	**Inspection/Maintenance**	**Opacity**	**Pressure Drop**
A.	Measurement	Opacity from the baghouse exhaust will be monitored using a COMS.	Weekly inspections and applicable maintenance according to work practices and procedures.	Visible emissions from the baghouse exhaust will be monitored daily using EPA Method 9.	Differential pressure across the baghouse will be measured using a differential pressure gauge.
2	**Indicator Range/Excursion**	An excursion is defined as opacity greater than 3%. Excursions trigger an inspection, corrective action, and a reporting requirement.	An excursion is defined as the observation of visible emissions.	An excursion is defined as the presence of visible emissions greater than 3% opacity. Excursions trigger an inspection, corrective action, and a reporting requirement.	The pressure differential range will be established will be established in the future after the equipment manufacturer is selected, and the CAM plan will be updated accordingly Excursions will trigger an inspection, corrective action, and a reporting requirement.
3	**Performance Criteria**				
A.	Data Representativeness	COMS will be located in representative location for emissions exiting baghouse stack	Inspections will be performed at the baghouse.	Visual inspection logs will be maintained and audited to ensure VE readings are conducted.	The differential pressure will measure the pressure difference between the inlet and outlet of the baghouse.
B	Verification of Operational Status	Records of the readings will be maintained by the environmental department.	NA	Records of the readings will be maintained by the environmental department.	NA

AM/NS Calvert, LLC
Electric Arc Furnace Baghouse
Compliance Assurance Monitoring Plan
APPENDIX F

CAM Monitoring Approach		Performance Indicator 1	Performance Indicator 2	Performance Indicator 3	Performance Indicator 4
C	QA/QC Practices & Criteria	40 CFR §60.13 and Appendix B of Part 60	Qualified personnel will perform inspections and maintenance.	Method 9 Reader will be certified, and training records will be maintained by the environmental department.	The differential pressure gauge will have a performance check quarterly.
D	Monitoring Frequency	Continuous	Weekly	Daily	At least once every 15 minutes.
4	**Data Collection Procedures**	Data will be continuously recorded and maintained in the Enviance system.	Records are maintained to document weekly inspections and any required maintenance.	The VE observer will be familiar with baghouse operations and be a certified VE reader.	The pressure differential will be recorded with date and time.
5	**Averaging Period**	6 minute average	NA	6 minute average	Instantaneous
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.	Maintain records for a period of 5 years.
7	**Reporting**	Number, duration, cause of excursion, and corrective action taken.	Number, duration, cause of any excursion and the corrective action taken.	Number, duration, cause of excursion, and corrective action taken.	Number, duration, cause of excursion, and corrective action taken.

Rogers, R Jackson

From: Rogers, R Jackson
Sent: Friday, January 22, 2021 8:16 AM
To: Cole, Lisa B
Cc: Youngpeter, Jennifer S
Subject: RE: AM/NS PSD application files

I'll fix that up then, and pull the relevant parts of the INIT into that doc. In that consolidated pdf, I'll use this email as a preface to the attached Appendices from the INIT if that's OK too.

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ADEM

From: Cole, Lisa B <LBCole@adem.alabama.gov>
Sent: Thursday, January 21, 2021 5:39 PM
To: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Cc: Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>
Subject: Re: AM/NS PSD application files

For the notice we need to have a single doc for the application. I can send EPA the separate files.

Get Outlook for iOS

From: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Sent: Thursday, January 21, 2021 4:42:36 PM
To: Cole, Lisa B <LBCole@adem.alabama.gov>
Cc: Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>
Subject: AM/NS PSD application files

Lisa,

Sending you the application files for AM/NS Calvert's PSD project. INIT is the initial application. REV is the revision they sent, which is unfortunately not a 100% standalone revision since its Appendices C & F are not all-inclusive and only include the forms they've changed since the start—one has to look at the REV plus the unaltered parts of Appendices C & F from INIT to get a full view. Also the two attached Addendums from Jan 2021.

I will follow up with the Prelim Determination and Jim's increment report after we talk to AMNS again.

Jackson Rogers, P.E.
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Rogers, R Jackson

From: Rogers, R Jackson
Sent: Friday, January 15, 2021 4:45 PM
To: Joe Gross
Cc: Youngpeter, Jennifer S; Pinckard, Robert
Subject: RE: addendum request - engine CO & VOC BACT

Looks good—thank you!

Jackson Rogers, P.E.
Environmental Engineer, Licensed
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Alabama Department of Environmental Management
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jackson.rogers@adem.alabama.gov

From: Joe Gross <Joe.Gross@erm.com>
Sent: Friday, January 15, 2021 9:48 AM
To: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Cc: Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>; Pinckard, Robert <robert.pinckard@arcelormittal.com>
Subject: RE: addendum request - engine CO & VOC BACT

Good Morning Jackson and Happy Friday!

Based on our discussion yesterday, attached are the revised pages from the BACT analysis for the EGENs which includes carrying through diesel oxidation catalyst (DOC) through the cost analysis (step 4).

Best Regards,

Joe Gross
Senior Consultant - Engineering

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Metairie, Louisiana 70002

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E Joe.Gross@erm.com | **W** www.erm.com

ERM The business of sustainability

From: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Sent: Thursday, January 14, 2021 8:47 AM
To: Joe Gross <Joe.Gross@erm.com>
Cc: Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>; Pinckard, Robert <robert.pinckard@arcelormittal.com>
Subject: RE: addendum request - engine CO & VOC BACT

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Joe,

I was just writing a response when you called, to say I also anticipate the economic analysis will bear out that no post controls are necessary. Like I said on the phone, though, since DOC is a valid control alongside CDPF it just has to go through the BACT steps until it's appropriately knocked out or not. Which will be step 4 looking at the source you used for the other technologies.

Thanks,

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From: Joe Gross <Joe.Gross@erm.com>
Sent: Wednesday, January 13, 2021 5:06 PM
To: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Cc: Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>; Pinckard, Robert <robert.pinckard@arcelormittal.com>
Subject: RE: addendum request - engine CO & VOC BACT

Hi Jackson,

For some reason my outlook was acting up and I did not get this email. Can I give you a call tomorrow to discuss? I am anticipating that post-combustion controls will not be required as BACT for the emergency engines as is typical across the industry due to th extremely limited use.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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From: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Sent: Wednesday, January 13, 2021 2:40 PM
To: Joe Gross <Joe.Gross@erm.com>
Cc: Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>; Pinckard, Robert <robert.pinckard@arcelormittal.com>
Subject: RE: addendum request - engine CO & VOC BACT

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Joe,

My understanding, backed up by the EPA Diesel Engine report the BACT analysis cites often, is there's CDPF for PM CO & VOC control, and then there's diesel oxidation catalysts or DOC that are also common/appropriate for controlling VOC & CO from engines without special circumstances that throw the economics out of whack (the 100 hr/yr limitation lowering the denominator on the final $/ton figure). My concern with the first draft of the revision is that oxidation catalysts were dismissed out of hand. Now they're just omitted, and that's not right either.

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From: Joe Gross <Joe.Gross@erm.com>
Sent: Wednesday, January 13, 2021 2:22 PM
To: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Cc: Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>; Pinckard, Robert <robert.pinckard@arcelormittal.com>
Subject: RE: addendum request - engine CO & VOC BACT

Good Afternoon Jackson,

As requested, attached are the updated pages.

Best Regards,

Joe Gross
Senior Consultant - Engineering

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From: Rogers, R Jackson <jackson.rogers@adem.alabama.gov>
Sent: Wednesday, January 13, 2021 10:54 AM
To: Pinckard, Robert <robert.pinckard@arcelormittal.com>
Cc: Joe Gross <Joe.Gross@erm.com>; Youngpeter, Jennifer S <jennifer.youngpeter@adem.alabama.gov>
Subject: addendum request - engine CO & VOC BACT

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Robert,

I don't expect this to affect the timeline, but we need 1.3.6.3 of the BACT analysis (pgs 58 – 59) modified. We reject that oxidation catalysts for diesel engines are technically infeasible—move it on down to the economic feasibility step as you did for SCR and CDPF.

Like you did with Jim, a scan of those pages (and probably page 60 if it shifts everything down) would be the smoothest way to handle it.

Thanks,

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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 diesel generators will have low emissions of NOx, compounded with the fact that they will be restricted to 100 hours per year of operation, makes post combustion controls such as an SCR economically infeasible. Table 1-23 provides an economic evaluation for SCR.

Table 1-23: Economic Evaluation for SCR

Engine Size	SCR Cost Effectiveness \$/ton[36]
2,700 kW	24,637
2,000 kW	24,637
250 kW	24,670

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 1-21.

1.3.6.3 Emergency Diesel Generators CO and 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 CO and 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.

36 EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

Step 3 – Rank Remaining Technically Feasible Control Options

A DOC or CDPF can achieve up to 90% control for CO and VOC.

Step 4 – Evaluate Remaining Control Technologies

Due to the fact that the emergency diesel generators will have low emissions of CO and VOC, compounded with the fact that they will be restricted to 100 hours per year of operation, makes post combustion controls such as a DOC or CDPF economically infeasible. Table 1-24 provides an economic evaluation for a DOC and a CDPF.

Table 1-24: Economic Evaluation for DOC and CDPF

Engine Size	DOC Cost Effectiveness $/ton[37]	CDPF Cost Effectiveness $/ton[37]
2,700 kW	15,836	13,485
2,000 kW	15,836	13,485
250 kW	23,859	32,446

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 1-21.

1.3.6.4 Emergency Diesel Generators SO_2 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 SO_2 controls for the emergency diesel generators includes:

- Good combustion practices;
- Limitations on hours of operation; and
- ULSD

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

The use of ULSD represents the top BACT for emergency diesel generators.

Step 4 – Evaluate Remaining Control Technologies

All of the identified potential control technologies will be implemented for control of SO_2 emissions from the proposed emergency diesel generators.

Step 5 – Selection of BACT

Good combustion practices, the use of ULSD, 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

[37] EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

APPENDIX C ADEM AIR PERMIT APPLICATION FORMS

July 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (AIR DIVISION)

Do not Write in This Space

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

CONSTRUCTION/OPERATING PERMIT APPLICATION
FACILITY IDENTIFICATION FORM

1. Name of Facility, Firm, or Institution: AM/NS Calvert, LLC

Facility Physical Location Address

Street & Number: 1 AMNS Way

City: Calvert County: Mobile Zip: 36513

Facility Mailing Address (If different from above)

Address or PO Box: 1 AMNS Way, P.O. Box 456

City: Calvert State: Alabama Zip: 36513

Owner's Business Mailing Address

2. Owner: AM/NS Calvert, LLC

Street & Number: 1 AMNS Way, P.O. Box 456 City: 36513

State: Alabama Zip: 36513 Telephone: (251) 289-3000

Responsible Official's Business Mailing Address

3. Responsible Official: Charles Greene Title: Chief Operations Officer

Street & Number: 1 AMNS Way

City: Calvert State: Alabama Zip: 36513

Telephone Number: (251) 289-3000 E-mail Address: charles.greene@arcelormittal.com

Plant Contact Information

4. Plant Contact: Ralph Lopez, P.E. Title: Senior Environmental Engineer Manufacturing Technology - Environmental

Telephone Number: (251) 289-4160 E-mail Address: ralph.lopez@arcelormittal.com

5. Location Coordinates:

UTM	405.462 km	E-W	3,446.821 km	N-S
Latitude/Longitude	31.151550	LAT	-87.991827	LONG

6. Permit application is made for:

- ☐ Existing source (initial application)
- ☒ Modification
- ☐ New source (to be constructed)
- ☐ Change of ownership
- ☐ Change of location
- ☐ Other (specify) ____________________

Existing source (permit renewal)

If application is being made to construct or modify, please provide the name and address of installer or contractor

TBD

Telephone TBD

Date construction/modification to begin 04/2021 to be completed 04/2026

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

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

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 opposite the form). Multiple forms may be used as required.

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

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. <u>For those making application for a synthetic minor or major source operating permit</u>, please summarize each pollutant emitted and the 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 PM_{10}	724.14	Yes
Total $PM_{2.5}$	707.88	Yes
Nitrogen Oxides (NOx)	1,854.07	Yes
Sulfur Oxides (SOx)	857.58	Yes
Carbon Monoxide (CO)	4,909.89	Yes
Volatile Organic Compounds (VOCs)	599.11	Yes
Lead	3.87	No
Chlorine	6.80	No
Hydrochloric Acid	12.29	Yes
Hazardous Air Pollutants (HAPs)	52.02	Yes
Carbon Dioxide Equivalent (CO_2e)	3,323,879.15	Yes

*Facility wide potential emissions are the sum of emissions represented in Title V permit renewal application submitted to ADEM on August 16, 2019, and the potential emissions from the new sources added as a result of this project. Potential emissions are either the maximum allowed by the regulations or by the permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity.

11. <u>For those applying for a major source operating permit</u>, indicate the compliance status by program for each emi 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
EAF1	$PM/PM_{10}/PM_{2.5}$	0.0052 gr/dscf	NSPS AAa/PSD	EPA Method 5
EAF1	Opacity	3%	NSPS AAa/PSD	Visual Observation /EPA Method 9
EAF1	CO	2.2 lb/ton	PSD	EPA Method 10
EAF1	SO_2	0.44 lb/ton	PSD	EPA Method 6
EAF1	NO_x	0.35 lb/ton	PSD	EPA Method 7E
EAF1	VOC	0.25 lb/ton	PSD	EPA Method 18 or 25A
EAF1	Pb	0.002 lb/ton	PSD	EPA Method 29
EAF2	$PM/PM_{10}/PM_{2.5}$	0.0052 gr/dscf	NSPS AAa/PSD	EPA Method 5
EAF2	Opacity	3%	NSPS AAa/PSD	Visual Observation /EPA Method 9
EAF2	CO	2.2 lb/ton	PSD	EPA Method 10
EAF2	SO_2	0.44 lb/ton	PSD	EPA Method 6
EAF2	NO_x	0.35 lb/ton	PSD	EPA Method 7E
EAF2	VOC	0.25 lb/ton	PSD	EPA Method 18 or 25A
EAF2	Pb	0.002 lb/ton	PSD	EPA Method 29
Contact Cooling Tower (CCT)	PM/PM_{10}	0.001 % drift	PSD	Routine Preventative Maintenance

Degasser Flare 1 (DF1)	$PM/PM_{10}/PM_{2.5}$	0.25 lb/hr	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 1 (DF1)	CO	25.07 lb/hr	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 1 (DF1)	SO_2	0.60 lb/10^6scf	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 1 (DF1)	NO_x	100 lb/10^6scf	PSD	Annual Flare Inspections
Degasser Flare 1 (DF1)	VOC	5.50 lb/10^6scf	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 1 (DF1)	Pb	0.0005 lb/10^6scf	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 2 (DF2)	$PM/PM_{10}/PM_{2.5}$	0.25 lb/hr	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 2 (DF2)	CO	25.07 lb/hr	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 2 (DF2)	SO_2	0.60 lb/10^6scf	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 2 (DF2)	NO_x	100 lb/10^6scf	PSD	Annual Flare Inspections
Degasser Flare 2 (DF2)	VOC	5.50 lb/10^6scf	PSD	Annual Flare Inspections and Use of Natural Gas
Degasser Flare 2 (DF2)	Pb	0.0005 lb/10^6scf	PSD	Annual Flare Inspections and Use of Natural Gas
Slag Handling	Filterable PM/PM_{10}	0.00054 lb/ton	PSD	EPA Method 5 (Front Half Only)
Slag Hanlding	Filterable $PM_{2.5}$	0.00010 lb/ton	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 1	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 2	Filterable $PM/PM_{10}/PM_{2.}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 3	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)

Alloys Silo 4	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 5	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 6	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 7	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 8	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 9	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 10	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 11	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 12	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 13	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 14	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 15	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 16	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 17	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 18	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 19	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 20	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)

Alloys Silo 21	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 22	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 23	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Alloys Silo 24	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 1	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 2	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 3	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 4	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 5	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 6	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 7	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
DRI Silo 8	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 1	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 2	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 3	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 4	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)

Lime, Dolomite, Bauxite Silo 5	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 6	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 7	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 8	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 9	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Lime, Dolomite, Bauxite Silo 10	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Injection Flux Silo 1	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Injection Flux Silo 2	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Injection Flux Silo 3	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Injection Flux Silo 4	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
Injection Flux Silo 5	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
HBI Silo 1	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
HBI Silo 2	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
HBI Silo 3	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)
HBI Silo 4	Filterable $PM/PM_{10}/PM_{2.5}$	0.005 gr/dscf	PSD	EPA Method 5 (Front Half Only)

Caster Steam Exhaust 1 (CSE1)	Filterable PM/PM_{10}	6.5 mg/m^3	PSD	EPA Method 5 (Front Half Only)
Caster Steam Exhaust 2 (CSE2)	Filterable PM/PM_{10}	6.5 mg/m^3	PSD	EPA Method 5 (Front Half Only)
Scarfing	Filterable PM/PM_{10}	30 mg/m^3	PSD	EPA Method 5 (Front Half Only)
Scarfing	CO	84 lb/10^6scf	PSD	EPA Method 10
Scarfing	SO_2	0.0006 lb/MMBtu	PSD	EPA Method 6
Scarfing	NO_X	100 lb/10^6scf	PSD	EPA Method 7E
Scarfing	VOC	5.5 lb/10^6scf	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 reg 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. 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
Laboratories	ADEM's Trivial and Insignificant Activities List, Section 2.F
Hydraulic or Hydrostatic Testing	ADEM's Trivial and Insignificant Activities List, Section 2.G(2)
Cooling Towers	ADEM's Trivial and Insignificant Activities List, Section 2.I(2)
Welding Operations – Miscellaneous	ADEM's Trivial and Insignificant Activities List, Section 2.G(3)
Wastewater Treatment	ADEM's Trivial and Insignificant Activities List, Section 2.M(12)
Hot Metal Transfer	ADEM's Trivial and Insignificant Activities List, Section 2.L(1)
Slag Cooling	ADEM's Trivial and Insignificant Activities List, Section 2.L(2)
Slag Handling	ADEM's Trivial and Insignificant Activities List, Section 2.L(3)
Electric Discharge Texturing Machine (EDT)	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
One 12,000 gallon Diesel Storage Tank	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
One 2,000 gallon Gasoline Storage Tank	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Six 2,421 gallon Vegetable Oil Based Transformer Insulating Fluid Tanks	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
One 1,495 gallon Vegetable Oil Based Transformer Insulating Fluid Tank	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Twelve 10,500 gallon Anti-Corrosion Oil Storage Tanks	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Six 13,250 gallon Emulsion (Oil/Water) Storage Tanks	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Fume Evacuation Snout on CHDGL-1	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Fume Evacuation Snout on CHDGL-3	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Inspection Line	ADEM's Trivial and Insignificant Activities List, Section 1C
Natural Gas-Fired Heater 1	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Natural Gas-Fired Heater 2	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Natural Gas-Fired Heater 3	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Natural Gas-Fired Heater 4	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Natural Gas-Fired Heater 5	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Natural Gas-Fired Heater 6	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Natural Gas-Fired Heater 7	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Natural Gas-Fired Heater 8	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]
Torching and Cutting	Less than 5 tpy of any regulated pollutant [335-3-16-.01(o)]

13. List and explain any exemptions from applicable requirements the facility is claiming:

a. 40 CFR 63 Subpart EEEEE is not applicable as AM/NS does not perform the regulated molding activities

b. 40 CFR 63 Subpart FFFFF is not applicable as AM/NS does not produce steel from iron ore

c. AAC 335-3-7 is not applicable as no sources from this project are defined as grey iron cupolas, blast furnaces, and basic oxygen steel furnaces

d. AAC 335-3-8 is not applicable as no sources installed as a part of this project have a capacity of greater than 250 MMBtu/hr

e.

f.

g.

h.

i.

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

a. Appendix A – Process Flow Diagrams

b. Appendix B – Emission Calculations

c. Appendix C – ADEM Air Permit Application Forms

d. Appendix D – BACT Analysis

e. Appendix E – RBLC Tables

f. Appendix F – CAM Plan

g. Appendix G – Air Dispersion Modeling Report

h.

i.

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] COO 7/17/20

SIGNATURE OF RESPONSIBLE OFFICIAL | TITLE | DATE

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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

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1. Name of firm or organization: AM/NS 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 ____

Each of the New Melt Shops will consist of material handling activities, one (1) new EAF, one (1) twin LMF, one (1) Continuous Caster with spray vent, one (1) vacuum tank degassing (VTD) flare, and ladle preheating activities. The exhausts from each of the individual melt shop sources (except for the continuous caster spray vent and VTD flare) will be combined prior to exhausting to the atmosphere through the respective New Melt Shop Baghouse. Each Melt Shop will also include one (1) VTD with flare control and a Continuous Caster Spray Vent as noted above.

Each proposed new single shell EAF will be powered by a transformer and natural gas-fired oxygen/fuel burners. The EAFs will operate in a batch mode whereby the scrap steel and scrap substitutes will be charged, melted, and then tapped to a ladle. The temperature of the exhaust gas from the EAFs will approach 3,000°F.

Each of the new EAFs will be equipped with a direct evacuation control (DEC) system (e.g., direct shell evacuation system or DSES) and an overhead roof exhaust system consisting of a canopy hood. Emissions generated during melting, refining and charging will be captured and vented to a New Melt Shop Baghouse. The temperature of the exhaust stream from each of the New Melt Shop baghouses will be approximately 250°F.

Molten steel will be transferred by ladle to the twin LMF for steel refining. Each twin LMF will be equipped with a direct capture system that will capture and vent emissions to the corresponding New Melt Shop Baghouse.

During the steelmaking process, while molten steel is in the ladle and before it is poured, the steel (approximately 30%) must be degassed using a VTD to remove unwanted gases that are dissolved in the liquid. Emissions from the VTD will be routed to a flare for control.

Ladles of molten steel will be transferred from the VTD or LMF by crane to the new Continuous Caster. The molten steel will drain into a vertical, water-cooled mold that is the desired width and thickness of the resulting slab. The continuous steel slab will exit at the bottom of the spray chamber where it will be torch cut at specified lengths into discreet slabs. Emissions generated during the casting process will be captured by the canopy hoods and vented to the corresponding New Melt Shop Baghouse. Steam generated from direct cooling will be captured by the caster steam exhaust system and released to the atmosphere through an emission stack on the roof.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Melt Shop – Electric Arc Furnace (EAF) 1 Operations

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 661,386

Manufactured date: TBD Proposed installation date: TBD

Original installation date (if existing):

Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

Peak production season (if any): None

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
Scrap Steel and Scrap Substitutes	661,386 (331 tons per hour)	661,386 (331 tons per hour)	1,929,043

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 135 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Slabs	1,929,043 (1,750,000 metric tpy)	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

A scrap management plan will be implemented for the minimizing the amount of oils, paint, grease, and plastic in the scrap steel.

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
EAF 1	406.746	3,446.704	200.13	48.9	21.33	75.56	1,392,300 (dscfm)	245

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
EAF 1	Filterable PM/PM_{10}	21.48	62.65	BACT	0.0018	gr/dscf
EAF 1	Filterable $PM_{2.5}$	21.48	62.65	BACT	0.0018	gr/dscf
EAF 1	Condensable PM	40.58	118.35	BACT	0.0034	gr/dscf
EAF 1	CO	727.52	2,121.95	BACT	2.2	lb/ton
EAF 1	SO_2	145.50	424.39	BACT	0.44	lb/ton
EAF 1	NO_x	115.74	337.58	BACT	0.35	lb/ton
EAF 1	VOC	82.67	241.13	BACT	0.25	lb/ton
EAF 1	Pb	0.66	1.93	BACT	0.002	lb/ton
EAF 1	Total HAP	0.93	2.90	AP-42	N/A	
EAF 1	CO_2e	-	810,412.77	40 CFR 98	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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.)
Slag	TBD	25,000 (5 piles)	Wet Suppression
Raw Materials	TBD	4,676,841 (piles)	Wet Suppression

Name of person preparing application: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-				

Do not write in this space

1. Name of firm or organization: AM/NS 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.

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3. Type of unit or process (e.g., calcining kiln, cupola furnace): Melt Shop – Electric Arc Furnace (EAF) 2 Operations

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 661,386

Manufactured date: TBD Proposed installation date: TBD

Original installation date (if existing):

Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

Peak production season (if any): None

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
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6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 135 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Slabs	1,929,043 (1,750,000 metric tpy)	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

A scrap management plan will be implemented for the minimizing the amount of oils, paint, grease, and plastic in the scrap steel.

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

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	E-W (km)	N-S (km)						
EAF 2	406.755	3,446.674	200.13	48.9	21.33	75.56	1,392,300 (dscfm)	245

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
EAF 2	Filterable PM/PM_{10}	21.48	62.65	BACT	0.0018	gr/dscf
EAF 2	Filterable $PM_{2.5}$	21.48	62.65	BACT	0.0018	gr/dscf
EAF 2	Condensable PM	40.58	118.35	BACT	0.0034	gr/dscf
EAF 2	CO	727.52	2,121.95	BACT	2.2	lb/ton
EAF 2	SO_2	145.50	424.39	BACT	0.44	lb/ton
EAF 2	NO_x	115.74	337.58	BACT	0.35	lb/ton
EAF 2	VOC	82.67	241.13	BACT	0.25	lb/ton
EAF 2	Pb	0.66	1.93	BACT	0.002	lb/ton
EAF 2	Total HAP	0.93	2.90	AP-42	N/A	
EAF 2	CO_2e	-	810,412.77	40 CFR 98	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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.)
Slag	TBD	25,000 (5 piles)	Wet Suppression
Raw Materials	TBD	4,676,841 (piles)	Wet Suppression

Name of person preparing application: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   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): Melt Shop – Contact Cooling Tower

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 10,000 gpm

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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	10,000 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):__________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		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
N/A	N/A	N/A

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☐ Yes ☒ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
CCT A (Emissions Split over two Areas)	406.601	3,446.810	30	48.9	30	40	1,696,460	90
CCT B (Emissions Split over two Areas)	406.716	3,446.737	30	48.9	30	40	1,696,460	90

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CCT A	Filterable PM/PM_{10}	0.03	0.14	BACT	0.001 % drift	% drift
CCT A	Filterable $PM_{2.5}$	0.0001	0.0005	BACT	0.001 % drift	% drift
CCT B	Filterable PM/PM_{10}	0.03	0.14	BACT	0.001 % drift	% drift
CCT B	Filterable $PM_{2.5}$	0.0001	0.0005	BACT	0.001 % drift	% drift

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☐ Yes ☒ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   The degassing flares utilize oxygen blowing to produce ultra-low carbon grades of steel. The oxygen blowing provides forced decarburization and chemical reheating, as required. The primary purpose of the vacuum tank degassers is to decarburize, desulfurize, and subsequently remove nitrogen. Sulfur is retained in the slag and not emitted as SO_2. Process gasses from each of the degassing operations will be exhausted to a vent stack and controlled by a flare. The flare will have a natural gas-fired pilot with a natural gas usage rate of 5,100 scf/hr.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Melt Shop – Degasser Flare 1

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 660,000

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Carbon Steel Degassing	330 tons per hour	330 tons per hour	578,713

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 5.2 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Degassing	578,713	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☐ Yes ☒ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DF 1	406.742	3,446.976	161.1	48.9	1.0	65.62	TBD	1,831.73

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DF 1	Filterable PM/PM_{10}	0.22	0.20	BACT	0.22	lb/hr
DF 1	Filterable $PM_{2.5}$	0.22	0.20	BACT	0.22	lb/hr
DF 1	Condensable PM	0.03	0.02	BACT	5.70	lb/10^6scf
DF 1	CO	25.07	21.93	BACT	25.07	lb/hr
DF 1	SO_2	0.003	0.002	BACT	0.60	lb/10^6scf
DF 1	NO_x	0.51	0.39	BACT	100	lb/10^6scf
DF 1	VOC	0.03	0.02	BACT	5.50	lb/10^6scf
DF 1	Pb	2.55×10^{-6}	1.93×10^{-6}	BACT	0.0005	lb/10^6scf
DF 1	Total HAP	0.01	0.01	AP-42	N/A	
DF 1	CO_2e	-	870.34	40 CFR 98 & Combusted CO	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☐ Yes ☒ No

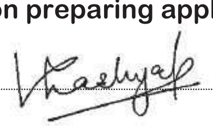
15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ 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: Vikram Kashyap

Signature:  Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   The degassing flares utilize oxygen blowing to produce ultra-low carbon grades of steel. The oxygen blowing provides forced decarburization and chemical reheating, as required. The primary purpose of the vacuum tank degassers is to decarburize, desulfurize, and subsequently remove nitrogen. Sulfur is retained in the slag and not emitted as SO_2. Process gasses from each of the degassing operations will be exhausted to a vent stack and controlled by a flare. The flare will have a natural gas-fired pilot with a natural gas usage rate of 5,100 scf/hr.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Melt Shop –Degasser Flare 2

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 660,000

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Carbon Steel Degassing	330 tons per hour	330 tons per hour	578,713

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 5.2 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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Carbon Steel Degassing	578,713	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☐ Yes ☒ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
VTD 2	406.887	3,446.918	161.1	48.9	1.0	65.62	TBD	1,831.73

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
VTD 2	Filterable PM/PM_{10}	0.22	0.20	BACT	0.22	lb/hr
VTD 2	Filterable $PM_{2.5}$	0.22	0.20	BACT	0.22	lb/hr
VTD 2	Condensable PM	0.03	0.02	BACT	5.70	lb/10^6scf
VTD 2	CO	25.07	21.93	BACT	25.07	lb/hr
VTD 2	SO_2	0.003	0.002	BACT	0.60	lb/10^6scf
VTD 2	NO_x	0.51	0.39	BACT	100	lb/10^6scf
VTD 2	VOC	0.03	0.02	BACT	5.50	lb/10^6scf
VTD 2	Pb	$2.55x10^{-6}$	$1.93x10^{-6}$	BACT	0.0005	lb/10^6scf
VTD 2	Total HAP	0.01	0.01	AP-42	N/A	
VTD 2	CO_2e	-	870.34	40 CFR 98 & Combusted CO	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☐ Yes ☒ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   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.
   The upper part of the strand guide will have a secondary cooling system that will spray water on the strand. Steam emissions from this cooling system will be vented through the caster steam exhaust stack.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Caster Steam Exhaust 1

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 240,000 m^3/hr

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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	5000 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):___________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		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
N/A	N/A	N/A

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☐ Yes ☒ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
CSE 1	406.867	3,446.973	133.14	48.9	4.65	138.71	141,259	140

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CSE 1	Filterable PM/PM_{10}	3.44	15.06	BACT	3.44	lb/hr
CSE 1	Filterable $PM_{2.5}$	3.44	15.06	BACT	3.44	lb/hr

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☐ Yes ☒ No

15. 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: Vikram Kashyap

Signature: VKashyap

Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   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. The upper part of the strand guide will have a secondary cooling system that will spray water on the strand. Steam emissions from this cooling system will be vented through the caster steam exhaust stack.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Caster Steam Exhaust 2

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 240,000 m^3/hr

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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	5000 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):___________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		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
N/A	N/A	N/A

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☐ Yes ☒ No (Where a control device exists, ADEM Form 110 must be completed and attached).

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Emission Point	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
CSE 2	406.833	3,447.008	133.14	48.9	4.65	138.71	141,259	140

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
CSE 2	Filterable PM/PM_{10}	3.44	15.06	BACT	3.44	lb/hr
CSE 2	Filterable $PM_{2.5}$	3.44	15.06	BACT	3.44	lb/hr

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

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15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS Calvert, LLC

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   Operating scenario number ____

   AM/NS is proposing to install a slag handling operation that includes the sorting, crushing, and grinding of slag. The system will be located outside of the melt shop. The grinding and crushing operation will be a damp process. Water will be added to minimize dust and smoke. The process has the potential to release PM emissions in the form of dust and smoke.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Melt Shop – Slag Handling

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 440,924

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Slag	220 tons per hour	N/A	578,713

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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Recovered Metallics and aggregate	72,339	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Slag arriving from the melt shop is quenched and continuously sprayed throughout the slag recycling process.This minimizes the emissions of dust from the slag yard.

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

☐ Yes ☒ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Slag	406.455	3,446.523	N/A	N/A	N/A	N/A	N/A	N/A

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Slag	Filterable PM/PM_{10}	0.12	0.16	BACT	0.00054	lb/ton
Slag	Filterable $PM_{2.5}$	0.02	0.03	BACT	0.00010	lb/ton

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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.)
Slag	TBD	27,558 (5 piles)	Wet Suppression

Name of person preparing application: Vikram Kashyap

Signature: [signature]

Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a scarfing operation in order to support Melt Shop Operations. Scarfing is performed in order to remove surface material from the cast slab and improve the surface quality of the finished steel sheet. The cooled slabs will be loaded onto a rolling table using a crane. The slab is transported via rollers to the aligning table to be adjusted before being automatically fed through the scarfing machine. The scarfing process involves the slabs being torched on two sides at a time. The torching accomplishes the removal of surface materials by causing these materials to undergo a thermochemical exothermic reaction of oxygen and fuel gas. Once the slab passes through the scarfing machine, it is flipped and sent back through in order to torch the remaining two sides.

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

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 423,287

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

   Hours per day: 18   Days per week: 7   Weeks per year: 52

   Peak production season (if any): None

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
Slabs	423,287	N/A	1,377,888

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104): 3.53 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		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
Treated Slabs	1,377,888	tpy

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Scarfing ESP	406.899	3,447.137	213.25	48.9	7.22	65.62	164,802	140

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Scarfing ESP	Total PM_{10}	15.36	50.00	BACT	30	mg/m^3
Scarfing ESP	Total $PM_{2.5}$	15.36	50.00	BACT	30	mg/m^3
Scarfing ESP	CO	0.29	0.95	BACT	84.00	lb/10^6 ft^3
Scarfing ESP	SO_2	0.002	0.01	BACT	0.60	lb/10^6 ft^3
Scarfing ESP	NO_X	0.35	1.13	BACT	100.00	lb/10^6 ft^3
Scarfing ESP	VOC	0.02	0.06	BACT	5.50	lb/10^6 ft^3
Scarfing ESP	Total HAP	0.01	0.02	AP-42	N/A	
Scarfing ESP	CO_2e	-	1,345.73	40 CFR 98	N/A	

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. **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.)

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

☒ **Yes** ☐ **No**

15. **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: Vikram Kashyap

Signature: VKashyap **Date:** July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 1

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 1	407.022	3,446.747	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 1	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 1	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: Kashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 2

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 2	407.020	3,446.745	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 2	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 2	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 3

   Make: TBD

   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD

   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

   Hours per day: 24

   Days per week: 7

   Weeks per year: 52

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 3	407.018	3,446.743	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 3	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 3	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 4

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 4	407.016	3,446.741	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 4	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 4	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 5

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 5	407.014	3,446.739	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 5	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 5	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 6

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 6	407.012	3,446.737	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 6	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 6	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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   Operating scenario number ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 7

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 7	407.020	3,446.749	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 7	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 7	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS Calvert, LLC

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   Operating scenario number ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 8

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 8	407.018	3,446.747	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 8	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 8	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS Calvert, LLC

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   Operating scenario number ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 9

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 9	407.016	3,446.745	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 9	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 9	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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   Operating scenario number ____

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3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 10

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 10	407.014	3,446.743	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 10	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 10	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(1) Illustrate input of raw materials,

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(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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Process flow diagram

13. 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.)

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

☒ Yes ☐ No

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☐ 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[| |] - [| | |] - [| | |]
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   Operating scenario number ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 11

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 11	407.012	3,446.741	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 11	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 11	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 12

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 12	407.010	3,446.739	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 12	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 12	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 13

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 13	407.015	3,446.754	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 13	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 13	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 14

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 14	407.013	3,446.752	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 14	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 14	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: Vkashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 15

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 15	407.011	3,446.750	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 15	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 15	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 16

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 16	407.009	3,446.748	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 16	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 16	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 17

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 17	407.007	3,446.746	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 17	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 17	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 18

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 18	407.005	3,446.744	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 18	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 18	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 19

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
Alloys Silo 19	407.013	3,446.756	59.50	48.9	3.39	0.37	200	68

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 19	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 19	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 20

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 20	407.011	3,446.754	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 20	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 20	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: Kashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 21

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 21	407.009	3,446.752	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 21	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 21	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 22

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 22	407.007	3,446.750	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 22	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 22	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 23

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 23	407.005	3,446.748	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 23	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 23	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Alloys Storage Silo 24

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 1,059 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Alloys	1,059 ft^3	1,059 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Alloys	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Alloys Silo 24	407.003	3,446.746	59.50	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Alloys Silo 24	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Alloys Silo 24	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

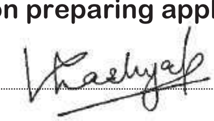
15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ 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: Vikram Kashyap

Signature:  Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 1

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DRI Silo 1	407.087	3,446.801	90.0	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 1	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 1	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 2

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DRI Silo 2	407.072	3,446.786	90.0	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 2	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 2	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 3

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing): ______

   Reconstruction or Modification date (if applicable): ______

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DRI Silo 3	407.057	3,446.771	90.0	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 3	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 3	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap

Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 4

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DRI Silo 4	407.042	3,446.756	90.0	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 4	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 4	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap

Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 5

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
DRI Silo 5	407.073	3,446.816	90.0	48.9	3.39	1.48	800	68

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 5	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 5	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 6

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DRI Silo 6	407.057	3,446.801	90.0	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 6	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 6	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 7

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DRI Silo 7	407.042	3,446.786	90.0	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 7	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 7	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DRI Storage Silo 8

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
DRI	375,000 ft^3	375,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
DRI	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
DRI Silo 8	407.027	3,446.771	90.0	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
DRI Silo 8	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
DRI Silo 8	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[| |] - [| | |] - [| | |]
Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Injection Flux Storage Silo 1

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 3,531 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Injection Flux	3,531 ft^3	3,531 ft^3	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

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)						

7. Products of process or unit:

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

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Flux Silo 1	406.987	3,446.740	56.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Flux Silo 1	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Flux Silo 1	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Injection Flux Storage Silo 2

   Make: TBD
   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 3,531 (ft^3) capacity

   Manufactured date: TBD
   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Injection Flux	3,531 ft^3	3,531 ft^3	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

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)						

7. Products of process or unit:

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

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Flux Silo 2	406.982	3,446.745	56.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Flux Silo 2	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Flux Silo 2	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Injection Flux Storage Silo 3

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 3,531 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Injection Flux	3,531 ft^3	3,531 ft^3	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

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)						

7. Products of process or unit:

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

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Flux Silo 3	406.977	3,446.750	56.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Flux Silo 3	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Flux Silo 3	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap

Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Injection Flux Storage Silo 4

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 3,531 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Injection Flux	3,531 ft^3	3,531 ft^3	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

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)						

7. Products of process or unit:

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

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Flux Silo 4	406.972	3,446.755	56.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Flux Silo 4	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Flux Silo 4	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Injection Flux Storage Silo 5

   Make: TBD　　Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 3,531 (ft^3) capacity

   Manufactured date: TBD　　Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Injection Flux	3,531 ft^3	3,531 ft^3	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

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)						

7. Products of process or unit:

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

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
Flux Silo 5	406.967	3,446.760	56.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Flux Silo 5	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
Flux Silo 5	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Hot Briquetted Iron Storage Silo 1

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 2,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Hot Briquetted Iron	2,000 ft^3	2,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Hot Briquetted Iron	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
HBI Silo 1	407.040	3,446.733	51.00	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HBI Silo 1	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
HBI Silo 1	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

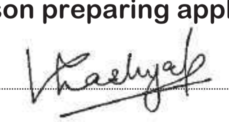
15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ 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: Vikram Kashyap

Signature:  Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Hot Briquetted Iron Storage Silo 2

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 2,000 (ft^3) capacity

Manufactured date: TBD Proposed installation date: TBD

Original installation date (if existing):

Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

Peak production season (if any): None

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
Hot Briquetted Iron	2,000 ft^3	2,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Hot Briquetted Iron	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
HBI Silo 2	407.038	3,446.731	51.00	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HBI Silo 2	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
HBI Silo 2	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

				-					-				

Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Hot Briquetted Iron Storage Silo 3

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 2,000 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Hot Briquetted Iron	2,000 ft^3	2,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Hot Briquetted Iron	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
HBI Silo 3	407.034	3,446.727	51.00	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HBI Silo 3	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
HBI Silo 3	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control PM/PM_{10}/$PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Hot Briquetted Iron Storage Silo 4

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 2,000 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Hot Briquetted Iron	2,000 ft^3	2,000 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Hot Briquetted Iron	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
HBI Silo 4	407.032	3,446.726	51.00	48.9	3.39	1.48	800	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
HBI Silo 4	Filterable PM/PM_{10}	0.034	0.15	BACT	0.005	gr/dscf
HBI Silo 4	Filterable $PM_{2.5}$	0.034	0.15	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 1

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 1	407.033	3,446.738	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 1	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 1	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: V Kashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 2

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 2	407.030	3,446.736	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 2	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 2	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 3

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 3	407.027	3,446.733	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 3	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 3	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 4

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 4	407.024	3,446.730	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 4	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 4	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 5

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 5	407.021	3,446.727	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 5	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 5	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____
   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 6

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 6	407.030	3,446.741	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 6	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 6	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-				

Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 7

   Make: TBD   Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD   Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 7	407.027	3,446.739	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 7	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 7	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: [signature] Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-					

Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 8

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 8	407.024	3,446.736	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 8	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 8	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 9

Make: TBD Model: TBD

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

Manufactured date: TBD Proposed installation date: TBD

Original installation date (if existing):

Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
LDB Silo 9	407.021	3,446.733	107.60	48.9	3.39	0.37	200	68

* std temperature is 68ºF - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 9	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 9	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: Kashyap Date: July 10, 2020

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-					

Do not write in this space

1. Name of firm or organization: AM/NS 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 ____

   AM/NS is proposing to install a series of material transfer stations, conveyor systems, and storage silos to support processes in the New Melt Shops. Storage silos will be equipped with bin vent filters to control $PM/PM_{10}/PM_{2.5}$ emissions.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Lime, Dolomite and Bauxite Storage Silo 10

   Make: TBD Model: TBD

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 7,946 (ft^3) capacity

   Manufactured date: TBD Proposed installation date: TBD

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

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

   Peak production season (if any): None

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
Lime, Dolomite and Bauxite	7,946 ft^3	7,946 ft^3	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

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)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lime, Dolomite and Bauxite	N/A	

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

None

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

☒ Yes ☐ No (Where a control device exists, ADEM Form 110 must be completed and attached).

10. 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	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
LDB Silo 10	407.018	3,446.730	107.60	48.9	3.39	0.37	200	68

* std temperature is 68°F - std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LDB Silo 10	Filterable PM/PM_{10}	0.0086	0.038	BACT	0.005	gr/dscf
LDB Silo 10	Filterable $PM_{2.5}$	0.0086	0.038	BACT	0.005	gr/dscf

12. Using a flow diagram:

(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.

☒ (Check box is extra pages are attached)
Process flow diagram

13. 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.)

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

☒ Yes ☐ No

15. 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: Vikram Kashyap

Signature: VKashyap Date: July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe):
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   EAF 1
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	21,480	21,480	
Designed	21.48	21.48	
Manufacturer's guaranteed	0.0018 gr/dscf	0.0018 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.0018 gr/dscf	0.0018 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	99.9	99.9	
Manufacturer's guaranteed	99.9	99.9	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	1,392,300		1,392,300
(ACFM, existing conditions)	1,428,000		1,428,000
Temperature (ºF)	TBD		245
Velocity (ft/sec)	TBD		75.56
Percent moisture	2.5%		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.746	(km)
UTM Coordinates (N-S)	3,446.704	(km)
Height above grade	200.13	(feet)
Inside diameter at exit (if opening is round)	21.33	(feet)
Inside area at exit (if opening is not round)		(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	200.13	(feet)

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.

See attached PFD

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.)

The proposed baghouse will operate with a high air-to-cloth ratio (up to 1.5 – 1.8 m/1'). The proposed bags are anticipated to be made of polyester felt. The baghouse will utilize a pulse-jet design. The differential pressure across the baghouse will be monitored for the indication of proper performance.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		N/A	
Composition	Metal Dust			
Is waste hazardous?	TBD			
Method of disposal	Offsite			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Vikram Kashyap

Signature Kashyap

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe):

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

EAF 2

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	21,480	21,480	
Designed	21.48	21.48	
Manufacturer's guaranteed	0.0018 gr/dscf	0.0018 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.0018 gr/dscf	0.0018 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	99.9	99.9	
Manufacturer's guaranteed	99.9	99.9	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	1,392,300		1,392,300
(ACFM, existing conditions)	1,428,000		1,428,000
Temperature (ºF)	TBD		245
Velocity (ft/sec)	TBD		75.56
Percent moisture	2.5%		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.755	(km)
UTM Coordinates (N-S)	3,446.674	(km)
Height above grade	200.13	(feet)
Inside diameter at exit (if opening is round) ...	21.33	(feet)
Inside area at exit (if opening is not round)		(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height..................................	200.13	(feet)

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.

See attached PFD

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.)

The proposed baghouse will operate with a high air-to-cloth ratio (up to 1.5 – 1.8 m/1'). The proposed bags are anticipated to be made of polyester felt. The baghouse will utilize a pulse-jet design. The differential pressure across the baghouse will be monitored for the indication of proper performance.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		N/A	
Composition	Metal Dust			
Is waste hazardous?	TBD			
Method of disposal	Offsite			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Vikram Kashyap

Signature Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe):

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Scarfing

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	1,438.30	1,438.30	
Designed	15.36	15.36	
Manufacturer's guaranteed	30 mg/m^3	30 mg/m^3	
Mass emission rate (units of the Standard)			
Required by regulation	N/A	N/A	
Manufacturer's guaranteed	30 mg/m^3	30 mg/m^3	
Removal efficiency (%)			
Designed	98.9	98.9	
Manufacturer's guaranteed	98.9	98.9	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	164,801.80		164,801.80
(ACFM, existing conditions)			
Temperature (ºF)	TBD		140
Velocity (ft/sec)	TBD		65.62
Percent moisture	TBD		TBD

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.899	(km)
UTM Coordinates (N-S)	3,447.138	(km)
Height above grade	213.25	(feet)
Inside diameter at exit (if opening is round) ...	7.22	(feet)
Inside area at exit (if opening is not round)		(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	213.25	(feet)

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.

See attached PFD

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.)

The voltage associated with the ESP will be monitored for the indication of proper performance.

12. By-pass (if any) is to be used when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	TBD		N/A	
Composition	Metal Dust			
Is waste hazardous?	TBD			
Method of disposal	Offsite			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Vikram Kashyap

Signature VKashyap Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 1

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.022	(km)
UTM Coordinates (N-S)	3,446.747	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 2

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.020	(km)
UTM Coordinates (N-S)	3,446.745	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer: TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 3

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.018	(km)
UTM Coordinates (N-S)	3,446.743	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Kashyap

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 4

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.016	(km)
UTM Coordinates (N-S)	3,446.741	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 5

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.014	(km)
UTM Coordinates (N-S)	3,446.739	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Kashyap Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 6
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches $H_2 0$)

7. Stack dimensions:

UTM Coordinates (E-W)	407.012	(km)
UTM Coordinates (N-S)	3,446.737	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 7

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.020	(km)
UTM Coordinates (N-S)	3,446.749	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Kashyap Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 8

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.018	(km)
UTM Coordinates (N-S)	3,446.747	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature]

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 9

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.016	(km)
UTM Coordinates (N-S)	3,446.745	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 10

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)	407.014	(km)
UTM Coordinates (N-S)	3,446.743	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature VKashyap

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 11
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.012	(km)
UTM Coordinates (N-S)	3,446.741	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 12

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.010	(km)
UTM Coordinates (N-S)	3,446.739	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 13

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)	407.015	(km)
UTM Coordinates (N-S)	3,446.754	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 14

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.013	(km)
UTM Coordinates (N-S)	3,446.752	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer TBD   Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 15

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.011	(km)
UTM Coordinates (N-S)	3,446.750	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 16

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.009	(km)
UTM Coordinates (N-S)	3,446.748	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 17

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.007	(km)
UTM Coordinates (N-S)	3,446.746	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 18

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.005	(km)
UTM Coordinates (N-S)	3,446.744	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature]

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 19
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.013	(km)
UTM Coordinates (N-S)	3,446.756	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 20

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.011	(km)
UTM Coordinates (N-S)	3,446.754	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height..................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Kashyap Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 21

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.009	(km)
UTM Coordinates (N-S)	3,446.752	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 22

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.007	(km)
UTM Coordinates (N-S)	3,446.750	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   Alloys Storage Silo 23
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.005	(km)
UTM Coordinates (N-S)	3,446.748	(km)
Height above grade	59.50	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature]

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD   Model no. TBD

4. Emission source to which device is installed or is to be installed:

Alloys Storage Silo 24

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches $H_2 0$)

7. Stack dimensions:

UTM Coordinates (E-W) .... 407.003 (km)

UTM Coordinates (N-S) .... 3,446.746 (km)

Height above grade .... 59.50 (feet)

Inside diameter at exit (if opening is round) ... (feet)

Inside area at exit (if opening is not round) ..... 9 (sq. feet)

Base Elevation..................................... 48.9 (feet)

GEP Stack Height................................. 110 (feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   DRI Storage Silo 1
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.087	(km)
UTM Coordinates (N-S)	3,446.801	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[| |] - [| | |] - [| | |]

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   DRI Storage Silo 2
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.072	(km)
UTM Coordinates (N-S)	3,446.786	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height..................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

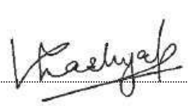
N/A

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 Vikram Kashyap

Signature  Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD   Model no. TBD
4. Emission source to which device is installed or is to be installed:

   DRI Storage Silo 3
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.057	(km)
UTM Coordinates (N-S)	3,446.771	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

DRI Storage Silo 4

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.042	(km)
UTM Coordinates (N-S)	3,446.756	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

DRI Storage Silo 5

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)	407.073	(km)
UTM Coordinates (N-S)	3,446.816	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

DRI Storage Silo 6

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.057	(km)
UTM Coordinates (N-S)	3,446.801	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

DRI Storage Silo 7

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.042	(km)
UTM Coordinates (N-S)	3,446.786	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

DRI Storage Silo 8

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.027	(km)
UTM Coordinates (N-S)	3,446.771	(km)
Height above grade	90.0	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height..................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Injection Flux Storage Silo 1

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.987	(km)
UTM Coordinates (N-S)	3,446.740	(km)
Height above grade	56.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Kashyap

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   Injection Flux Storage Silo 2
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.982	(km)
UTM Coordinates (N-S)	3,446.745	(km)
Height above grade	56.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer: TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Injection Flux Storage Silo 3

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W) .... 406.977 (km)

UTM Coordinates (N-S) .... 3,446.750 (km)

Height above grade .... 56.60 (feet)

Inside diameter at exit (if opening is round) ... (feet)

Inside area at exit (if opening is not round) ..... 9 (sq. feet)

Base Elevation...................................... 48.9 (feet)

GEP Stack Height................................. 110 (feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Injection Flux Storage Silo 4

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.972	(km)
UTM Coordinates (N-S)	3,446.755	(km)
Height above grade	56.60	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   Injection Flux Storage Silo 5
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	406.967	(km)
UTM Coordinates (N-S)	3,446.760	(km)
Height above grade	56.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature]

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Hot Briquetted Iron Storage Silo 1

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches $H_2 0$)

7. Stack dimensions:

UTM Coordinates (E-W)	407.040	(km)
UTM Coordinates (N-S)	3,446.733	(km)
Height above grade	51.00	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Hot Briquetted Iron Storage Silo 2

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.038	(km)
UTM Coordinates (N-S)	3,446.731	(km)
Height above grade	51.00	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Hot Briquetted Iron Storage Silo 3

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.034	(km)
UTM Coordinates (N-S)	3,446.727	(km)
Height above grade	51.00	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature]

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

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

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Hot Briquetted Iron Storage Silo 4

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.034	0.034	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		800
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)	407.032	(km)
UTM Coordinates (N-S)	3,446.726	(km)
Height above grade	51.00	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature VKashyap

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Lime, Dolomite and Bauxite Silo 1

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.033	(km)
UTM Coordinates (N-S)	3,446.738	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation......................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Lime, Dolomite and Bauxite Silo 2

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches $H_2 0$)

7. Stack dimensions:

UTM Coordinates (E-W)	407.030	(km)
UTM Coordinates (N-S)	3,446.736	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Lime, Dolomite and Bauxite Silo 3

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W) .... 407.027 (km)

UTM Coordinates (N-S) .... 3,446.733 (km)

Height above grade .... 107.60 (feet)

Inside diameter at exit (if opening is round) ... (feet)

Inside area at exit (if opening is not round) ..... 9 (sq. feet)

Base Elevation..................................... 48.9 (feet)

GEP Stack Height................................. 110 (feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Lime, Dolomite and Bauxite Silo 4

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.024	(km)
UTM Coordinates (N-S)	3,446.730	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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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Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

(ADEM Use Only)

1. Name of firm or organization: AM/NS 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

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Lime, Dolomite and Bauxite Silo 5

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.021	(km)
UTM Coordinates (N-S)	3,446.727	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

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   - ☐ Afterburner
   - ☐ Cyclone
   - ☐ Absorber
   - ☐ Condenser
   - ☐ Electrostatic precipitator
   - ☐ Baghouse
   - ☐ Multiclone
   - ☐ Adsorber
   - ☐ Wet Suppression

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Lime, Dolomite and Bauxite Silo 6

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches $H_2 0$)

7. Stack dimensions:

UTM Coordinates (E-W)	407.030	(km)
UTM Coordinates (N-S)	3,446.741	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

See attached PFD

9. Enclosed are:

- ☐ Blueprints
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- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

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The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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AIR POLLUTION CONTROL DEVICE

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☐ Afterburner ☐ Baghouse

☐ Cyclone ☐ Multiclone

☐ Absorber ☐ Adsorber

☐ Condenser ☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Lime, Dolomite and Bauxite Silo 7

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches $H_2$0)

7. Stack dimensions:

UTM Coordinates (E-W)	407.027	(km)
UTM Coordinates (N-S)	3,446.739	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation.....................................	48.9	(feet)
GEP Stack Height.................................	110	(feet)

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.

See attached PFD

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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature]

Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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☐ Afterburner ☐ Baghouse
☐ Cyclone ☐ Multiclone
☐ Absorber ☐ Adsorber
☐ Condenser ☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

Lime, Dolomite and Bauxite Silo 8

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.024	(km)
UTM Coordinates (N-S)	3,446.736	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

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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.)

Proper cleaning of the filter media will be important for optimal performance of the bin vent filter.

The filter media will be cleaned according to manufacturer's recommendations.

12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature] Date July 10, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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   - ☐ Cyclone
   - ☐ Multiclone
   - ☐ Absorber
   - ☐ Adsorber
   - ☐ Condenser
   - ☐ Wet Suppression

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter
3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD
4. Emission source to which device is installed or is to be installed:

   Lime, Dolomite and Bauxite Silo 9
5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches $H_2 0$)

7. Stack dimensions:

UTM Coordinates (E-W)	407.021	(km)
UTM Coordinates (N-S)	3,446.733	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round)		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation	48.9	(feet)
GEP Stack Height	110	(feet)

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.

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12. By-pass (if any) is to be used when:

N/A

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 Vikram Kashyap

Signature [signature]

Date July 10, 2020

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   - ☐ Baghouse
   - ☐ Cyclone
   - ☐ Multiclone
   - ☐ Absorber
   - ☐ Adsorber
   - ☐ Condenser
   - ☐ Wet Suppression

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type)

   Other (describe): Bin Vent Filter

3. Control device manufacturer's information:

   Name of manufacturer TBD Model no. TBD

4. Emission source to which device is installed or is to be installed:

   Lime, Dolomite and Bauxite Silo 10

5. Emission parameters:

	Pollutants Removed		
	Filterable PM/PM_{10}	Filterable $PM_{2.5}$	
Mass emission rate (#/hr)			
Uncontrolled	TBD	TBD	
Designed	0.0086	0.0086	
Manufacturer's guaranteed	0.005 gr/dscf	0.005 gr/dscf	
Mass emission rate (units of the Standard)			
Required by regulation	0.005 gr/dscf	0.005 gr/dscf	
Manufacturer's guaranteed	TBD	TBD	
Removal efficiency (%)			
Designed	TBD	TBD	
Manufacturer's guaranteed	TBD	TBD	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	N/A		200
(ACFM, existing conditions)	N/A		TBD
Temperature (ºF)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	TBD		

Pressure drop across device: TBD (inches H_20)

7. Stack dimensions:

UTM Coordinates (E-W)	407.018	(km)
UTM Coordinates (N-S)	3,446.730	(km)
Height above grade	107.60	(feet)
Inside diameter at exit (if opening is round) ...		(feet)
Inside area at exit (if opening is not round)	9	(sq. feet)
Base Elevation....................................	48.9	(feet)
GEP Stack Height................................	110	(feet)

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.

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N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

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