345 Woodcliff Drive
2nd Floor
Fairport, New York, 14450

T +1 585 387 0510

erm.com

Mr. Phillip Fielder
Air Quality Division, Chief Engineer
Oklahoma Environmental Quality
707 N Robinson Ave
Oklahoma, City, Oklahoma 73102
Phillip.Fielder@deq.ok.gov

DATE
9 February 2026

SUBJECT
PSD Air Permit Application
Emirates Global Aluminum

REFERENCE
0793283

Dear Mr. Fielder,

On behalf of Emirates Global Aluminum (EGA), Environmental Resources Management (ERM) is pleased to submit this Prevention of Deterioration (PSD) Air Permit Application for the planned Aluminum Smelter to be located on E 620 Road, Inola, OK 74036 at the Tulsa Ports Industrial Park in Inola, OK (Rogers County).

Consistent with our discussions, the PSD Air Permit Application is being submitted electronically via the email address provided on the Oklahoma Environmental Quality website (AQD_APU@deq.ok.gov).

EGA has elected to pursue the Expedited Air Quality Permit Pilot Program in recognition of the critical schedule requirements tied to their planned aluminum smelter construction. This cover letter and payment associated with the air permit application processing fee ($7,500), and the expedited permit program fee ($15,000) and contract is also provided via express mail.

The application includes the following components:

- Introductory information that summarizes the process and air emissions, air regulatory program requirements; and
- Appendices which include application forms, air emission calculations, a process flow diagram, a Best Available Control Technology (BACT) Assessment, and an Air Emission Dispersion Modeling Protocol for the surrounding Class 2 Area.

EGA is committed to developing a facility design that fully meets the applicable air pollution regulatory requirements. The proposed EGA facility will be subject to, and will comply with, stringent air pollution regulatory requirements including PSD BACT, and the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Primary and Secondary Aluminum Smelting Operations (also known as Maximum Achievable Control Technology (MACT) Standards).

As discussed, the information presented in the application is accurate and complete as of the date of submittal but will be refined as project design and engineering activities progress. EGA will provide updates to the application as needed to support the PSD permitting process. This will include an update to the business entity's official legal name, which is still being finalized. The entity is currently referred to in the application as EGA, and Oklahoma Aluminum, neither of which will be the final name.

Thank you in advance for your review and processing of the application. We look forward to on-going collaboration as the permitting process progresses.

Sincerely,

Jeffery H. Twaddle
Partner, Engineer

Cc: Mr. Ziad Fares, EGA
Mr. Sudip Kumar Ghosh, EGA
Ms. Noor Shahab Abdulrazaq Fikree, EGA
Mr. Gary Keating, ERM
Ms. Olga Samani, ERM
Mr. Andrew Rengel, ERM
Mr. Rob Van Kleeck, ERM

PSD Application to Construct

Oklahoma Aluminum: New Primary Aluminum Smelter

PREPARED FOR
OK Department of Environmental Quality

DATE
9 February 2026

REFERENCE
0793283

SIGNATURE PAGE

PSD Application to Construct

Oklahoma Aluminum: New Primary Aluminum Smelter

0793283

Jeffrey H. Twaddle	**Andrew Rengel**
Partner	Managing Technical Consultant

Enviromental Resources Management, Inc.
75 Valley Streem Pkwy #200
Malvern, PA 19355

T +1 484 913 0300

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronym	Description
AQD	Air Quality Division
ASI	Aluminum Stewardship Initiative
BACT	Best Available Control Technology
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CI ICE	Compression Ignition Internal Combustion Engine
COS	Carbonyl Sulfide
DEQ	Department of Environmental Quality
DSCF	Dry Standard Cubic Feet

Acronym	Description
EMS	Environmental Management System
EPA	Environmental Protection Agency
ERM	Environmental Resources Management
FGD	Flue Gas Desulfurization
FTC	Fume Treatment Center
GTC	Gas Treatment Center
HAP	Hazardous Air Pollutant
HF	Hydrogen Fluoride
ICE	Internal Combustion Engine
MACT	Maximum Achievable Control Technology
MMBtu	Million British Thermal Units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMHC	Non-Methane Hydrocarbons
NOx	Nitrogen Oxides
NSPS	New Source Performance Standards
OA	Oklahoma Aluminum
OAC	Oklahoma Administrative Code
OM&M	Operation, Maintenance, and Monitoring
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PM	Particulate Matter
PM_{10}	Particulate Matter ≤10 microns
$PM_{2.5}$	Particulate Matter ≤2.5 microns
POM	Polycyclic Organic Matter
PSD	Prevention of Significant Deterioration
PTM	Pot Tending Machine

Acronym	Description
RICE	Reciprocating Internal Combustion Engine
RTO	Regenerative Thermal Oxidizer
SO_2	Sulfur Dioxide
TF	Total Fluorides
VOC	Volatile Organic Compound

1. INTRODUCTION

Oklahoma Aluminum (OA) is proposing to build a primary aluminum smelting operation in the municipality of Inola, Rogers County, Oklahoma. The proposed location is in the Inola Industrial Park, which is developed by Tulsa Ports. Existing land cover in the proposed location is primarily pasture/hay grassland and deciduous forest. No previous industrial development has been discovered in the proposed project location.

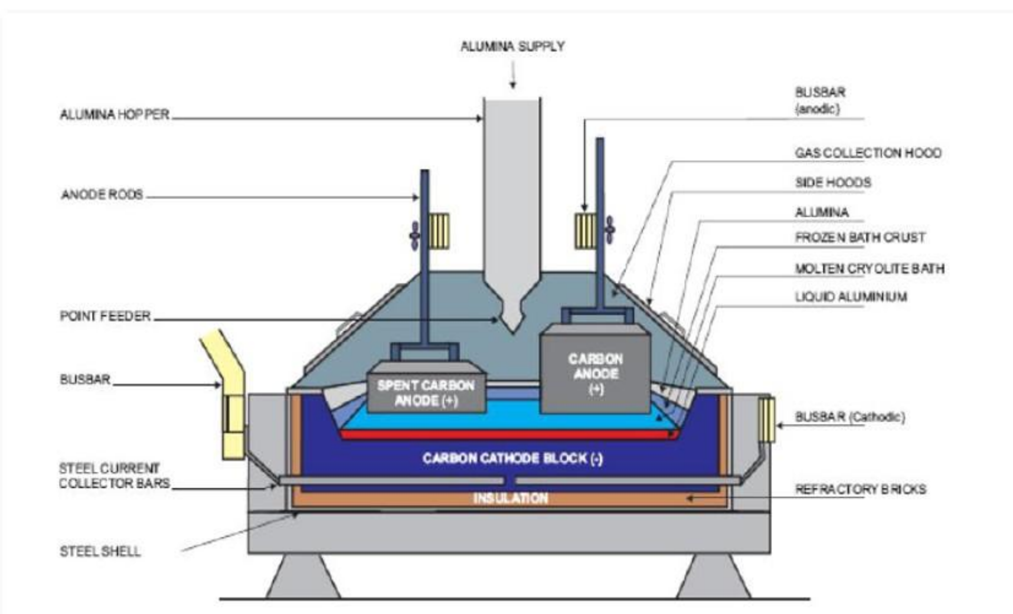
1.1 PROCESS DESCRIPTION

Aluminum metal (Al) is produced through the Hall-Héroult process, which reduces alumina (Al_2O_3) via smelting. The electrolytic reduction of Alumina can be expressed via this chemical reaction:

$$2Al_2O_3 + 3C + Energy \rightarrow 4Al + 3CO_2$$

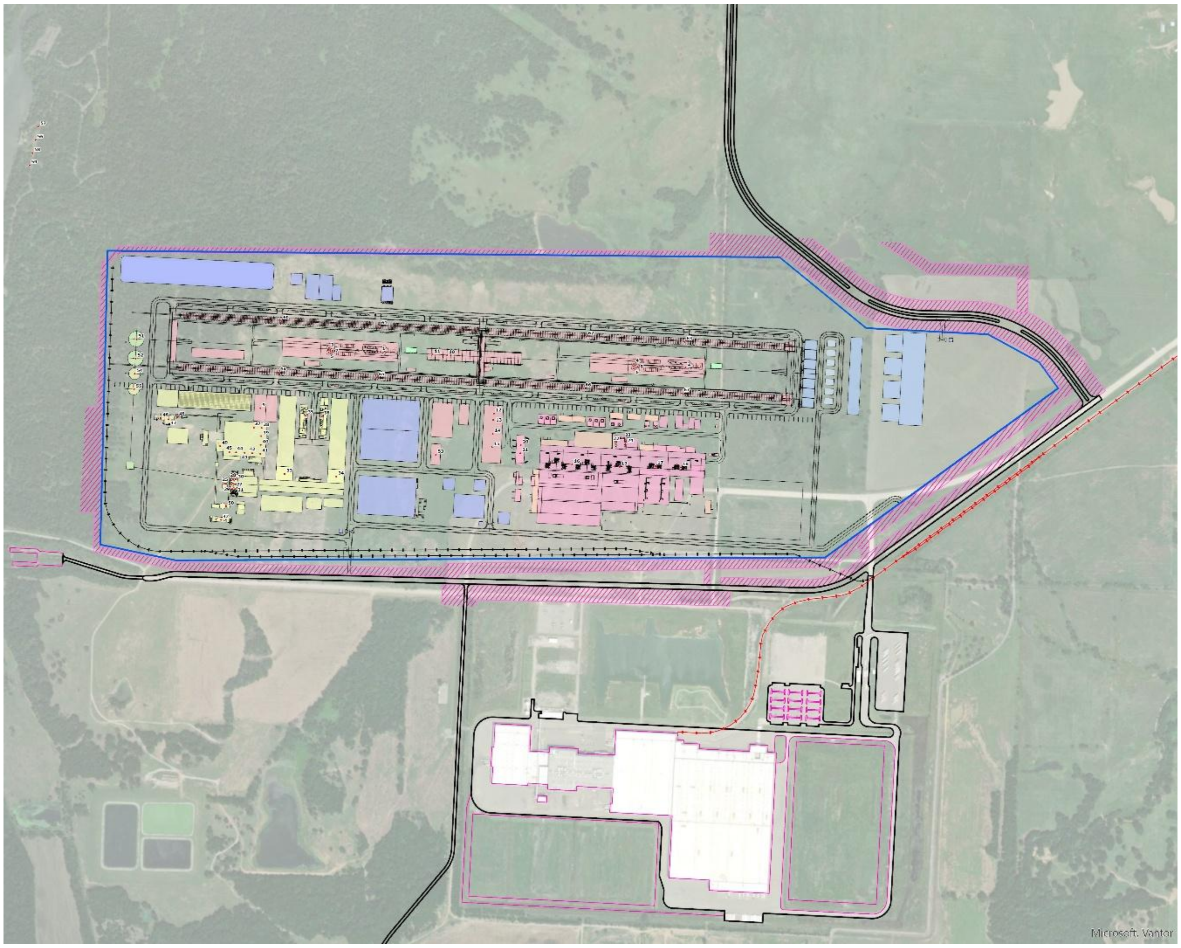
This chemical reaction occurs in the smelter pots, which are shallow rectangular cells as shown in Figure 1. The shells are made from steel and are lined with refractory bricks and carbon blocks, which form the Cathode. Anode assemblies, which are a Pre-Baked Carbon Block (the Anode), are equipped in each pot. The electrolytic reduction, as presented in the formula above, occurs between the anodes and the cathode. The anodes are suspended in the smelting pot and then a molten cryolite (Na_3AlF_6) and aluminum fluoride (AlF_3) bath is added to connect the anodes and cathode. Alumina is then added to the bath via a feeder, where it dissolves to form aluminum. The bath in the smelter forms a solid crust on its surface, it must be periodically broken to allow for alumina and aluminum fluoride to be added via a feeder. The aluminum sinks to the bottom of the pot, which can be periodically removed from the pot into a crucible for casting. Carbon from the anode blocks are consumed during the electrolytic reduction, requiring regular replacement of the anodes. The anodes are produced on-site in the carbon plant area.

FIGURE 1: ALUMINUM REDUCTION CELL



The proposed facility layout is presented in Figure 2.

FIGURE 2: PROPOSED OA FACILITY LAYOUT



1.1.1 REDUCTION AREA

The Potline (ID 0320) will be the heart of the reduction process, utilizing OA EX Pot Technology across 484 pots housed in two potroom buildings. Each potroom will contain 242 pots, split into two sections of 121 pots. Gantry passageways with embedded rails will connect the potrooms, facilitating equipment movement. Once construction is complete, the facility projects to produce 826,734 short tons (750,000 metric tons) of liquid aluminum. Production will be continuous, operating 24 hours a day, 365 days per year.

The Electrolytic Pots (ID 0322) include potshells, superstructures, and buswork. DC current will flow through aluminum busbars forming a series circuit. Each pot will be spaced 21 feet apart from the centerline of each pot and will consist of a steel potshell lined with conductive and refractory materials, a cathode lining with graphitized blocks and collector bars, and a superstructure supporting the anode system. Each pot will accommodate 48 anode assemblies, each comprising a baked carbon block, aluminum rod, steel yoke, and transition joints.

Pot Tending Equipment (ID 0323) will include overhead cranes and specialized vehicles for anode replacement, pot dressing, and aluminum tapping. Pot Tending Machines (PTMs) will perform these tasks, including siphoning molten aluminum into 16-ton crucibles. The Cathode Transport Crane (CTC) and Crane Transfer Gantry (CTG) will facilitate movement of potshells and equipment between potrooms and maintenance areas.

Fluorinated Alumina Storage and Handling (ID 0324) will involve silos located between potroom buildings. These silos will store alumina air-lifted from the Gas Treatment Centers (GTCs) and will feed it to the pots via air gravity conveyors. Each silo will support 24 hours of inventory. Crushed Bath (ID 0325) and Anode Covering Material Storage (ID 0325) and Covering Alumina Storage and Handling (ID 0326) will provide a steady supply of materials for pot operations.

The Potline Gas Treatment Center and Flue Gas Desulfurization (FGD) will capture and treat gaseous and particulate emissions from the pots. During normal operations, all pots will be vented to the GTC at a constant flow rate. During pot tending operations (material addition or aluminum tapping), the flow rate will be increased to minimize uncaptured emissions. Up to sixteen (16) pots per GTC can be vented at one time at the increased flow rate. Each pot will connect to a negative pressure ducting system leading to GTCs, where fluoride gases will be treated using fresh alumina via a dry scrubbing process in bag filter chambers. The fresh alumina solids interact with the fluoride gases to form fluorinated alumina solids. The fresh alumina is stored in silos (ID 0328) next to the GTCs. The fluorinated alumina will be recycled and stored in silos (ID 0324). Post-treatment, flue gases will pass through a semi-dry scrubbing system to treat SO_2. Two GTC/FGD units will serve the potline, each handling half of the total pots.

Finally, Potline Services will include cathode rodding (ID 0341), pot delining/relining (ID 0342), and, crucible cleaning (ID 0344) These facilities will support the operational integrity and maintenance of the potline, ensuring continuous and efficient aluminum production.

1.1.2 CARBON AREA

The Carbon Area supports the production, handling, treatment, and recycling of anodes and bath materials essential for aluminum smelting.

The process will begin with the green anode production, where raw materials such as petroleum coke and liquid pitch will be transported from storage to the Paste Plant (ID 0210). Buffer silos will be installed to maintain a two-day supply of coke and pitch (ID 0211). Recycled baked and green products from the carbon recycling facility will also be integrated into the feed. Within the paste plant, dry aggregates will be crushed, milled, and classified before being mixed with pitch in two parallel mixing lines (ID 0210). The resulting paste will be cooled and formed into anodes using vibro-compactors equipped with vacuum forming and counter-pressure systems.

Once formed, the green anodes will undergo cooling via a water-based system (ID 0213) using a power and free conveyor. After cooling, the anodes will be either sent directly to the baking furnace operating floor or diverted to a dedicated storage building. Baked anodes will be similarly stored and managed using automated stacking cranes and an anode management system.

The baked anode production will be facilitated by two anode baking furnaces (ID 0230), each comprising 52 sections arranged in two tubs. Each section will contain eight (8) pits, accommodating sets of 24 anodes. The furnaces will be equipped with fire groups for heating and exhaust management, and furnace tending assemblies will handle the loading and unloading of anodes and packing coke. To manage emissions, the Baking Furnace Fume Treatment Center (FTC) will employ a combination of a conditioning tower, followed by fluidized bed adsorption systems, and dry scrubbers. Post-baking, the anodes will be cleaned, inspected, and slot-cut (0220) before being transferred to storage. Dust and fines generated during ABF operations, baked anode cleaning and slot cutting will be collected and conveyed to the paste plant for reuse.

The anode rodding shop will process spent anode assemblies from the potline, separating bath, carbon, and cast iron for recycling (ID 0240). The cleaned rod/yoke assemblies will be then reused with new baked anodes and sealed using liquid cast iron in a casting station. A cooling water system (ID 0241-13) will cool the induction furnace used for cast iron melting. The anode rodding process will involve multiple stations including bath removal, shot blasting, butt stripping, thimble press removal, inspection, stub coating, and drying (ID 0240). Stripped cast iron will be handled using overhead cranes and melted in induction furnaces for anode rodding.

Bath treatment and storage facilities will be designed to process both standard and pure bath materials (ID-0250). Standard bath will include materials removed from anode butts, pots, and crucibles, while pure bath will consist of excess tapped bath. These materials will be crushed, sized, and stored in dedicated silos. Lump bath from various sources will be cooled and conveyed to buffer silos for further processing.

The carbon recycling facility will handle the crushing and sizing of recycled green anodes, paste, baked anodes, and carbon butts (ID 0260). These materials will be stored in separate silos and reintegrated into the paste plant for green anode production.

1.1.3 CASTHOUSE AREA

In the Casthouse area, the molten aluminum metal will be cast into various solidified products for market distribution.

The Casthouse will be designed to handle an annual liquid metal production of 826,735 tons (750,000 metric tons) and internal scraps. It will receive hot metal from the Potline and scrap melting furnaces, which will be then processed into value-added aluminum products such as extrusion billets, sheet ingots, wire rod, foundry ingots, and P1020 sow ingots. The metal will be transported in crucibles using specialized vehicles.

The central facility, the Casthouse Building and will be divided into three bays. Each bay will be equipped with cranes tailored to specific operations: three cranes in the hot metal bay, two stripping cranes and one maintenance crane in the casting bay, and two cranes in the finishing bay.

Within the Treatment of Aluminum in Crucible (TAC) facility, metal will be first skimmed, weighed, and treated before being transferred to melting and holding furnaces in the furnace area. One pair of furnaces will be natural gas-fired, tilting units will be connected to launder systems that feed water-cooled alloyed ingot casting lines (ID 0420-2). Another pair of natural gas-fired, tilting units will be connected to launder systems that feed water-cooled wire rod casting lines producing coils of wire rod (ID 0420-3). Two sets of three furnaces will be equipped with magnetic stirrers with a degassing unit, metal rod feeder, and ceramic foam filtering, feeding two Vertical Direct Chill

(VDC) casters capable of producing billet logs (ID 0420-1). One set of three furnaces equipped with magnetic stirrers with a degassing unit, metal rod feeder, and ceramic foam filtering, feeding one Vertical Direct Chill (VDC) caster producing rolling slabs/sheet ingots, and tee ingots (ID 0420-4).

The Casting Area will be equipped with advanced ingot casting machines featuring mold preheaters (ID 0430-1), casting conveyors, coating systems (ID 0430-2), cooling systems, drying fans, exhaust stacks, and automated systems for marking (ID 0430-4, 0430-5), rejecting, stacking, strapping, and weighing ingots. Sow casting equipment will include a air-cooled sow casting machine with automated tilting, skimming, and stacking systems. Casthouse product mix to include extrusion billets, sheet ingots, wire rod, foundry ingots, and P1020 sow ingots casting equipment.

Billet casting and homogenizing operations will be supported by VDC machines with casting pits, hydraulic systems, cooling water systems, and billet handling equipment. These facilities also will include continuous and batch homogenizing systems, air cooling chambers, and billet sawing and stamping stations.

Sheet ingot casting operations will be supported by VDC machines with casting pits, hydraulic systems, cooling water systems, and sheet ingot handling equipment. These facilities also will include slab sawing and stamping stations.

Sow casting operations will be supported by a casting carousel, hydraulic systems, and a sow stacking system.

Wire rod casting operations will be supported by a casting wheel, rolling train, and coil winding and packing system.

For product handling and storage, the Casthouse will include systems for preparing export super packs of ingots and billets. These packs will be stacked and strapped automatically and transported to the export metal storage area using flatbed trailers or forklifts.

Cooling water treatment (ID 0430-3, 0450) is a critical component of the Casthouse operations. A dedicated facility manages the cooling and treatment of water used in casting processes. It includes hot and cold water basins, automatic strainers, cooling towers, pumps, and valves. The system is designed to minimize evaporation losses and maintain water chemistry through environmental friendly chemical dosing and filtration systems.

Crucible skimming and treatment stations remove impurities from the metal using sodium reduction and aluminum fluoride injection (ID 0460). Three automatic skimming and weighing stations are installed, with additional weighing stations for empty crucibles post-delivery.

Dross cooling (ID 0470) is managed within the Casthouse through dross coolers and cooled dross will be sent for further processing.

Maintenance operations are supported by a facility housing tools and equipment for servicing casting machinery. Ancillary buildings include control rooms, laboratories, alloy rooms and offices for the Casthouse management team. These facilities support process monitoring, metallurgical analysis, and equipment testing.

Additional infrastructure includes minor service buildings such as alloy and scrap storage sheds, a vertical direct chill (VDC) casting mold shop, a gas skid for furnace operations, a water head tank for emergency cooling, and electrical substations to power the Casthouse and its auxiliary systems. The product stockyard, provides ample space for storing solidified aluminum products ready for shipment.

1.1.4 RAW MATERIAL STORAGE AREA

It is assumed that the materials will be received via a dedicated barge unloading facility, which will be owned by the Tulsa Port Authority but operated by OA and transported to the site using a connected conveyor system (ID 0900). The facility will include two main alumina silos, transfer conveyors, air slides and associated equipment. The fresh alumina handling and storage facility (ID 0810) will maintain a strategic inventory. Alumina will be delivered to the Gas Treatment Center silos.

Aluminum fluoride will be imported in one-ton bulker bags transported on flatbed trailers. These bags will be unloaded using forklifts and stored indoors. It is further processed through a bag breaker station before being stored in an elevated feed bin (ID 0820). This bin will then feed the aluminum fluoride transport vehicles in truck loading stations and the vehicles will carry the aluminum fluoride to the potrooms.

Petroleum coke will be stored in quantities sufficient for smelter operation. It will be transferred daily via conveyor systems to the green mill coke silos. The facility will include two main coke silos, a transfer conveyor, a bucket elevator, a buffer silo, conveying equipment to the green mill, and dust control systems to manage emissions (ID 0830).

Liquid pitch will be delivered in thermally insulated tanker trucks and pumped into main pitch tank using a dedicated pump system. From the main tank, pitch will be transported to the day pitch tank. The facility will include piping system, HTM plant, and RTO.

Lime will be offloaded from trucks into a silo using onboard pneumatic systems. The lime will be consumed in the FGD unit. Gypsum, produced from the absorbers, will be stored onsite until sold or disposed.

The finished product laydown area will accommodate the storage and handling of final products, which will be loaded onto flatbed trailers or railcars using forklifts.

1.1.5 BARGE UNLOADING AREA

The smelter’s primary inputs, such as alumina and petroleum coke, will be imported via the McClellan–Kerr Arkansas River Navigation System. Unloading operations will utilize a dual suction barge unloader, and the materials will be conveyed directly to the site’s storage silos via a conveyor system (ID 0900).

1.1.6 ANCILLARY OPERATIONS

Raw materials, by-product materials, and final products are transported throughout the facility on paved roads (ID 0120). Team member traffic and other ancillary transportation (maintenance vehicles, one-off or small deliveries) will travel along the facility roads and parking areas.

In the event of an unexpected loss of power, diesel-fired emergency generators will supply the necessary power to safely ramp down operations and maintain certain operations to avoid significant or permanent damage. One large emergency generator is expected adjacent to the Compressor Substation and at least one smaller generator is expected elsewhere in the facility.

2. AIR EMISSIONS SUMMARY

Emission calculations for the proposed emission units at the facility utilize a combination of AP-42 emission factors, federal regulatory emission limits, Best Available Control Technology (BACT) limits, engineering designs or judgement, and scaled emissions from a sister facility in Abu Dhabi, United Arab Emirates. Table 1 presents the annual potential to emit (PTE) for the facility for the criteria pollutants. Table 2 presents the annual PTE for greenhouse gases equivalents and hazardous air pollutants (HAPs).

TABLE 1: CRITERIA POLLUTANT FACILITY-WIDE PTE

EU ID	CO tpy	NOx tpy	PM tpy	PM_{10} tpy	$PM_{2.5}$ tpy	SO_2 tpy	VOC tpy
EU_01 Potline	86,533	39.9	486	293.4	177.5	781.6	183
EU_02 Potline Services	0.02	0.02	26.5	26.5	14.9	0	0
EU_03 Casthouse	15.2	16.5	18.8	22.9	15.6	1.2	13.3
EU_04 Carbon Area	630.1	252.2	85.8	79.6	47.5	735.8	14.0
EU_05 Mat. Hand. & Storage	0	0	9.7	9.7	4.9	0	0
EU_06 Roadways	0	0	101	19.8	4.9	0	0
EU_07 Emergency Generators	4.1	7.6	0.2	0.2	0.2	1.5	7.6
EU_08 Water Cooling Systems	0	0	3.1	1.4	0.01	0	0.2
Total	**87,182**	**316.2**	**731.1**	**453.7**	**265.5**	**1,520.1**	**217.6**

TABLE 2: OTHER POLLUTANTS FACILITY-WIDE PTE

EU ID	CO_2e tpy	Total F tpy	PAH tpy	HCl tpy	Total HAPs tpy
EU_01 Potline	6,936,293.9	420.9	1.9	0	184.3
EU_02 Potline Services	30.7	0	0	0	0.0
EU_03 Casthouse	1,091.3	0	0	0.7	0.9
EU_04 Carbon Area	1,014.4	4.6	12.4	0	1.9
EU_05 Mat. Hand. & Storage	0	0	0	0	0
EU_06 Roadways	0	0	0	0	0
EU_07 Emergency Power	300.0	0	0	0	0.02

EU ID	CO_2e tpy	Total F tpy	PAH tpy	HCl tpy	Total HAPs tpy
EU_08 Water Cooling Systems	0	0	0	0	0.1
Total	**6,938,730.4**	**425.5**	**14.3**	**0.7**	**187.2**

Detailed air emissions calculations are presented in Appendix B.

3. REGULATORY ANALYSIS

The following sections describe the State of Oklahoma and federal regulatory applicability for primary aluminum smelting processes proposed in this application. The regulations presented are those deemed applicable to the project, unless otherwise indicated.

3.1 STATE OF OKLAHOMA REGULATIONS

3.1.1 OAC 252:100-1 – GENERAL PROVISIONS

Subchapter 1 includes definitions but there are no regulatory requirements.

3.1.2 OAC 252:100-2 – INCORPORATION BY REFERENCE

This subchapter incorporates by reference applicable provisions of 40 CFR. These requirements are addressed in the "Federal Regulations" section.

3.1.3 OAC 252:100-3 – INCORPORATION BY REFERENCE

Subchapter 3 enumerates the primary and secondary ambient air quality standards and the PSD increments. The Primary Standards are in Appendix E and the Secondary Standards are in Appendix F of the Air Pollution Control Rules. At this time, all of Oklahoma is in attainment of these standards.

3.1.4 OAC 252:100-5 – REGISTRATION, EMISSION INVENTORY AND ANNUAL OPERATING FEES

Subchapter 5 requires sources of air contaminants to register with DEQ's Air Quality Division (AQD), file emission inventories annually, and pay annual operating fees based upon total annual emissions of regulated pollutants. The owner/operator will be required to submit emissions inventories and pay the appropriate fees.

3.1.5 OAC 252:100-8 – PERMITS FOR PART 70 SOURCES AND MAJOR NEW SOURCE REVIEW (NSR) SOURCE

Part 5 includes the general administrative requirements for Part 70 permits. Any planned changes in the operation of the facility that result in emissions not authorized in the permit and which exceed the "Insignificant Activities" or "Trivial Activities" thresholds require prior notification to AQD and may require a permit modification. Insignificant activities mean individual emission units that either are on the list in Appendix I (OAC 252:100) or whose actual calendar year emissions do not exceed the following limits:

- 5 TPY of any one criteria pollutant
- 2 TPY of any one hazardous air pollutant (HAP) or 5 TPY of multiple HAP or 20 percent of any threshold less than 10 TPY for a HAP that EPA may establish by rule

Emission limitations and operational requirements necessary to assure compliance with all applicable requirements for all sources are based on information in the application and current operating permit, or developed from the applicable requirements.

Section 8-4 requires a construction permit prior to the following:

- Construction of a new source that would require an operating permit under 40 CFR Part 70;
- Reconstruction of a major HAP source under 40 CFR Part 63;
- Any physical change or change in method of operation that would be a significant modification under OAC 252:100-8-7.2(b)(2); or
- Any physical change or change in method of operation that would increase the PTE of any one regulated air pollutant by more than 10 TPY, calculated using the approach in 40 CFR § 49.153(b).

Part 7 A review was completed for all regulated NSR pollutants for the OA project which will result in potential emissions greater than the major stationary source threshold of 100 tpy (NOx, CO, VOC, PM, PM_{10}, $PM_{2.5}$, and SO_2).

3.1.6 OAC 252:100-9 – EXCESS EMISSION REPORTING REQUIREMENTS

Except as provided in OAC 252:100-9-7(a)(1), the owner or operator of a source of excess emissions shall notify the Director as soon as possible but no later than 4:30 p.m. the following working day of the first occurrence of excess emissions in each excess emission event. No later than thirty (30) calendar days after the start of any excess emission event, the owner or operator of an air contaminant source from which excess emissions have occurred shall submit a report for each excess emission event describing the extent of the event and the actions taken by the owner or operator of the facility in response to this event. Request for mitigation, as described in OAC 252:100-9-8, shall be included in the excess emission event report. Additional reporting may be required in the case of ongoing emission events and in the case of excess emissions reporting required by 40 Code of Federal Regulations (CFR) Parts 60, 61, or 63.

3.1.7 OAC 252:100-13 – OPEN BURNING

Open burning of refuse and other combustible material is prohibited except as authorized in the specific examples and under the conditions listed in this subchapter.

3.1.8 OAC 252:100-19 – CONTROL OF EMISSION OF PARTICULATE MATTER

No discharge of particulate matter resulting from the combustion of fuel in any new or existing fuel-burning unit shall not exceed the following limits:

- 0.60 lb/MMBtu for units with a maximum heat input less than 10 MMBtu/hr

- E = 1.0428080 * X^-0.238561 where X is greater than 10 MMBtu/hr but less than 1,000 MMBtu/hr
- E = 1.60 * X^-0.30103 where X is greater than 1,000 MMBtu/hr but less than 10,000 MMBtu/hr
- 0.10 lb/MMBtu for units with a maximum heat input greater than 10,000 MMBtu/hr.

No discharge of particulate matter resulting from an industrial process shall not exceed the following limits:

- E = 4.10 * P^0.67 for process weight rates (P) of 30 tons per hour or less
- E = (55 * P^.11) -40 for process weight rates (P) greater than 30 tons per hour.

3.1.9 OAC 252:100-25 – VISIBLE EMISSIONS AND PARTICULATES

No discharge of greater than 20% opacity is allowed except for short-term occurrences which consist of not more than one six-minute period in any consecutive 60 minutes, not to exceed three such periods in any consecutive 24 hours. In no case shall the average of any six-minute period exceed 60% opacity. The permit will require that any on-site equipment be fueled only with natural gas to demonstrate compliance with this requirement.

3.1.10 OAC 252:100-29 – CONTROL OF FUGITIVE DUST

No person shall cause or permit the discharge of any visible fugitive dust emissions beyond the property line on which the emissions originate in such a manner as to damage or to interfere with the use of adjacent properties, or cause air quality standards to be exceeded, or interfere with the maintenance of air quality standards. Under normal operating conditions, this facility will not cause a problem in this area; therefore, it is not necessary to require specific precautions to be taken.

3.1.11 OAC 252:100-31 – CONTROL OF EMISSION OF SULFUR COMPOUNDS

No person shall cause or permit the discharge of SO_2 emissions from new gaseous fuel combusting sources greater than 0.2 lb/MMBtu heat input.

Emissions of H_2S from any facility shall not cause an ambient air concentration greater than 0.2 ppm at standard conditions, 24-hour average. No H_2S emissions are anticipated from the project.

3.1.12 OAC 252:100-33 – CONTROL OF EMISSION OF NITROGEN OXIDES

No discharge of NO_x resulting from the combustion of fuel in any new or existing fuel-burning unit shall not exceed the following limits: 0.20 lb/MMBtu, three-hour average for units with a maximum heat input greater than 50 MMBtu/hr.

3.1.13 OAC 252:100-37 – CONTROL OF EMISSION OF VOLATILE ORGANIC COMPOUNDS (VOCS)

Storage vessels of VOCs with a capacity of 400 gallons or more shall be equipped with a permanent submerged fill pipe or a vapor recovery system capable of collecting 85% or more of the uncontrolled VOCs.

3.1.14 OAC 252:100-42 – CONTROL OF TOXIC AIR CONTAMINANTS

This subchapter regulates toxic air contaminants (TAC) that are emitted into the ambient air in areas of concern (AOC). Any work practice, material substitution, or control equipment required by ODEQ prior to June 11, 2004, to control a TAC, shall be retained unless a modification is approved by the ADQ Director. Because no AOC has been designated anywhere in the state, there are no specific requirements for this facility at this time.

3.1.15 OAC 252:100-43 – TESTING MONITORING AND RECORDKEEPING

This subchapter provides general requirements for testing, monitoring and recordkeeping and applies to any testing, monitoring or recordkeeping activity conducted at any stationary source. To determine compliance with emissions limitations or standards, the Air Quality Director may require the owner or operator of any source in the state of Oklahoma to install, maintain and operate monitoring equipment or to conduct tests, including stack tests, of the air contaminant source. All required testing must be conducted by methods approved by the Air Quality Director and under the direction of qualified personnel. A notice-of-intent to test and a testing protocol shall be submitted to Air Quality at least 30 days prior to any EPA Reference Method stack tests.

Emissions and other data required to demonstrate compliance with any federal or state emission limit or standard, or any requirement set forth in a valid permit shall be recorded, maintained, and submitted as required by this subchapter, an applicable rule, or permit requirement. Data from any required testing or monitoring not conducted in accordance with the provisions of this subchapter shall be considered invalid. Nothing shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

TABLE 3: NONAPPLICABLE OAC RULES

Regulation	Regulation Title	Reason
OAC 252:100-11	Alternative Emissions Reduction Plans and Authorizations	Not Requested
OAC 252:100-17	Incinerators	Not type of emission unit
OAC 252:100-23	Control of Emissions from Cotton Gins	Not type of emission unit
OAC 252:100-24	Particulate Matter Emissions form Grain, Feed or Seed Operations	Not in source category
OAC 252:100-39	Emission of Volatile Organic Compounds (VOCs) in Nonattainment Areas and Former Nonattainment Areas	Not in area category
OAC 252:100-47	Control of Emissions from Existing Municipal Solid Waste Landfills	Not in source category
OAC 252:100-49	Oklahoma Emission Reduction Technology Rebate Program	Not in source category

3.2 FEDERAL REGULATIONS – NEW SOURCE PERFORMANCE STANDARDS (NSPS)

NSPS are developed for particular industrial categories. 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. The NSPS regulations may be found in 40 CFR 60 and 63. An owner or operator of an affected facility may elect to comply with requirements of 40 CFR 60 Subpart S or the requirements of CFR 63 subpart LL. An analysis of potentially applicable NSPS subparts is presented below.

3.2.1 40 CFR 60 SUBPART A – GENERAL PROVISIONS

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

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

3.2.2 40 CFR 60 SUBPART S – STANDARDS OF PERFORMANCE FOR PRIMARY ALUMINUM REDUCTION PLANTS

NSPS Subpart S applies to potroom groups and anode bake plants that are built or modified after October 23, 1974. The proposed facility will have two potroom groups and have an anode bake plant, which be regulated by Subpart S. The applicable requirements are listed in Table 4 below.

TABLE 4: 40 CFR PART 60 SUBPART S APPLICABLE REQUIREMENTS

Description	**Citation**	**Requirements**
Standard for Fluorides	60.192(a)(2) 60.192(a)(3)	• 1.9 lb/ton of aluminum produced for potroom groups at prebake plants; except that emissions between 1.9 lb/ton and 2.5 lb/ton will be considered in compliance if exemplary operation and maintenance of control systems are demonstrated and were operational during the test. • 0.1 lb/ton of aluminum equivalent for anode bake plants
Standard for Visible Emissions	60.193	• Opacity limited to less than 10% for potroom groups • Opacity limited to less than 20% for anode bake plants

Description	Citation	Requirements
Monitoring of Operations	60.194	• Maintain and operate monitoring devices which can be used to determine daily weight of aluminum and anode produced to ±5%accuracy. • Maintain daily production rates of aluminum and anodes, raw material feed rates, and cell or potline voltages. • After the initial performance test, perform monthly performance tests.
Test Methods	60.195	• Use reference methods and procedures of Appendix A of 40 CFR Part 60 for performance tests. • Methods 13A or 13B shall be used for processes with stacks to determine the total fluorides concentration and volumetric flow rates. • Method 14 shall be used for roof monitor emissions to determine the total fluorides concentration and volumetric flow rates. • Potroom groups shall test for at least 8 hours and 240 dscf. Anode bake plants shall test for at least 4 hours and 120 dscf. • Utilize the formulas in 60.195(b) for determining compliance. • Opacity testing shall follow Method 9.

In accordance with 40 CFR 60 Subpart A, 60.8(a), the initial performance tests must be performed within 60 days of achieving the maximum production rate of the facility, but no later than 180 days after initial startup.

OA will petition to establish an alternative testing requirement per 40 CFR 60.194(d). This alternative testing requirement will be proposed as one performance test per year at the potline gas treatment centers and the anode bake furnace instead of the monthly requirement. This schedule has been proposed and accepted for the Anaconda Aluminum Company's Sebree plant and Alumax of South Carolina's Mt. Holly Plant. OA anticipates that the operating schedule and process operations as designed will demonstrate the necessary stability in emissions on a day-to-day basis, which is necessary for allowing an annual testing schedule.

3.2.3 40 CFR 60 SUBPART TT – STANDARDS OF PERFORMANCE FOR METAL COIL SURFACE COATING

NSPS Subpart TT applies to prime coating operations, finish coating operations, and certain combined prime and finish coat operations at metal coil surface coating operations constructed, modified, or reconstructed after January 5, 1981.

Per 40 CFR 60.461, the definition of a metal coil surface coating operation:

> *"…the application system used to apply an organic coating to the surface of any continuous metal strip with thickness of 0.15 millimeter (mm) (0.006 in.) or more that is packaged in a roll or coil."*

Marking operations associated with this process do not apply to this facility as it does not meet the application system parameters in the definition for metal coil surface coating.

3.2.4 40 CFR 60 SUBPART IIII – STANDARDS OF PERFORMANCE FOR STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES

The provisions of this subpart are applicable to owners and operators or stationary compression ignition (CI) internal combustion engines (ICE) that commence construction after July 11, 2005. Per 40 CFR 60.4219, stationary CI ICE are defined as:

> *"…any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work and is not mobile. Stationary ICE differ from mobile ICE in that a stationary internal combustion engine is not a nonroad engine as defined at 40 CFR 1068.30 (excluding paragraph (2)(ii) of that definition), and is not used to propel a motor vehicle, aircraft, or a vehicle used solely for competition. Stationary ICE include reciprocating ICE, rotary ICE, and other ICE, except combustion turbines."*

The OA facility proposes to operate several stationary diesel-fired emergency compressor engines that meet the definition of a CI ICE with construction/order dates after July 11, 2005 and manufacture dates after April 1, 2006 (emergency engines) or July 1, 2006 (fire pumps). These engines and their applicable requirements are presented in Table 5 below.

TABLE 5: 40 CFR PART 60 SUBPART IIII APPLICABLE REQUIREMENTS

Source Description	**Model Year**	**NSPS IIII Applicable Regulations**	**NSPS IIII Emission Standards**
Compressor Station Emergency Generator		60.4205(d)(2) 60.4205(d)(3) Appendix I to Part 1039	• 4.0 g/kW-hr – NOx + NMHC • 0.2 g/kW-hr – PM • 3.5 g/kW-hr - CO
Small Emergency Generator		60.4205(d)(2) 60.4205(d)(3) Appendix I to Part 1039	• 4.0 g/kW-hr – NOx + NMHC • 0.2 g/kW-hr – PM • 3.5 g/kW-hr - CO

As required by 40 CFR 60.4209(a), the emergency generators will be equipped with a non-resettable hour meter.

Under Subpart IIII, applicable emergency generators will be required to operate as stationary emergency ICE as defined by the criteria in 40 CFR 60.4211(f)(1-3). The emergency engine may be operated for a maximum of 100 hours per calendar year for the purposes of maintenance checks and readiness testing. Additionally, the emergency engine may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance.

3.3 FEDERAL REGULATIONS – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

NESHAP are found in 40 CFR Part 63. These emission standards regulate HAP emissions from major sources (Maximum Achievable Control Technology (MACT) Standards). A facility is classified as a major source of HAP if the facility has the potential to exceed major source thresholds of 10 tpy of a single HAP and 25 tpy of aggregate HAP. Primary aluminum reduction facilities emit HAP from four basic processes: Pitch storage tanks, paste production plants, anode bake furnaces, and potlines. Operators form anode paste in the paste production plant from a mixture of petroleum coke and pitch. In a prebake facility, this anode paste is then formed into anodes and baked in an anode bake furnace. Operators subsequently place these "prebaked" anodes into a prebake potline where they are consumed via the electrolytic reduction process.

The OA aluminum smelter in Inola, Oklahoma has the potential to emit HAP above the major source threshold and is therefore considered a major source of HAP. An analysis of potentially applicable NESHAP subparts is presented below.

3.3.1 GENERAL PROVISIONS

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

3.3.2 40 CFR 63 SUBPART LL – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PRIMARY ALUMINUM REDUCTION PLANTS

As mentioned in Section 2.1 of NSPS above, the applicability of this subpart is determined by the owner or operator of the facility:

> *"(c) An owner or operator of an affected facility (potroom group or anode bake furnace) under § 60.190 of this chapter may elect to comply with either the requirements of § 63.845 of this subpart or the requirements of subpart S of part 60 of this chapter."*

Whereas Subpart S outlines the emissions limits for potrooms and anodes, this Subpart covers more source categories under 63.844:

TABLE 6: 40 CFR PART 63 SUBPART LL APPLICABLE EMISSION LIMITS

Source Category	**Requirement**
Potlines	• Emissions of TF shall not exceed 0.6 kg/Mg (1.2 lb/ton) of aluminum produced • Emissions of POM from potlines must not exceed 0.39 kg/Mg (0.77 lb/ton) of aluminum produced • Emissions of PM from potlines must not exceed 2.45 kg/Mg (4.9 lb/ton) of aluminum produced

Source Category	Requirement
Paste Production Plant	• Emissions of PM shall not exceed 0.0028 kg/Mg (0.0056 lb/ton) of green anode
Anode Bake Furnaces	• Emissions of TF shall not exceed 0.01 kg/Mg (0.02 lb/ton) of green anode • Emissions of POM shall not exceed 0.025 kg/Mg (0.05 lb/ton) of green anode • Emissions of PM shall not exceed 0.035 kg/Mg (0.07 lb/ton) of green anode • Emissions of mercury shall not exceed 1.7 µg/dscm
Pitch Storage Tanks	• Each pitch storage tank shall be equipped with an emission control system designed and operated to reduce inlet emissions of POM by 95 percent or greater
COS Limit	• Emissions of COS must not exceed 1.55 kg/Mg (3.1 lb/ton) of aluminum produced for each potline

"(f) At all times, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records and inspection of the source"

In accordance with 40 CFR Part 63 Subpart LL 63.846(a), compliance with the emission limits in Table 6 above is demonstrated using the averaging procedures of this subpart. In accordance with 40 CFR Part 63 Subpart LL 63.846(b), semiannual average emissions of TF, POM, and PM for potline groups shall be calculated based on the total primary emissions (emissions from the primary control system, i.e. gas treatment center) and total secondary emissions (emissions from the roof vents) divided by the quantity of aluminum produced during the period. To determine compliance with the applicable emission limit in Table 1 of this subpart for TF emissions, the owner or operator shall determine the average emissions (in lb/ton) from each potline from at least three runs per potline semiannually for TF secondary emissions and at least three runs per potline primary control system each year using the procedures and methods in 63.847 and 63.849. The average emissions from the primary and secondary emissions are combined and the total emissions are divided by total aluminum production. Per 63.848(a), the duration of each run for secondary emissions must represent a complete operating cycle. Potline emissions shall be recorded as the sum of the average of at least three runs from the primary control system and the average of at least three runs from the roof monitor or secondary emissions control device. The owner or operator shall monitor emissions of TF and PM from each potline by conducting annual performance tests on the primary control system and semiannual performance tests on the secondary emissions. Per 63.848(b), the owner or operator must monitor emissions of POM from each potline stack annually and secondary potline POM emissions semiannually. The duration of each run for secondary emissions must represent a complete operating cycle. The primary control system must be sampled over an 8-hour period, unless site-specific factors dictate an alternative sampling time subject to the approval of the regulatory authority.

As an alternative to semiannual monitoring of TF, POM, or PM secondary emissions from each potline using the standard methods in §63.849, the owner or operator may monitor one potline using approved test methods to represent similar potlines, provided the others are monitored using an alternative method that meets regulatory requirements. Potlines are considered similar if their structure, operability, and emissions characteristics are substantially equivalent. To demonstrate equivalency, the owner or operator must conduct simultaneous tests using both the standard and alternative methods, demonstrate compliance with applicable emission limits, and establish an alternative emission limit based on at least nine simultaneous runs. Approved alternatives include HF continuous emission monitoring systems or other methods meeting Method 14 criteria. The owner or operator must submit all test results and supporting documentation for regulatory approval, and once approved, perform semiannual monitoring using the alternative method to demonstrate compliance for each similar potline.

In accordance with 40 CFR Part 63 Subpart LL 63.846(c), compliance with the emission limits in Table 6 above for anode bake furnaces shall be demonstrated through determination of the TF, POM, and/or PM emissions from the control device at least once each year using the procedures and methods in 63.847 and 63.849. Per 63.848(c), the owner or operator shall determine TF, PM, Hg and POM emissions from each anode bake furnace on an annual basis. The owner or operator shall compute and record the annual average of TF, PM, Hg and POM emissions from at least three runs to determine compliance with the applicable emission limits. A minimum of four dscm per run must be collected for monitoring of Hg emissions.

Per 40 CFR Part 63 Subpart LL 63.846(d), the facility must develop and submit an implementation plan for emission averaging to the applicable regulatory authority for review and approval at least six months prior to the date the facility intends to comply with the emission averaging limits. The contents of the plan shall include identification of all emission sources in the average, the assigned emission limit for TF, POM, and/or PM for each averaging group of sources, and identification of the specific control technologies for each emission source in the averaging group and if those control technologies control emissions from other sources. The implementation plan shall also include the test plan for the measurement of TF, POM, and/or PM emissions in accordance with the requirements in 63.847(b), the operating parameters being monitored for each control system or device and a description of how the operating limits will be determined, and if an alternative operating parameter for monitoring is proposed, it must be fully justified. All compliance demonstrations shall be achieved under representative operating conditions.

The implementation plan shall not include any of the provisions included in 63.847(b)(4). The term of the implementation plan shall be for the term of the operating permit. While under the plan, the operator shall monitor the operating parameters, keep records, and submit periodic reports for each source subject to this subpart.

Per Section 63.847(a)(4), the compliance date for the proposed facility is upon startup. The owner or operator must prepare a site-specific test plan before the initial performance test, per 63.847(b), following §63.7(c) requirements. This plan should outline procedures for conducting both initial and subsequent performance tests for emission monitoring as required by 63.848. It must include these items: at least three annual runs for the primary control system; representative sampling for sources with multiple stacks or control devices; sampling of single stacks for multiple anode bake furnaces; rotating or representative sampling for roof scrubbers; and scheduling tests so that one run occurs before and one after the 15th of the month, with at least six days between two runs, or an alternate schedule approved by the regulatory authority.

Per Section 63.847(c)After the site-specific test plan is approved, the owner or operator must conduct a performance test to demonstrate initial compliance following the procedures in paragraph (d). If a performance test was completed within the previous 12 months for the primary control system or applicable equipment (potlines, anode bake furnace, paste production plant, or pitch storage tank), those results may be used for initial compliance. Otherwise, the performance test must occur within specific timeframes: during the first month after the compliance date for existing sources; within 180 days of startup for a potline or potroom group; by the 45th day after the second anode bake cycle (but no later than 180 days after furnace startup); within 30 days of startup for a pitch storage tank; and within 30 days of startup for a paste production plant when green anodes are first produced.

Per Section 63.847(d), performance tests, including the initial and all subsequent tests, must follow the general provisions in subpart A, the approved site-specific test plan, and the procedures in this section. Tests must be conducted under conditions specified by the Administrator to reflect representative source performance, and records must be provided upon request. For potlines, the owner or operator must measure and record TF, POM, and PM emissions from the primary control system and secondary emissions from roof monitors or scrubbers, calculating the average of at least three runs semiannually for secondary emissions and annually for the primary system to demonstrate compliance with applicable limits. For anode bake furnaces, TF, POM, PM, and Hg emissions must be measured and averaged over at least three runs annually to confirm compliance. If multiple tests of primary control devices were conducted in the previous 12 months, the average of all runs during that period must be used to determine the primary system’s contribution.

Per Section 63.847(f), for paste production plants, initial compliance with POM standards for both existing and new facilities is demonstrated through site inspections and record reviews by the regulatory authority. Additionally, the owner or operator must measure and record PM emissions from the exhaust stacks of the primary control system, compute the average of at least three runs annually using the specified equation, and confirm that PM emission rates are less than or equal to the applicable limits in §§63.843(b)(4) and 63.844(b)(2).

Per Section 63.847(g), for pitch storage tanks, initial compliance with the standards in §§63.843(d) and 63.844(d) must be demonstrated either through a design evaluation or a performance test, with all required information submitted for regulatory approval. The submission must include parameters to be monitored for proper operation and maintenance, the rationale for their selection, and monitoring frequency. If a design evaluation is used, documentation must show that the control device achieves the required efficiency under maximum expected loading conditions, including details on gas stream characteristics and additional specifications for control devices such as thermal incinerators, enclosed combustion devices, carbon adsorbers, and condensers. If the tank vents to a paste production plant control system, compliance documentation for that system may suffice. For performance tests, the owner or operator must determine POM control efficiency during tank loading using Method 315 and provide identification of the tank, control device, and any shared emission points included in the test.

Per Section 63.847(h), the owner or operator must establish operating limits and monitoring frequency for each control device as required by 63.848(f). For potlines and anode bake furnaces, upper and/or lower operating limits for each monitoring device must be based on data from the initial performance test and historical performance test data. For paste production plants, the owner or operator must specify the parameters to be monitored, provide the rationale for their selection, and define associated operating limits. Operating limits may be redetermined using historical data or other information, but any changes require regulatory authority approval before becoming effective.

Per Sections 63.847(k), (l), (m), for startup periods, the owner or operator must develop written startup plans for potlines, anode bake furnaces, and paste production plants, with compliance verified through site inspections and record reviews by the regulatory authority. The potline startup plan must follow procedures outlined in 63.854(b). The anode bake furnace plan must include a startup schedule, records of time, date, duration, and any nonroutine actions, verify the emission control system is operating within normal limits before startup, and require immediate shutdown if the control system goes offline, with restart allowed only after normal operation resumes. Similarly, the paste production plant plan must include records of startup details, require the emission control system to be operating within normal limits prior to startup, and mandate immediate shutdown if the control system is offline, with restart permitted once normal operation is restored.

Per Section 63.848(f), the owner or operator must install, operate, calibrate, and maintain a continuous parameter monitoring system for each emission control device and submit for regulatory approval a description of the monitored parameters, operating limits, monitoring frequency, and the rationale for their selection. Required monitoring devices include: alumina and air flow for dry alumina scrubbers; coke and air flow for dry coke scrubbers; water and air flow for wet scrubbers; voltage and secondary current for electrostatic precipitators; and total water flow for wet roof scrubbers, with daily inspections recorded. For sources using bag leak detection systems, alarms must not exceed 5% of process operating time over six months. For sources using PM continuous emission monitoring systems (CEMS), compliance must be demonstrated based on a rolling 30-day average of valid data, ensuring emissions remain at or below applicable limits in §§63.843, 63.844, or 63.846.

Per Section 63.848(f), for sources subject to PM limits, new or reconstructed affected sources must comply with either bag leak detection system requirements or PM CEMS requirements under paragraphs (f)(6) or (f)(7). Existing affected sources equipped with a control device and subject to PM limits must either install and operate a bag leak detection system, install and operate a PM CEMS, or conduct twice-daily visual inspections of each fabric filter exhaust stack using Method 22 for visible emissions. If abnormal emissions are observed, corrective actions must begin within one hour, including isolating, shutting down, and inspecting the baghouse compartment responsible for the abnormal operation.

Per Section 63.848(h) and (i), if a monitoring device for a primary control system records an operating parameter outside its established limit, if visible emissions indicating abnormal operation are observed from a control device exhaust stack, or if a problem is detected during a daily inspection of a wet roof scrubber, the owner or operator must initiate corrective action within one hour; failure to do so or to resolve the issue constitutes a violation. Additionally, if an operating parameter limit is exceeded six times within any semiannual reporting period, every subsequent exceedance during that period is considered a violation, with no more than one exceedance counted per 24-hour period.

Per Section 63.848(j) and (k), the owner or operator of any new or existing potline or anode bake furnace must install, operate, and maintain a monitoring device to record the daily weight of aluminum produced and the weight of green anode material placed in the furnace. The green anode weight may be determined by weighing all anodes or by counting the number of anodes and applying an average weight based on representative samples. Additionally, the owner or operator must submit recommended accuracy requirements for regulatory approval, certify that all monitoring devices meet these accuracy standards, and demonstrate they are calibrated according to the manufacturer’s instructions.

Per Section 63.848(n), the owner or operator shall monitor PM emissions from each paste production plant on an annual basis. The owner or operator shall compute and record the annual average of PM emissions from at least three runs to determine compliance with the applicable emission limits. The owner or operator must include all valid runs in the annual average.

Per Section 63.848(o), for new affected sources subject to PM limits, a bag leak detection system must be installed, operated, and maintained unless a PM CEMS is used. The owner or operator must develop written maintenance procedures, including a preventive maintenance schedule consistent with manufacturer recommendations, and a corrective action plan for alarms. Each bag leak detection system must meet specific requirements: it must detect PM concentrations of 1.0 mg/dscm or less, provide relative PM loadings, include an alarm for increased particulate levels, and be installed downstream of the PM control device. The system must be calibrated and operated per manufacturer specifications, with initial adjustments to establish baseline output, sensitivity, and alarm settings. Sensitivity adjustments are limited unless preceded by a full inspection confirming proper operation.

The corrective action plan must specify steps to address alarms within one hour, including determining the cause and implementing corrective measures such as inspecting for leaks or damaged filter elements, sealing or replacing defective bags, repairing the control device, cleaning the detection probe, or shutting down the process if necessary. These requirements provide for continuous monitoring and prompt response to minimize particulate emissions and maintain compliance.

Per Section 63.848(p), if using a Continuous Emissions Monitoring System (CEMS) to measure particulate matter (PM) emissions, the owner or operator must install, certify, operate, and maintain the system in compliance with applicable requirements. This includes conducting a performance evaluation according to §60.13 and Performance Specification 11 in 40 CFR part 60, Appendix B; performing correlation testing by collecting concurrent data from the CEMS and Method 5, 5D, or 5I performance tests; and operating and maintaining the system under Procedure 2 in 40 CFR part 60, Appendix F. Additionally, Relative Response Audits must be completed annually, and Response Correlation Audits every three years to demonstrate ongoing accuracy and compliance.

Per Section 63.849, the following Appendix A to Part 60 test methods shall be used to demonstrate compliance with the applicable emission limits for TF, POM, PM, Ni, As, Hg, PCB and conduct visible emissions observations. The pollutant-specific methods and applications are defined in 63.849(a). For sampling using Method 14 in appendix A to part 60 of this chapter, the owner or operator shall install one Method 14 manifold per potline in a potroom that is representative of the entire potline, and this manifold shall meet the installation requirements specified in section 2.2.1 of Method 14 in appendix A to part 60 of this chapter. The owner or operator must use either ASTM D4239-14e1 or ASTM D6376-10 (incorporated by reference; see 63.14) for determination of the sulfur content in anode coke shipments to determine compliance with the applicable emission limit for COS emissions.

Per Section 63.850(a), the owner or operator must submit several written notifications, including: when an area source becomes a major source; when a source is subject to the standard before or after its effective date; for new or reconstructed sources regarding construction, anticipated and actual startup dates; notification of initial performance test and initial compliance status; intent to use an HF continuous emission monitor; and compliance approach, including an engineering plan if requested to address capture efficiency for hazardous air pollutants.

Per Section 63.850(b), performance test results must be submitted within 60 days after the date of completing each test. When using EPA's Electronic Reporting Tool (ERT) supported test methods, submission of the test results to EPA via Compliance and Emissions Data Reporting Interface (CEDRI).

Per Section 63.850(c), performance evaluation reports must be submitted within 60 days after the date of completing each continuous emissions monitoring system performance evaluation. For ERT test methods, the report is to be submitted via CEDRI.

Per Section 63.850(d), the owner or operator must submit semiannual reports to the Administrator or designated authority. These reports must include excess emissions information as required by 63.10(e)(3), detailing any measured emissions that exceeded applicable standards, and malfunction reports describing the number, duration, and type of malfunctions that occurred during the reporting period, along with actions taken to minimize emissions and correct the malfunction in accordance with 63.843(f) and 63.844(f). Quarterly reporting may be required if excess emissions occur frequently.

Per Section 63.850(e), the owner or operator must retain each record for at least 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. The most recent 2 years of records must be retained at the facility. The remaining 3 years of records may be retained offsite. The required records retained include those established in Section 63.850(e)(4).

Per Section 63.854(a), during all operating periods other than startup, owners or operators of new or existing primary aluminum reduction sources must ensure that potline scrubbers, exhaust fans, and the primary capture and control system are fully operational at all times. Hood covers must be promptly replaced after potroom operations and inspected daily to confirm proper fit and condition. Daily potline inspections must identify unstable pots within 12 hours, reduce cell temperatures as practicable, follow the high-temperature operating plan, and reseal broken pot crusts promptly. Adjustable damper systems must increase exhaust rates when hood covers are removed without overloading the system. Dust entrainment during material handling and aisle sweeping must be minimized, and only tapping crucibles with functional aspirator air return systems may be used unless an alternative is approved by the regulatory authority.

Per Section 63.854(b), during startup of a new or existing primary aluminum reduction potline, the owner or operator must develop a potline startup schedule, maintain records of the number of pots started each day, and perform daily inspections to adjust pot parameters to their optimum levels as specified in the operating plan. The operating plan must include procedures to minimize emissions during startup and define a high-temperature limit that triggers corrective action, covering parameters such as alumina addition rate, exhaust airflow, cell voltage, feeding level, anode current, and bath levels.

3.3.3 40 CFR 63 SUBPART ZZZZ – NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. The proposed facility will have engines subject to this subpart as they will be considered new engines that were constructed after December 19, 2002 (>500 bHP) and after June 12, 2006 (≤500 bHP). The proposed engines with bHP >500 do not have to meet the requirements of Subpart ZZZZ except for the initial notification requirements of 63.6645(f) per 63.6590(b)(1). The proposed engines with bHP ≤500 bHP meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR Part 60 Subpart IIII per 63.6590(c). The affected engines are presented in Table 7 below.

TABLE 7: 40 CFR PART 63 SUBPART ZZZZ AFFECTED ENGINES

Engine ID	Manufacture Date	Design Capacity	Fuel Type
TBD	TBD	TBD	TBD
TBD	TBD	TBD	TBD

3.3.4 40 CFR 63 SUBPART RRR—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SECONDARY ALUMINUM PRODUCTION

40 CFR 63 Subpart RRR establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from secondary aluminum production. 63.1503 defines a secondary aluminum production facility as:

> *"…any establishment using clean charge, aluminum scrap, or dross from aluminum production, as the raw material and performing one or more of the following processes: scrap shredding, scrap drying/delacquering/decoating, thermal chip drying, furnace operations (i.e., melting, holding, sweating, refining, fluxing, or alloying), recovery of aluminum from dross, in-line fluxing, or dross cooling. A secondary aluminum production facility may be independent or part of a primary aluminum production facility. For purposes of this subpart, aluminum die casting facilities, aluminum foundries, and aluminum extrusion facilities are not considered to be secondary aluminum production facilities if the only materials they melt are clean charge, customer returns, or internal scrap, and if they do not operate sweat furnaces, thermal chip dryers, or scrap dryers/delacquering kilns/decoating kilns. The determination of whether a facility is a secondary aluminum production facility is only for purposes of this subpart and any regulatory requirements which are derived from the applicability of this subpart, and is separate from any determination which may be made under other environmental laws and regulations, including whether the same facility is a "secondary metal production facility" as that term is used in 42 U.S.C. § 7479(1) and 40 CFR 52.21(b)(1)(i)(A) ("prevention of significant deterioration of air quality")."*

The proposed facility will operate Group 1 furnaces and Group 2 furnaces, which qualify as secondary aluminum production processes. Group 1 furnaces are defined as a furnace of any design that melts, holds, or processes aluminum that contains paint, lubrications, coatings, or other foreign materials with or without reactive fluxing, or processes clean charge with reactive fluxing. Group 2 furnaces are defined as a furnace of any design that melts, holds, or processes only clean charge and that performs no fluxing or performs fluxing using only nonreactive, non-HAP-containing/non-HAP-generating gases or agents.

63.1505 states the emission standard and operating requirements for affected source units.

> *"The owner or operator of a new or existing affected source must comply at all times with each applicable limit in this section, including periods of startup and shutdown."*

The applicable requirements for affected sources at the proposed facility are presented in Table 8. Emission limits for Dioxins and Furans are not applicable because only clean scrap generated at the facility will be charged to the melting and holding furnaces.

TABLE 8: 40 CFR PART 63 SUBPART RRR APPLICABLE REQUIREMENTS

Description	Citation	Requirements
Group 1 holding/melting furnace emission standards	63.1505(i)(2) 63.1505(i)(4)	• 0.80 lb PM/ton of feed/charge or aluminum production weight • 0.40 lb HF/ton of feed/charge or aluminum production weight
Furnace labeling	63.1506(b)(1) 63.1506(b)(2)	• Provide and maintain easily visible labels posted at each group 1 and group 2 furnace that identifies the type of source and emission limits. • Identifies the applicable operational standard (clean scrap only, all scrap/charge, flux material(s)), control methods (work practice or control device), and operational parameter ranges as incorporated into OM&M plan.
Feed/Charge Weight	63.1506(d)(3)	• Measure and record the aluminum production weight from an affected source, provided that the aluminum production weight is measured and recorded for all emission units in the emissions group and all calculations to demonstrate compliance with the emission limits are based on aluminum production weight.
Group 1 furnace without add-on control operations	63.1506(n)(1) 63.1506(n)(2) 63.1506(n)(3)	• Maintain the total reactive chlorine flux injection rate and fluorine flux injection rate for each operating cycle or time period used in the performance test, at or below the average rate established during the performance test. • Operate each furnace in accordance with the work practice/pollution prevention measures documented in the OM&M plan and within the parameter values or ranges established in the OM&M plan. • Operate each group 1 melting/holding furnace subject to the emission standards in 63.1505(i)(2) using only clean charge as the feedstock.
Group 2 furnace	63.1506(o)(1) 63.1506(o)(2)	• Operate each furnace using only clean charge as the feedstock. • Operate each furnace using no reactive flux.
Corrective action	63.1506(p)	• When a process parameter or add-on air pollution control device operating parameter deviates from the value or range established during the performance test and incorporated in the OM&M plan, the owner or operator must initiate corrective action. Corrective action must restore operation of the affected source or emission unit (including the process or control device) to its normal or usual mode of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing

Description	Citation	Requirements
		emissions. Corrective actions taken must include follow-up actions necessary to return the process or control device parameter level(s) to the value or range of values established during the performance test and steps to prevent the likely recurrence of the cause of a deviation.
Operation, maintenance, and monitoring plan (OM&M)	63.1510(b)	• The owner or operator must prepare and implement for each new or existing affected source and emission unit, a written OM&M plan. • The owner or operator of any new affected source must submit the OM&M plan to the permitting authority for major sources, or the Administrator for area sources within 90 days after a successful initial performance test under 63.1511(b).
Feed/charge weight	63.1510(e)	• The owner or operator of an affected source or emission unit subject to an emission limit in lb/ton or gr/ton of feed/charge must install, calibrate, operate, and maintain a device to measure and record the total weight of feed/charge to, or the aluminum production from, the affected source or emission unit over the same operating cycle or time period used in the performance test.
Total reactive flux injection rate	63.1510(j)	• Install, calibrate, operate, and maintain a device to continuously measure and record the weight of gaseous or liquid reactive flux injected to each affected source or emission unit. • Calculate and record the gaseous or liquid reactive flux injection rate lb/ton for each operating cycle or time period used in the performance test using the procedure in 63.1512(o). • Record, for each 15-minute block period during each operating cycle or time period used in the performance test during which reactive fluxing occurs, the time, weight, and type of flux for each addition of flux.
Site-specific monitoring plan for Group 1 furnace without add-on controls	63.1510(o)	• The owner or operator must develop, in consultation with the permitting authority for major sources, or the Administrator for area sources, a written site-specific monitoring plan. The site-specific monitoring plan must be submitted to the permitting authority for major sources, or the Administrator for area sources as part of the OM&M plan. The site-specific monitoring plan must contain sufficient procedures to ensure continuing compliance with all applicable emission limits and must demonstrate, based on documented test results, the relationship

Description	Citation	Requirements
		between emissions of PM, HCl, and D/F (and HF for uncontrolled group 1 furnaces), and the proposed monitoring parameters for each pollutant.
Group 2 furnace	63.1510(r)	• Record a description of the materials charged to each furnace, including any nonreactive, non-HAP-containing/non-HAP-generating fluxing materials or agents. • Submit a certification of compliance with the applicable operational standard for charge materials in 63.1506(o) for each 6-month reporting period. Each certification must contain the information in 63.1516(b)(2)(v).
Secondary aluminum processing unit	63.1510(t)	• The owner or operator must calculate and record the 3-day, 24-hour rolling average emissions of PM, HCl, and D/F (and HF for uncontrolled group 1 furnaces) for each secondary aluminum processing unit on a daily basis.
Performance testing	63.1511	• Develop an approved site-specific test plan. • Perform an initial performance test within 180 days of startup in accordance with 63.1511(b), 63.1511(f), 63.1511(g), and 63.1511(h). • Following the initial test, tests must be repeated every 5 years.
Performance test requirements and procedures	63.1512	• Include data and information demonstrating compliance with the applicable emission limits for group 1 furnaces in accordance with 63.1511(e)(2), 63.1511(e)(3). • Meet the requirements of 63.1511(e)(4) for group 1 furnaces and 63.1511(h)(1), 63.1511(h)(2). • Measure the feed/charge weight or aluminum production weight for 63.1511(k).
Equations for Compliance	63.1513	• Utilize the equations in 63.1513 for demonstrating compliance with applicable emission limits.
Notifications	63.1515	• Prepare and submit an initial notification as required by 63.1515(a)(3). • Prepare and submit a compliance status notification as required by 63.1515(b).
Reports	63.1516	• Submit semiannual reports within 60 days after the end of each 6-month period and include the corrective actions, if necessary, per 63.1516(b)(1) certifications as required by 63.1516(b)(2). • Submit performance test results conducted during the reporting period per 63.1516(b)(3).

Description	Citation	Requirements
		• Submit annual compliance certifications per 63.1516(c). • Submit malfunction reports, if necessary, per 63.1516(d).
Records	63.1517	• Maintain all applicable records for at least 5 years. • Source specific records per 63.1517(b)(5), 63.1517(b)(7-9), 63.1517(b)(12-13), 63.1517(b)(17).

3.4 FEDERAL REGULATIONS – COMPLIANCE ASSURANCE MONITORING

Under 40 CFR Part 64, Compliance Assurance Monitoring (CAM) regulations, facilities are required to prepare and submit monitoring plans for certain emission units with the initial Part 70 operating permit application. Under the general applicability criteria, CAM only applies to each pollutant-specific-emission-unit (PSEU) that satisfies the following criteria pursuant to 40 CFR 64(a)(1)-(3):

- The unit is subject to an emission limitation or standard;
- The unit uses an active control device to achieve compliance with an emission limitation or standard; and
- The unit has potential pre-control device emission equal to or greater than the amount (tpy) required classifying the unit as a major source under Part 70.

Under 40 CFR 64.2(b)(1), emissions units subject to "emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to Section 111 or 112 of the Act" are exempt from the CAM regulations.

CAM will be addressed upon submittal of the Title V permit application for sources presented in this application.

ERM

APPENDIX A APPLICATION FORMS

DEQ LANDOWNER NOTIFICATION AFFIDAVIT

Tier I, II, or III permit applicants must provide notice to the landowner(s). The basis for this requirement is Title 27A of the Oklahoma Statutes, Supplement 1996, § 2-14-103(9), as described in OAC 252:4-7-13 (b).

Please note that you MUST fill out and return this affidavit even if you don't have to give any landowner notice.

A	NOTICE TO THE LANDOWNER(S) IS NOT REQUIRED because: (check one)
	My application does not involve any land.
X	My application involves only land owned by me (or applicant business).
	I have a current lease given to accomplish the permitted purpose.
	I have a current easement given to accomplish the permitted purpose.

OR

B	NOTICE TO THE LANDOWNER(S) IS REQUIRED because the land is owned by someone other than myself or the applicant business AND I HAVE NOTIFIED the following (check one):		
	Landowner(s)		Lessor or Administrator or Executor of the land
METHOD OF DELIVERY (check one):			
	Actual notice, for which I have a signed and dated receipt		
	Service by Sheriff or private process server, for which I have an affidavit		
	Service by certified mail, restricted delivery, for which I have a signed return receipt		
	Legal publication, for which I have an affidavit of publication from the newspaper, because the landowners could not be located through due diligence		

LANDOWNER AFFIDAVIT CERTIFICATION			
I, as the applicant or an authorized representative of the applicant, hereby certify that I own the real property, have a current lease or easement which is given to accomplish the permitted purpose (per Option A above), or have provided legal notice to the landowner(s) (per Option B above) about the permit application for the facility described below.			
Company Name	Oklahoma Aluminum	Facility Name	Oklahoma Aluminum - Inola
Facility Address or Legal Description.	Rogers Count parcels 66018687, 660016553, 660013052		
Responsible Official (signature)	[signature]	Date Signed	06-Feb-2026
Responsible Official (typed)	Ziad Fares	Title	Project Director Strategy & Business Intel. Finance & Corporate Development

If the landowner notice applies to your application (Option B above) you can send the following form to them as your notice:

NOTICE TO LANDOWNER OF FILING

Dear Landowner: (Name) ______________________

(Applicant name) ______________________ has filed a permit application with the Oklahoma Department of Environmental Quality for (Facility Name) ______________________ facility.

This application involves the land owned by you located at:

Address or Legal Description: ______________________

____

Signed: ______________________ Date: ______________________

AIR QUALITY DIVISION CLASSIFICATION OF AQ PERMIT APPLICATIONS & APPLICATION FEES		Application Number (AQD Use Only)	

Company Name	Oklahoma Aluminum						
Facility Name	Oklahoma Aluminum - Inola						
Mailing Address	E 620 Road	City	Inola	State	OK	Zip	74036

This form is used to document both a preliminary determination of the Tier classification and any associated Application Fee.

Step 1: APPLICATION CLASSIFICATION AND TIER DETERMINATION

DEQ's "Uniform Permitting" system, under OAC 252:004, categorizes different types of applications as Tier I, II, or III, depending on their complexity and the amount of public interest. The main effect of a Tier classification is the amount of public review given the application. For Air Quality permits, Tier I basically includes minor facilities and most synthetic minor facilities. Tier II covers major sources, and Tier III covers only very large sources such as those requiring PSD review. Additional information to make a preliminary determination of the Tier classification is provided on the next page. This determination will be verified before permit issuance.

Note that all Tier II and III applications require public notice of the application in one newspaper local to the site or facility as soon after the filing date as possible. Other public participation requirements, such as notice of draft and proposed permit, and notice of public meeting may also be required. Contact our office for more information on these requirements.

TIER CLASSIFICATION		Tier I		Tier II	✔	Tier III		N/A – AD only
FACILITY TYPE	✔	Major		Minor		Synthetic Minor	Confirmed/Corrected by: (AQD Use Only)	

Step 2: APPLICATION TYPE & FEE

Application fee may be determined according to the following schedule. The emissions level is based on the single criteria pollutant with the highest emissions rate. Fees are subject to change – please refer to OAC 252:100-7-3 or 252:100-8-1.7 for the latest fee schedule.

	MAJOR SOURCE	Fee		MINOR OR SYNTHETIC MINOR SOURCE	Fee
	Applicability Determination	$500		Applicability Determination	$500
	GP- Authorization to Construct	$900		PBR – Construct	$250
	GP- Authorization to Operate	$900		PBR – Operate	$100
✔	Part 70 Construction	$7,500		GP – Authorization to Construct	$500
	Part 70 Construction Modification	$5,000		GP – Authorization to Operate	$500
	Part 70 Operation	$7,500		Construction	$2,000
	Part 70 Minor Modification	$3,000		Permit Amendment – no emission increase	$500
	Part 70 Significant Modification	$6,000		Operating Permit	$750
	Part 70 Renewal	$7,500		Operating Permit Modification	$750
	Part 70 Relocation	$500		Relocation	$250
Application Type Confirmed – (AQD Use Only)					

GP or PBR Name (If Applicable):		Existing Permit Number (If Applicable)	

PAYMENT INFORMATION

Please choose one payment type and attach payment – payable to the Department of Environmental Quality (no cash can be accepted). Please reference the facility name (or existing permit or Authorization number) on the check or money order.

Payment Type	✔	Check		Money order	Amount/ Receipt Confirmed by: (DEQ Use Only)	
Amount:	$ 7,500	Check or Money Order Number:			Date:	

TIER DETERMINATION INFORMATION

OAC 252:004-7 categorizes different types of Air Quality applications as Tier I, II, or III, depending on their complexity and the amount of public interest under DEQ's "Uniform Permitting" system. The Tier classification affects the amount of public review given the application. Applicants may use the following as a checklist for determining Tier classification.

OAC 252:4-7-32. Air quality applications - Tier I

No Public Notice Requirement

(1) Relocation permit for a minor facility.
(2) Modification of an existing FESOP that is based on the operating conditions of a construction permit that was processed under Tier I and completed the web-based public notice requirement and does not differ from those construction permit conditions in any way considered significant. [FESOP Enhanced NSR]
(3) Extension of expiration date of a minor facility construction permit.
(4) Modification of any Part 70 source operating permit condition that is based on the operating conditions of a construction permit that was processed under Tier I (with web-based public notice), Tier II, or Tier III and OAC 252:100-8-8 and does not differ from those construction permit conditions in any way considered significant under OAC 252:100-8-7.2(b)(2). [Enhanced NSR]
(5) Extension of expiration date of a Part 70 source's construction permit.
(6) New, modified, and renewed individual authorizations under general permits for which a schedule of compliance is not required by OAC 252:100-8-5(e)(8)(B)(i).
(7) Burn approvals.
(8) Administrative amendments of all air quality permits and other authorizations.

No Public Notice Requirement, 45-Day EPA Review Requirement

(1) Minor modification to a Part 70 source operating permit where the facility obtained a prior construction permit for the modification as required by OAC 252:100-8-4(a)(1)(B)(iv). [Traditional NSR]
(2) Minor modification under OAC 252:100-8-7.2(b)(1) to a Part 70 source operating permit that did not trigger an NSR permitting action.

Web-based Public Notice Requirement

(1) New minor NSR construction permit for a minor facility.
(2) Initial operating permit for a new minor facility.
(3) Modification of a construction permit for a minor facility.
(4) Modification of an existing minor operating permit that was issued prior to September 15, 2021, and that will now become a FESOP.
(5) Modification of a minor operating permit that did not undergo the *FESOP Enhanced NSR Process*. [Traditional NSR]
(6) Construction permit for an existing Part 70 source as required by OAC 252:100-8-4(a)(1)(B)(iv).

OAC 252:4-7-33. Air quality applications - Tier II

(1) A minor facility seeking a permit for a facility modification that when completed would turn it into a Part 70 source.
(2) Any permit application for a Part 70 source that would result, on issuance, with the facility being covered by a FESOP (PBR, GP, or individual facility operating permit).
(3) Construction permit for a new Part 70 source not classified under Tier III.
(4) Construction permit for an existing Part 70 source for any facility change considered significant under OAC 252:100-8-7.2(b)(2) and which is not classified under Tier III.
(5) Initial operating permit for a Part 70 source.
(6) Acid rain permit that is independent of a Part 70 permit application.
(7) Temporary source permit under OAC 252:100-8-6.2.
(8) Significant modification, as described in OAC 252:100-8-7.2(b)(2), of a Part 70 operating permit or a modification of a Part 70 operating permit incorporating a Tier II construction permit that did not undergo the *Enhanced NSR Process*.
(9) Modification of a Part 70 operating permit when the conditions proposed for modification differ from the underlying construction permit's operating conditions in any way considered significant under OAC 252:100-8-7.2(b)(2).
(10) A construction permit modification considered significant under OAC 252:100-8-7.2(b)(2) and which is not classified under Tier III.
(11) Renewals of operating permits for Part 70 sources.
(12) New, modified, and renewed general permits.
(13) Individual authorizations under any general permit for which a schedule of compliance is required by OAC 252:100-8-5(e)(8)(B)(i).
(14) Plant-wide emission plan approval under OAC 252:100-37-25(b) or OAC 252:100-39-46(j).

OAC 252:4-7-34. Air quality applications - Tier III

(a) A construction permit for any new major stationary source listed in this subsection requires a Tier III application. For purposes of this section, "Major stationary source" means:

✓ (1) Any of the following sources of air pollutants which emits, or has the PTE, 100 TPY or more of any pollutant subject to regulation:

(A) carbon black plants (furnace process),
(B) charcoal production plants,
(C) chemical process plants,
(D) coal cleaning plants (with thermal dryers),
(E) coke oven batteries,
(F) fossil-fuel boilers (or combustion thereof), totaling more than 250 million BTU per hour heat input,
(G) fossil fuel-fired steam electric plants of more than 250 million BTU per hour heat input,
(H) fuel conversion plants,
(I) glass fiber processing plants,
(J) hydrofluoric, sulfuric or nitric acid plants,
(K) iron and steel mill plants,
(L) kraft pulp mills,
(M) lime plants,
(N) incinerators, except where used exclusively as air pollution control devices,
(O) petroleum refineries,
(P) petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels,
(Q) phosphate rock processing plant,
(R) portland cement plants,
✓ (S) primary aluminum ore reduction plants,
(T) primary copper smelters,
(U) primary lead smelters,
(V) primary zinc smelters,
(W) secondary metal production plants,
(X) sintering plants,
(Y) sulfur recovery plants, or
(Z) taconite ore processing plants, and

(2) Any other source not specified in paragraph (1) of this definition which emits, or has the PTE, 250 TPY or more of any pollutant subject to regulation.

(b) Existing incinerators. An application for any change in emissions or potential to emit, or any change in any permit condition, that would have caused an incinerator to be defined as a major stationary source when originally permitted shall require a Tier III application.

AIR QUALITY PERMIT APPLICATION GENERAL FACILITY INFORMATION		APPLICATION NUMBER (AQD Use Only)	

1	COMPANY INFORMATION	Name	Oklahoma Aluminum				
Mailing Address	E 620 Road	City	Inola	State	OK	Zip	74036

2	APPLICATION TYPE	Applicability Determination	✔	Construction Permit		Operating Permit
	GP Authorization To Construct	GP Authorization To Operate		GP Name:		
	Renewal	Modification	Relocation	PBR	PBR Type:	
Permit Number(s) (If Applicable)	N/A					
Est. Date of Construction/Modification Start:	1/1/2027	Operational Start-up:	1/1/2030			
Construction Permit Public Review Process:	✔	Traditional		Enhanced		

3	IS CONFIDENTIAL INFORMATION INCLUDED?	YES	✔	NO

By including confidential information, Applicant acknowledges that such information may be shared with the U.S. Environmental Protection Agency for purposes consistent with the Federal Clean Air Act, 42 U.S.C. §§ 4201 et. seq.

4	TIER CLASSIFICATION		Tier I	Tier II	✔	Tier III	N/A – AD only
FACILITY TYPE		✔	Major	Minor		Synthetic Minor	

5	FEES SUBMITTED	$7500	Check #		Date	

6	TECHNICAL CONTACT	Name	Ziad Fares				
Phone	+9 712 308 1534	Email Address	zfares@ega.ae				
Company Name	Oklahoma Aluminum						
Street Address	E 620 Road	City	Inola	State	OK	Zip	74036

7	FACILITY INFORMATION	Name	Oklahoma Aluminum				
SIC Code(s)	3334			NAICS Code(s)	331313		
Contact Person	Ziad Fares	Title	Project Director Strategy & Business Intel, Finance & Corpo	Phone	+9 712 308 1534		
LEGAL DESCRIPTION	Sub Section		Section		Township		Range
Physical Address or Driving Directions	Tulsa Port of Inola, E 620 Road						
City or Nearest Town	Inola	Zip	74036	County	Rogers		

8	GEOGRAPHIC COORDINATES	Latitude (to 5 Decimals)	36.12278	Longitude (to 5 Decimals)	-95.55526
REFERENCE POINT		Facility Entrance Point or First Gate of Lease Property (preferred above all other options)			
✔	Center of Facility	Other (Specify):			

9	APPLICATION CERTIFICATION	This application, including all attachments, has been submitted as required by OAC 252:100.

I certify that (a) I am the Responsible Official for this company as defined in OAC 252:100-1-3; and (b) based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete.

Responsible Official (name)	Ziad Fares		Title	Project Director Strategy & Business Intel, Finance & Corporate Development			
Responsible Official (signature)	[signature]		Date	06-Feb-2026			
Phone	+9 712 308 1534	Email Address	zfares@ega.ae				
Street Address	E 620 Road	City	Inola	State	OK	Zip	74036

Part 3 **DEQ**

Emissions Unit Group (EUG) Description

1 **Company Name** Oklahoma Aluminum
Facility Name Oklahoma Aluminum - Inola

2 **EUG** EU_01 Potline **3** **Scenario** Normal

4 **Emission Unit (EU) Information**

(a) EU ID	(b) Point ID	(c) EU Name/Model	(d) Construction/ Modification Date
322-1	322-1	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	TBD
322-2	322-2	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	TBD
321-1	321-1	Cell operation room A1	TBD
321-2	321-2	Cell operation room A2	TBD
321-3	321-3	Cell operation room B1	TBD
321-4	321-4	Cell operation room B2	TBD
324-1	324-1	Fluorinated alumina handling & storage#1	TBD
324-2	324-2	Fluorinated alumina handling & storage#2	TBD
325-1	325-1	Crushed bath handling & storage#1	TBD
325-2	325-2	Crushed bath handling & storage#2	TBD
326-1	326-1	Anode cover material transportation PTM station room A1-1	TBD
326-2	326-2	Anode cover material transportation PTM station room A1-2	TBD
326-3	326-3	Anode cover material transportation PTM station room A2-1	TBD
326-4	326-4	Anode cover material transportation PTM station room A2-2	TBD
326-5	326-5	Anode cover material transportation PTM station room B1-1	TBD
326-6	326-6	Anode cover material transportation PTM station room B1-2	TBD
326-7	326-7	Anode cover material transportation PTM station room B2-1	TBD
326-8	326-8	Anode cover material transportation PTM station room B2-2	TBD
328-1	328-1	Fresh alumina handling & storage#1	TBD
328-2	328-2	Fresh alumina handling & storage#2	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application TSD.

Part 3 **DEQ**

Emissions Unit Group (EUG) Description

1 **Company Name** Oklahoma Aluminum
Facility Name Oklahoma Aluminum - Inola

2 **EUG** EU_02 Potline Services **3** **Scenario** Normal

4 **Emission Unit (EU) Information**

(a) EU ID	(b) Point ID	(c) EU Name/Model	(d) Construction/ Modification Date
341-1	341-1	Cast iron melting Induction furnace operation	TBD
342-1	342-1	Potshell repair blasting operation	TBD
342-2	342-2	Pot delining operation	TBD
344-1	344-1	Crucible repair station operation	TBD
344-2	344-2	Crucible cleaning machine operation	TBD
344-3	344-3	Tube cleaning machine operation	TBD
344-4	344-4	Crucible lid cleaning operation	TBD
344-5	344-5	Metal Crucible Preheating Station	TBD
344-6	344-6	Bath Crucible Preheating Station	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application TSD.

Part 3 **DEQ**
Emissions Unit Group (EUG) Description

1 **Company Name** Oklahoma Aluminum
Facility Name Oklahoma Aluminum - Inola

2 **EUG** EU_03 Casthouse **3** **Scenario** Normal

4 **Emission Unit (EU) Information**

(a) EU ID	(b) Point ID	(c) EU Name/Model	(d) Construction/ Modification Date
420-1	420-1	Casthouse billet casting furnace operation (6 stacks)	TBD
420-2	420-2	Casthouse PFA casting furnace operation (2 stacks)	TBD
420-3	420-3	Casthouse rod casting furnace operation (2 stacks)	TBD
420-4	420-4	Casthouse sheet casting furnace operation (3 stacks)	TBD
460-1	460-1	Sodium Reduction Station#1 (2 bays) operation	TBD
460-2	460-2	Sodium Reduction Station#2 (2 bays) operation	TBD
470-1	470-1	Casthouse dross press#1 operation	TBD
470-2	470-2	Casthouse dross press#2 operation	TBD
470-3	470-3	Casthouse dross press#3 operation	TBD
430-1	430-1	Mold Preheaters	TBD
430-2	430-2	Mold Coating Systems	TBD
430-4	430-4	Ingot Marking	TBD
430-5	430-5	Billet Stamping	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application TSD.

Part 3 **DEQ**

Emissions Unit Group (EUG) Description

1 **Company Name** Oklahoma Aluminum
Facility Name Oklahoma Aluminum - Inola

2 **EUG** EU_04 Carbon Area **3** **Scenario** Normal

4 **Emission Unit (EU) Information**

(a) EU ID	(b) Point ID	(c) EU Name/Model	(d) Construction/ Modification Date
210-1	210-1	Paste Plant Coke handling and storage operation	TBD
210-2	210-2	Paste Plant dry matter crushing & screening operation	TBD
210-3	210-3	Paste Plant proportioning and pre-heating operation	TBD
210-4	210-4	Paste Plant#1 vertical mill	TBD
210-5	210-5	Paste Plant#2 vertical mill	TBD
210-6	210-6	Paste plant#1 CTP storage, paste mixing & forming operation	TBD
210-7	210-7	Paste plant#2 CTP storage, paste mixing & forming operation	TBD
210-8	210-8	Paste plant HTM gas boiler operation	TBD
211-6	211-6	Paste Plant Preheater #1	TBD
211-7	211-7	Paste Plant Preheater #2	TBD
220-1	220-1	Anode cleaning & slot cutting#1 operation	TBD
220-2	220-2	Anode cleaning & slot cutting#2 operation	TBD
230-1	230-1	Baking fires and FTC operation ABF#1	TBD
230-2	230-2	Baking fires and FTC operation ABF#2	TBD
240-1	240-1	Butt cleaning operation	TBD
240-2	240-2	Butt pre-cleaning operation	TBD
240-3	240-3	Butt shot blasting operation	TBD
240-4	240-4	Butt & thimble press operation	TBD
240-5	240-5	Butt transfer car operation	TBD
240-6	240-6	Cast iron recycling operation	TBD
240-7	240-7	Cast iron melting Induction furnace operation	TBD
240-8	240-8	Stem brushing operation	TBD
240-9	240-9	Stub shot blasting operation	TBD
241-10	241-10	Stub Hole Pre-Heating Station	TBD
250-1	250-1	Bath handling & storage	TBD
250-2	250-2	Bath processing facility operation	TBD
250-3	250-3	Cavity bath handling	TBD
250-4	250-4	Pure Bath Silo	TBD
260-1	260-1	Butts crushing operation	TBD
260-2	260-2	Carbon recycled material storage	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application TSD.

Part 3 **DEQ**

Emissions Unit Group (EUG) Description

1	**Company Name**	Oklahoma Aluminum	
	Facility Name	Oklahoma Aluminum - Inola	

2	**EUG**	EU_05 Mat. Hand. and Storage	**3**	**Scenario**	Normal

4 **Emission Unit (EU) Information**

(a) EU ID	**(b) Point ID**	**(c) EU Name/Model**	**(d) Construction / Modification Date**
810-1	810-1	Alumina storage#1	TBD
810-2	810-2	Alumina storage#2	TBD
820-1	820-1	AlF3 handling and storage	TBD
830-1	830-1	CPC storage#1	TBD
830-2	830-2	CPC storage#2	TBD
830-3	830-3	Coke Buffer Silo	TBD
900-1	900-1	Vacuum barge unloader operation	TBD
900-2	900-2	Vacuum barge unloader operation	TBD
900-3	900-3	Raw material handling operation	TBD
900-4	900-4	Raw material handling operation	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application TSD.

Part 3 **DEQ**

Emissions Unit Group (EUG) Description

1	**Company Name**	Oklahoma Aluminum
	Facility Name	Oklahoma Aluminum - Inola

2 **EUG** EU_06 Paved Roadways **3** **Scenario** Normal

4 **Emission Unit (EU) Information**

(a) EU ID	(b) Point ID	(c) EU Name/Model	(d) Construction/ Modification Date
120	120	Paved Roads	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application TSD.

Part 3 **DEQ**

Emissions Unit Group (EUG) Description

1 **Company Name** Oklahoma Aluminum
Facility Name Oklahoma Aluminum - Inola

2 **EUG** EU_07 Emergency Powe **3** **Scenario** Normal

4 **Emission Unit (EU) Information**

(a) EU ID	(b) Point ID	(c) EU Name/Model	(d) Construction/ Modification Date
315-1	315-1	Compressor Substation Diesel Generator	TBD
315-2	315-2	Small Size Diesel Generators	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application

Part 3 **DEQ**

Emissions Unit Group (EUG) Description

1	**Company Name**	Oklahoma Aluminum
	Facility Name	Oklahoma Aluminum - Inola

2	**EUG**	EU_08 Water-Cooling Systems	**3**	**Scenario**	Normal

4 **Emission Unit (EU) Information**

(a) EU ID	(b) Point ID	(c) EU Name/Model	Construction / Modification Date
450	450	Casthouse Cooling Water and Treatment Towers	TBD
213	213	Green Anode Cooling Tower(s)	TBD
430-3	430-3	Mold Water Cooling Systems	TBD
241-13	241-13	Carbon area cooling tower system for induction furnace	TBD

5 Include a Process Flow or Block Diagram as Appendix D and
A Narrative Description of the Facility as Appendix - not an appendix - application TSD.

ERM

APPENDIX B EMISSION CALCULATIONS

Emissions Scenario	CO		NOx		PM		PM10		PM2.5		SO2	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Uncontrolled Emissions	19,920.29	87,182.37	100.86	316.20	11,555.02	50,607.06	8,356.10	36,519.45	2,902.33	12,707.71	3,112.15	13,606.82
Emissions Based on Regulatory, BACT, or Modeling w/ FGD	19,920.29	87,182.37	100.86	316.20	167.82	731.12	107.08	453.67	61.51	265.52	352.62	1,520.08

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2	
Source ID	**Description**	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EU_01 Potline	Potrooms A & B Emissions, GTCs 1 & 2, and material handling and storage	19,756.4	86,533.0	9.1	39.9	10,920.7	47,832.8	7,985.1	34,974.6	2,692.9	11,795.0	2,938.0	12,868.4
EU_02 Potline Services	Potline Services	0.0	0.0	0.0	0.0	17.5	76.8	7.2	31.6	2.5	10.9	0.0	0.0
EU_03 Casthouse	Casting Operations	3.5	15.2	3.8	16.5	5.5	24.0	5.3	23.3	3.6	15.6	0.3	1.2
EU_04 Carbon Area	Carbon Area Sources	143.9	630.1	57.6	252.2	376.3	1,648.2	287.1	1,257.6	195.4	856.0	168.0	735.8
EU_05 Mat. Hand. and Storage	Raw material or byproduct handling operations	0.0	0.0	0.0	0.0	10.3	45.1	7.6	33.2	2.5	11.0	0.0	0.0
EU_06 Paved Roadways	Transport of goods and materials by vehicles	0.0	0.0	0.0	0.0	153.7	673.1	30.2	132.3	4.3	18.9	0.0	0.0
EU_07 Emergency Power	Emergency Generators	16.6	4.1	30.4	7.6	0.9	0.2	0.9	0.2	0.9	0.2	5.9	1.5
EU_08 Water-Cooling Systems	dissipation	0.0	0.0	0.0	0.0	70.1	306.8	32.7	66.7	0.1	0.0	0.0	0.0
Total		19,920.3	87,182.4	100.9	316.2	11,555.0	50,607.1	8,356.1	36,519.4	2,902.3	12,707.7	3,112.2	13,606.8

Emissions Based on Regulatory, BACT, or Modeling w/ FGD		CO		NOx		PM		PM10		PM2.5		SO2	
Source ID	**Description**	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EU_01 Potline	Potrooms A & B Emissions, GTCs 1 & 2, and material handling and storage	19,756.4	86,533.0	9.1	39.9	111.0	486.0	67.0	293.4	40.5	177.5	178.5	781.6
EU_02 Potline Services	Potline Services	0.01	0.02	0.00	0.02	6.1	26.5	6.1	26.5	3.4	14.9	0.0	0.0
EU_03 Casthouse	Casting Operations	3.5	15.2	3.8	16.5	4.3	18.8	7.8	22.9	3.6	15.6	0.3	1.2
EU_04 Carbon Area	Carbon Area Sources	143.9	630.1	57.6	252.2	19.6	85.8	18.2	79.6	10.9	47.5	168.0	735.8
EU_05 Mat. Hand. and Storage	Raw material or byproduct handling operations	0.0	0.0	0.0	0.0	2.2	9.7	2.2	9.7	1.1	4.9	0.0	0.0
EU_06 Paved Roadways	Transport of goods and materials by vehicles	0.0	0.0	0.0	0.0	23.1	101.0	4.5	19.8	1.1	4.9	0.0	0.0
EU_07 Emergency Power	Emergency Generators	16.6	4.1	30.4	7.6	0.9	0.2	0.9	0.2	0.9	0.2	5.9	1.5
EU_08 Water-Cooling Systems	dissipation	0.0	0.0	0.0	0.0	0.7	3.1	0.3	1.4	0.0	0.0	0.0	0.0
Total		19,920.3	87,182.4	100.9	316.2	167.8	731.1	107.1	453.7	61.5	265.5	352.6	1,520.1

VOC		CO2		CO2e	Total Fluorides		Fluoride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
183.89	448.77	365,028.75	1,593,885.68	6,938,730.38	6,889.15	30,174.50	2,067.78	9,056.87	34.59	151.49	0.15	0.68	4,778.54	20,911.94
131.11	217.58	365,028.75	1,593,885.68	6,938,730.38	97.13	425.46	38.46	168.45	3.27	14.34	0.15	0.68	63.04	258.06

VOC		CO2		CO2e	Total Fluorides		Fluoride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
41.7	182.6	363,347.5	1,591,462.0	6,936,293.9	6,810.5	29,829.9	2,067.8	9,056.9	0.4	1.9	0.0	0.0	4,742.7	20,773.1
0.0	0.0	7.0	30.6	30.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.9	247.8	1,085.3	1,091.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	4.3	0.9
58.8	257.6	230.3	1,008.8	1,014.4	78.7	344.6	0.0	0.0	34.1	149.6	0.0	0.0	31.5	137.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30.4	7.6	1,196.2	299.0	300.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
183.9	448.8	365,028.7	1,593,885.7	6,938,730.4	6,889.2	30,174.5	2,067.8	9,056.9	34.6	151.5	0.2	0.7	4,778.5	20,911.9

VOC		CO2		CO2e	Total Fluorides		Fluoride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
41.7	182.6	363,347.5	1,591,462.0	6,936,293.9	96.1	420.9	37.8	165.8	0.4	1.9	0.0	0.0	58.2	255.1
0.0	0.0	7.0	30.6	30.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.8	13.3	247.8	1,085.3	1,091.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	4.3	0.9
3.2	14.0	230.3	1,008.8	1,014.4	1.0	4.6	0.6	2.7	2.8	12.4	0.0	0.0	0.4	1.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30.4	7.6	1,196.2	299.0	300.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
131.1	217.6	365,028.7	1,593,885.7	6,938,730.4	97.1	425.5	38.5	168.4	3.3	14.3	0.2	0.7	63.0	258.1

EU_01 Potline
Potrooms A & B Emissions, GTCs 1 & 2, and material handling and storage

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
322-1	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	9,766.50	42,777.26	4.50	19.70	5,410.26	23,696.94	3,963.56	17,360.38	1,330.94	5,829.53	1,452.38	6,361.44	19.94	87.35
322-2	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	9,766.50	42,777.26	4.50	19.70	5,410.26	23,696.94	3,963.56	17,360.38	1,330.94	5,829.53	1,452.38	6,361.44	19.94	87.35
321-1	Cell operation room A1	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
321-2	Cell operation room A2	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
321-3	Cell operation room B1	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
321-4	Cell operation room B2	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
324-1	Fluorinated alumina handling & storage#1	0.00	0.00	0.00	0.00	0.55	2.41	0.47	2.05	0.17	0.72	0.00	0.00	0.00	0.00
324-2	Fluorinated alumina handling & storage#2	0.00	0.00	0.00	0.00	0.55	2.41	0.47	2.05	0.17	0.72	0.00	0.00	0.00	0.00
325-1	Crushed bath handling & storage#1	0.00	0.00	0.00	0.00	0.55	2.41	0.19	0.84	0.03	0.13	0.00	0.00	0.00	0.00
325-2	Crushed bath handling & storage#2	0.00	0.00	0.00	0.00	0.55	2.41	0.19	0.84	0.03	0.13	0.00	0.00	0.00	0.00
326-1	PTM station room A1-1	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
326-2	Anode cover material transportation PTM station room A1-2	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
326-3	Anode cover material transportation	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
326-4	PTM station room A2-2	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
326-5	PTM station room B1-1	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
326-6	PTM station room B1-2	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
326-7	PTM station room B2-1	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
326-8	Anode cover material transportation	0.00	0.00	0.00	0.00	0.28	1.21	0.10	0.42	0.01	0.06	0.00	0.00	0.00	0.00
328-1	Fresh alumina handling & storage#1	0.00	0.00	0.00	0.00	0.55	2.41	0.47	2.05	0.17	0.72	0.00	0.00	0.00	0.00
328-2	Fresh alumina handling & storage#2	0.00	0.00	0.00	0.00	0.55	2.41	0.47	2.05	0.17	0.72	0.00	0.00	0.00	0.00
	Total	19,756.38	86,532.96	9.10	39.86	10,920.73	47,832.76	7,985.06	34,974.58	2,692.92	11,795.00	2,937.99	12,868.38	41.68	182.56

CO2		CO2e	Total Flourides		Flourine PM		PAH		HCl		HAPs	
lb/hr	**tpy**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
181,673.74	795,730.98	3,468,146.96	3,381.81	14,812.31	1,022.41	4,478.14	0.22	0.96	0.00	0.00	2,359.40	10,334.17
181,673.74	795,730.98	3,468,146.96	3,381.81	14,812.31	1,022.41	4,478.14	0.22	0.96	0.00	0.00	2,359.40	10,334.17
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
363,347.48	1,591,461.96	6,936,293.92	6,810.48	29,829.92	2,067.78	9,056.87	0.44	1.93	0.00	0.00	4,742.71	20,773.06

Potential Controlled + Allowable Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
322-1	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	9,766.50	42,777.26	4.50	19.70	7.87	34.45	5.76	25.23	5.03	22.03	72.62	318.07	19.94	87.35
322-2	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	9,766.50	42,777.26	4.50	19.70	7.87	34.45	5.76	25.23	5.03	22.03	72.62	318.07	19.94	87.35
321-1	Cell operation room A1	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
321-2	Cell operation room A2	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
321-3	Cell operation room B1	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
321-4	Cell operation room B2	55.85	244.61	0.03	0.11	23.67	103.69	13.73	60.14	7.55	33.07	8.31	36.38	0.45	1.96
324-1	Fluorinated alumina handling & storage#1	0.00	0.00	0.00	0.00	0.05	0.24	0.05	0.24	0.03	0.12	0.00	0.00	0.00	0.00
324-2	Fluorinated alumina handling & storage#2	0.00	0.00	0.00	0.00	0.05	0.24	0.05	0.24	0.03	0.12	0.00	0.00	0.00	0.00
325-1	Crushed bath handling & storage#1	0.00	0.00	0.00	0.00	0.05	0.24	0.05	0.24	0.03	0.12	0.00	0.00	0.00	0.00
325-2	Crushed bath handling & storage#2	0.00	0.00	0.00	0.00	0.05	0.24	0.05	0.24	0.03	0.12	0.00	0.00	0.00	0.00
326-1	Anode cover material transportation PTM station room A1-1	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
326-2	Anode cover material transportation PTM station room A1-2	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
326-3	Anode cover material transportation PTM station room A2-1	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
326-4	Anode cover material transportation PTM station room A2-2	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
326-5	Anode cover material transportation PTM station room B1-1	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
326-6	Anode cover material transportation PTM station room B1-2	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
326-7	Anode cover material transportation PTM station room B2-1	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
326-8	Anode cover material transportation PTM station room B2-2	0.00	0.00	0.00	0.00	0.03	0.12	0.03	0.12	0.01	0.06	0.00	0.00	0.00	0.00
328-1	Fresh alumina handling & storage#1	0.00	0.00	0.00	0.00	0.05	0.24	0.05	0.24	0.03	0.12	0.00	0.00	0.00	0.00
328-2	Fresh alumina handling & storage#2	0.00	0.00	0.00	0.00	0.05	0.24	0.05	0.24	0.03	0.12	0.00	0.00	0.00	0.00
	Total	**19,756.38**	**86,532.96**	**9.10**	**39.86**	**110.96**	**486.01**	**66.98**	**293.39**	**40.53**	**177.52**	**178.46**	**781.65**	**41.68**	**182.56**

CO2		CO2e	Total Flourides		Flourine PM		PAH		HCl		HAPs	
lb/hr	tpy	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
181,673.74	795,730.98	3,468,146.96	24.61	107.79	7.44	32.59	0.22	0.96	0.00	0.00	17.17	75.20
181,673.74	795,730.98	3,468,146.96	24.61	107.79	7.44	32.59	0.22	0.96	0.00	0.00	17.17	75.20
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	11.72	51.33	5.74	25.15	0.00	0.00	0.00	0.00	5.98	26.18
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
363,347.48	**1,591,461.96**	**6,936,293.92**	**96.09**	**420.88**	**37.84**	**165.76**	**0.44**	**1.93**	**0.00**	**0.00**	**58.25**	**255.12**

321-1
Cell operation room A1

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Non Treated Emission Factor (tn.pollutant/year)	Release Point Type (stack, monovent, volume, area)	Emission Rate [1] (tn.pollutant/year)	Safety Factor [5]	Emission Rate w/ Safety Factor [2] (tn.pollutant/year)	Hourly ER w/ Safety Factor [3] (lb/hr)	lb/ton
321-1	Cell operation room A1	206,683.4	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM	tn.TPM/year	82.9	low profile roof vent room A1	82.949	25.00%	103.7	23.7	1.003
	Cell operation room A1	206,683.4	tn.Al/year	SO2	tn.SO2/year	36.4	low profile roof vent room A1	36.376	0.00%	36.4	8.3	0.352
	Cell operation room A1	206,683.4	tn.Al/year	AlF3, Na3AlF6 PM	tn.F/year	20.1	low profile roof vent room A1	20.117	25.00%	25.1	5.7	0.243
	Cell operation room A1	206,683.4	tn.Al/year	HF	tn.F/year	20.9	low profile roof vent room A1	20.944	25.00%	26.2	6.0	0.253
	Cell operation room A1	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM2.5 [6]	tn.PM2.5/year	26.5	low profile roof vent room A1	26.455	25.00%	33.1	7.6	0.320
	Cell operation room A1	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM10 **[4]**	tn.PM10/year	48.1	low profile roof vent room A1	48.110	25.00%	60.1	13.7	0.582
	Cell operation room A1	206,683.4	tn.Al/year	CO	tn.CO/year	195.7	low profile roof vent room A1	195.689	25.00%	244.6	55.8	2.367
	Cell operation room A1	206,683.4	tn.Al/year	NOx	tn.NOx/year	0.1	low profile roof vent room A1	0.090	25.00%	0.1	0.0	0.0011
	Cell operation room A1	206,683.4	tn.Al/year	VOC [7]	tn.VOC/year	1.6	low profile roof vent room A1	1.6	25.00%	1.96	0.45	0.0190

Notes:
[1] Emission rate (tn.pollutant/yr) = Non Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))
[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)
[4] Emission "factor" multiplied by 58% to convert to PM10 from TPM. Value of 58% from Table 12.1-2 AP-42 Chapter 12 "Primary Aluminum Production"
[5] Safety factor is a value used to adjust EGA provided data to adjust for differences in the operating environment.
[6] PM2.5 is value factored from TPM using industry ratio. (Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and
[7] VOC emissions calculated using 0.166 lb/hr from the CWPB1 Potline 5 - Century Aluminum of KY facility, scaled up to the number of pots at EGA-Inola

321-2
Cell operation room A2

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Non Treated Emission Factor (tn.pollutant/year)	Release Point Type (stack, monovent, volume, area)	Emission Rate [1] (tn.pollutant/year)	Safety Factor [5]	Emission Rate w/ Safety Factor [2] (tn.pollutant/ year)	Hourly ER w/ Safety Factor [3] (lb/hr)	lb/ton
321-2	Cell operation room A2	206,683.4	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM	tn.TPM/year	82.9	low profile roof vent room A2	82.949	25.00%	103.7	23.7	1.003
	Cell operation room A2	206,683.4	tn.Al/year	SO2	tn.SO2/year	36.4	low profile roof vent room A2	36.376	0.00%	36.4	8.3	0.352
	Cell operation room A2	206,683.4	tn.Al/year	AlF3, Na3AlF6 PM	tn.F/year	20.1	low profile roof vent room A2	20.117	25.00%	25.1	5.7	0.243
	Cell operation room A2	206,683.4	tn.Al/year	HF	tn.F/year	20.9	low profile roof vent room A2	20.944	25.00%	26.2	6.0	0.253
	Cell operation room A2	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM2.5 [6]	tn.PM2.5/year	26.5	low profile roof vent room A2	26.455	25.00%	33.1	7.6	0.320
	Cell operation room A2	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM10 **[4]**	tn.PM10/year	48.1	low profile roof vent room A2	48.110	25.00%	60.1	13.7	0.582
	Cell operation room A2	206,683.4	tn.Al/year	CO	tn.CO/year	195.7	low profile roof vent room A2	195.689	25.00%	244.6	55.8	2.367
	Cell operation room A2	206,683.4	tn.Al/year	NOx	tn.NOx/year	0.1	low profile roof vent room A2	0.090	25.00%	0.1	0.0	0.0011
	Cell operation room A3	206,683.4	tn.Al/year	VOC	tn.VOC/year	1.6	low profile roof vent room A2	1.6	25.00%	1.96	0.45	0.0190

Notes:
[1] Emission rate (tn.pollutant/yr) = Non Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))
[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)
[4] Emission "factor" multiplied by 58% to convert to PM10 from TPM. Value of 58% from Table 12.1-2 AP-42 Chapter 12 "Primary Aluminum Production"
[5] Safety factor is a value used to adjust EGA provided data to adjust for differences in the operating environment.
[6] PM2.5 is value factored from TPM using industry ratio. (Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and
[7] VOC emissions calculated using 0.166 lb/hr from the CWPB1 Potline 5 - Century Aluminum of KY facility, scaled up to the number of pots at EGA-Inola

321-3
Cell operation room B1

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Non Treated Emission Factor (tn.pollutant /year)	Release Point Type (stack, monovent, volume, area)	Emission Rate [1] (tn.pollutant /year)	Safety Factor [5]	Emission Rate w/ Safety Factor [2] (tn.pollutant/ year)	Hourly ER w/ Safety Factor [3] (lb/hr)	lb/ton
321-3	Cell operation room B1	206,683.4	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM	tn.TPM/year	82.9	low profile roof vent room B1	82.949	25.00%	103.7	23.7	1.003
	Cell operation room B1	206,683.4	tn.Al/year	SO2	tn.SO2/year	36.4	low profile roof vent room B1	36.376	0.00%	36.4	8.3	0.352
	Cell operation room B1	206,683.4	tn.Al/year	AlF3, Na3AlF6 PM	tn.F/year	20.1	low profile roof vent room B1	20.117	25.00%	25.1	5.7	0.243
	Cell operation room B1	206,683.4	tn.Al/year	HF	tn.F/year	20.9	low profile roof vent room B1	20.944	25.00%	26.2	6.0	0.253
	Cell operation room B1	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM2.5 [6]	tn.PM2.5/year	26.5	low profile roof vent room B1	26.455	25.00%	33.1	7.6	0.320
	Cell operation room B1	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM10 **[4]**	tn.PM10/year	48.1	low profile roof vent room B1	48.110	25.00%	60.1	13.7	0.582
	Cell operation room B1	206,683.4	tn.Al/year	CO	tn.CO/year	195.7	low profile roof vent room B1	195.689	25.00%	244.6	55.8	2.367
	Cell operation room B1	206,683.4	tn.Al/year	NOx	tn.NOx/year	0.1	low profile roof vent room B1	0.090	25.00%	0.1	0.0	0.0011
	Cell operation room B2	206,683.4	tn.Al/year	VOC	tn.VOC/year	1.6	low profile roof vent room B1	1.6	25.00%	1.96	0.45	0.0190

Notes:

[1] Emission rate (tn.pollutant/yr) = Non Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons

[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))

[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)

[4] Emission "factor" multiplied by 58% to convert to PM10 from TPM. Value of 58% from Table 12.1-2 AP-42 Chapter 12 "Primary Aluminum Production"

[5] Safety factor is a value used to adjust EGA provided data to adjust for differences in the operating environment.

[6] PM2.5 is value factored from TPM using industry ratio. (Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and

[7] VOC emissions calculated using 0.166 lb/hr from the CWPB1 Potline 5 - Century Aluminum of KY facility, scaled up to the number of pots at EGA-Inola

321-4
Cell operation room B2

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Non Treated Emission Factor (tn.pollutant /year)	Release Point Type (stack, monovent, volume, area)	Emission Rate [1] (tn.pollutant /year)	Safety Factor [5]	Emission Rate w/ Safety Factor [2] (tn.pollutant/ year)	Hourly ER w/ Safety Factor [3] (lb/hr)	lb/ton
321-4	Cell operation room B2	206,683.4	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM	tn.TPM/year	82.9	low profile roof vent room B2	82.949	25.00%	103.7	23.7	1.003
	Cell operation room B2	206,683.4	tn.Al/year	SO2	tn.SO2/year	36.4	low profile roof vent room B2	36.376	0.00%	36.4	8.3	0.352
	Cell operation room B2	206,683.4	tn.Al/year	AlF3, Na3AlF6 PM	tn.F/year	20.1	low profile roof vent room B2	20.117	25.00%	25.1	5.7	0.243
	Cell operation room B2	206,683.4	tn.Al/year	HF	tn.F/year	20.9	low profile roof vent room B2	20.944	25.00%	26.2	6.0	0.253
	Cell operation room B2	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM2.5 [6]	tn.PM2.5/year	26.5	low profile roof vent room B2	26.455	25.00%	33.1	7.6	0.320
	Cell operation room B2	206,683.4	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM10 **[4]**	tn.PM10/year	48.1	low profile roof vent room B2	48.110	25.00%	60.1	13.7	0.582
	Cell operation room B2	206,683.4	tn.Al/year	CO	tn.CO/year	195.7	low profile roof vent room B2	195.689	25.00%	244.6	55.8	2.367
	Cell operation room B2	206,683.4	tn.Al/year	NOx	tn.NOx/year	0.1	low profile roof vent room B2	0.090	25.00%	0.1	0.0	0.0011
	Cell operation room B3	206,683.4	tn.Al/year	VOC	tn.VOC/year	1.6	low profile roof vent room B2	1.6	25.00%	1.96	0.45	0.0190

Notes:

[1] Emission rate (tn.pollutant/yr) = Non Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons

[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))

[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)

[4] Emission "factor" multiplied by 58% to convert to PM10 from TPM. Value of 58% from Table 12.1-2 AP-42 Chapter 12 "Primary Aluminum Production"

[5] Safety factor is a value used to adjust EGA provided data to adjust for differences in the operating environment.

[6] PM2.5 is value factored from TPM using industry ratio. (Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and

[7] VOC emissions calculated using 0.166 lb/hr from the CWPB1 Potline 5 - Century Aluminum of KY facility, scaled up to the number of pots at EGA-Inola

322-1
GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling

Pollutant	Control Device Capture Efficiency w/ FGD	Emissions Control Efficiency w/ FGD
Al2O3, Na3AlF6, AlF3 PM	100.00%	99.85%
SO2	100.00%	95.00%
HF	100.00%	99.96%
AlF3, Na3AlF6 PM	100.00%	99.96%
Al2O3, AlF3, Na3AlF6 PM2.5	100.00%	99.62%
CO	100.00%	0.00%
NOx	100.00%	0.00%

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Treated Emission Factor **(with FGD) [1]**	Release Point Type (stack, monovent, volume, area)	Emission Rate **(with FGD) [2]**	Safety Factor **[7]**	Emission Rate (with FGD) w/ Safety Factor [3]	Hourly ER (with FGD) w/ Safety Factor [4]	Emission Factor (with FGD) w/ Safety Factor [3]
						(tn.pollutant/year)		(tn.pollutant/year)		(tn.pollutant/year)	(lb/hr)	lb/ton FGD
0322-1	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM	tn.TPM/year	27.6	stack - GTC&FGD#1	27.6	25.00%	34.447	7.865	0.167
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	SO2	tn.SO2/year	318.1	stack - GTC&FGD#1	318.1	0.00%	318.072	72.619	1.539
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	HF	tn.F/year	60.2	stack - GTC&FGD#1	60.2	25.00%	75.201	17.169	0.364
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	AlF3, Na3AlF6 PM	tn.F/year	26.1	stack - GTC&FGD#1	26.1	25.00%	32.587	7.440	0.158
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM2.5 **[8]**	tn.PM2.5/year	17.6	stack - GTC&FGD#1	17.6	25.00%	22.030	5.030	0.107
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM10 **[5]**	tn.PM10/year	20.2	stack - GTC&FGD#1	20.2	25.00%	25.235	5.761	0.122
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	CO	tn.CO/year	34,221.8	stack - GTC&FGD#1	34221.8	25.00%	42777.257	9766.497	206.970
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	NOx	tn.NOx/year	15.8	stack - GTC&FGD#1	15.8	25.00%	19.704	4.499	0.095
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	VOC **[9]**	tn.VOC/year	69.9	stack - GTC&FGD#1	69.9	25.00%	87.352	19.943	0.423
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	PAH	tn.PAH/year	0.8	stack - GTC&FGD#1	0.8	25.00%	0.965	0.220	0.005
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	CO2 **[6]**	tn.CO2/year	636,585	stack - GTC&FGD#1	636,585	25.00%	795730.978	181673.739	3080.000
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	CF4 **[6]**	tn.CF4/year	248	stack - GTC&FGD#1	248	25.00%	310.025	70.782	1.200
	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	413,366.7	tn.Al/year	C2F6 **[6]**	tn.C2F6/year	25	stack - GTC&FGD#1	25	25.00%	31.003	7.078	0.120

Notes:
[1] Emission rate (tn.pollutant/yr) = Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate (tn.pollutant/yr) = Treated Emission "Factor" (tn.pollutant/yr)
[3] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety
[4] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)
[5] Emission "factor" multiplied by 73.26% to convert to PM10 from TPM. Value of 73.26% derived from Table 1 of Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and Environmental Impact as the ratio of the mean PM10 emission coefficient to the mean PMtotal emission coefficient using OTM27/28 results.
[6] Emission factor from AP-42 Table 12.1-3
[7] Safety factor is a value used to adjust EGA provided data to adjust for differences in the operating environment.
[8] Emission "factor" multiplied by 64.0% to convert to PM2.5 from TPM. Value of 64.0% derived from Table 2 of Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and Environmental Impact as the ratio of the mean PM10 emission coefficient to the mean PMtotal emission coefficient using OTM27/28 results.
[9] VOC emissions calculated using 0.166 lb/hr from the CWPB1 Potline 5 - Century Aluminum of KY facility, scaled up to the

CO2e Emissions

Pollutant	**Mass (tons)**	**GWP [1]**	**CO2e**
CO2	795731.0	1	795,731
CF4	310.0	7380	2,287,985
C2F6	31.0	12400	384,431
Total (tpy)			3,468,147

[1] Global warming potential values are from the AR6 update, dated August 7, 2024

322-2
GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling

Pollutant	Control Device Capture Efficiency w/ FGD	Emissions Control Efficiency w/ FGD
Al2O3, Na3AlF6, AlF3 PM	100.00%	99.85%
SO2	100.00%	95.00%
HF	100.00%	99.96%
AlF3, Na3AlF6 PM	100.00%	99.96%
Al2O3, AlF3, Na3AlF6 PM2.5	100.00%	99.62%
CO	100.00%	0.00%
NOx	100.00%	0.00%

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Treated Emission Factor **(with FGD) [1]**	Release Point Type (stack, monovent, volume, area)	Emission Rate **(with FGD) [2]**	Safety Factor **[7]**	Emission Rate (with FGD) w/ Safety Factor [3]	Hourly ER (with FGD) w/ Safety Factor [4]	Emission Factor (with FGD) w/ Safety Factor [3]
						(tn.pollutant/year)		(tn.pollutant/year)		(tn.pollutant/year)	(lb/hr)	lb/ton FGD
0322-2	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM	tn.TPM/year	27.6	stack - GTC&FGD#2	27.6	25.00%	34.447	7.865	0.167
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	SO2	tn.SO2/year	318.1	stack - GTC&FGD#2	318.1	0.00%	318.072	72.619	1.539
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	HF	tn.F/year	60.2	stack - GTC&FGD#2	60.2	25.00%	75.201	17.169	0.364
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	AlF3, Na3AlF6 PM	tn.F/year	26.1	stack - GTC&FGD#2	26.1	25.00%	32.587	7.440	0.158
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	Al2O3, AlF3, Na3AlF6 PM2.5 **[8]**	tn.PM2.5/year	17.6	stack - GTC&FGD#2	17.6	25.00%	22.030	5.030	0.107
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	Al2O3, Na3AlF6, AlF3 PM10 **[5]**	tn.PM10/year	20.2	stack - GTC&FGD#2	20.2	25.00%	25.235	5.761	0.122
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	CO	tn.CO/year	34,221.8	stack - GTC&FGD#2	34221.8	25.00%	42777.257	9766.497	206.970
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	NOx	tn.NOx/year	15.8	stack - GTC&FGD#2	15.8	25.00%	19.704	4.499	0.095
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	VOC [9]	tn.VOC/year	69.9	stack - GTC&FGD#2	69.9	25.00%	87.352	19.943	0.423
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	PAH	tn.PAH/year	0.8	stack - GTC&FGD#2	0.8	25.00%	0.965	0.220	0.005
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	CO2 **[6]**	tn.CO2/year	636,585	stack - GTC&FGD#2	636,584.8	25.00%	795730.978	181673.739	3080.000
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	CF4 **[6]**	tn.CF4/year	248	stack - GTC&FGD#2	248.0	25.00%	310.025	70.782	1.200
	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	413,366.7	tn.Al/year	C2F6 **[6]**	tn.C2F6/year	25	stack - GTC&FGD#2	24.8	25.00%	31.003	7.078	0.120

Notes:
[1] Emission rate (tn.pollutant/yr) = Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate (tn.pollutant/yr) = Treated Emission "Factor" (tn.pollutant/yr)
[3] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))
[4] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)
[5] Emission "factor" multiplied by 73.26% to convert to PM10 from TPM. Value of 73.26% derived from Table 1 of Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and Environmental Impact as the ratio of the mean PM10 emission coefficient to the mean PMtotal emission coefficient using OTM27/28 results.
[6] Emission factor from AP-42 Table 12.1-3
[7] Safety factor is a value used to adjust EGA provided data to adjust for differences in the operating environment.
[8] Emission "factor" multiplied by 64.0% to convert to PM2.5 from TPM. Value of 64.0% derived from Table 1 of Journal of the Air & Waste Management Association, PM2.5 Emissions from Aluminum Smelters: Coefficients and Environmental Impact as the ratio of the mean PM10 emission coefficient to the mean PMtotal emission coefficient using OTM27/28 results.
[9] VOC emissions calculated using 0.166 lb/hr from the CWPB1 Potline 5 - Century Aluminum of KY facility, scaled up to the number of pots at EGA-Inola

Conversions:
1tn (US ton) = 2000lbs

CO2e Emissions

Pollutant	**Mass (tons)**	**GWP [1]**	**CO2e**
CO2	795731.0	1	795,731
CF4	310.0	7380	2,287,985
C2F6	31.0	12400	384,431
Total (tpy)			3,468,147

[1] Global warming potential values are from the AR6 update, dated August 7, 2024

324-1
Fluorinated alumina handling & storage#1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0324-1	Fluorinated alumina handling & storage#1	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Fluorinated alumina handling & storage#1	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Fluorinated alumina handling & storage#1	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

324-2

Fluorinated alumina handling & storage#2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0324-2	Fluorinated alumina handling & storage#2	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Fluorinated alumina handling & storage#2	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Fluorinated alumina handling & storage#2	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

325-1

Crushed bath handling & storage#1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0325-1	Crushed bath handling & storage#1	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Crushed bath handling & storage#1	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Crushed bath handling & storage#1	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

325-2

Crushed bath handling & storage#2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0325-2	Crushed bath handling & storage#2	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Crushed bath handling & storage#2	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Crushed bath handling & storage#2	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

326-1

Anode cover material transportation PTM station room A1-1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-1	Anode cover material transportation PTM station room A1-1	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room A1-1	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room A1-1	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

326-2
Anode cover material transportation PTM station room A1-2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-2	Anode cover material transportation PTM station room A1-2	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room A1-2	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room A1-2	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

326-3
Anode cover material transportation PTM station room A2-1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-3	Anode cover material transportation PTM station room A2-1	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room A2-1	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room A2-1	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

326-4
Anode cover material transportation PTM station room A2-2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-4	Anode cover material transportation PTM station room A2-2	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room A2-2	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room A2-2	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

326-5
Anode cover material transportation PTM station room B1-1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-5	Anode cover material transportation PTM station room B1-1	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room B1-1	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room B1-1	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

326-6
Anode cover material transportation PTM station room B1-2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-6	Anode cover material transportation PTM station room B1-2	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room B1-2	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room B1-2	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

326-7
Anode cover material transportation PTM station room B2-1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-7	Anode cover material transportation PTM station room B2-1	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room B2-1	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room B2-1	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

326-8

Anode cover material transportation PTM station room B2-2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.5%
PM10	100.0%	99.5%
PM2.5	100.0%	99.5%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0326-8	Anode cover material transportation PTM station room B2-2	Al2O3, Na3AlF6, AlF3 PM	631.67	0.005	0.027	0.119
	Anode cover material transportation PTM station room B2-2	Al2O3, Na3AlF6, AlF3 PM2.5	631.67	0.0025	0.014	0.059
	Anode cover material transportation PTM station room B2-2	Al2O3, Na3AlF6, AlF3 PM10	631.67	0.005	0.027	0.119

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

328-1
Fresh alumina handling & storage#1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0328-1	Fresh alumina handling & storage#1	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Fresh alumina handling & storage#1	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Fresh alumina handling & storage#1	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

328-2

Fresh alumina handling & storage#2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0328-2	Fresh alumina handling & storage#2	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Fresh alumina handling & storage#2	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Fresh alumina handling & storage#2	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

EU_02 Potline Services
Potline Services

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e	Total Flourides		Flourine PM		PAH		HCl		HAPs	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
341-1	Cast iron melting Induction furnace operation	0.00	0.00	0.00	0.00	0.538	2.356	0.538	2.356	0.538	2.356	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
342-1	Potshell repair blasting operation	0.00	0.00	0.00	0.00	1.107	4.850	1.107	4.850	1.107	4.850	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
342-2	Pot delining operation	0.00	0.00	0.00	0.00	1.230	5.389	0.431	1.886	0.065	0.286	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-1	Crucible repair station operation	0.00	0.00	0.00	0.00	3.664	16.050	1.283	5.617	0.194	0.851	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-2	Crucible cleaning machine operation	0.00	0.00	0.00	0.00	3.664	16.050	1.283	5.617	0.194	0.851	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-3	Tube cleaning machine operation	0.00	0.00	0.00	0.00	3.664	16.050	1.283	5.617	0.194	0.851	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-4	Crucible lid cleaning operation	0.00	0.00	0.00	0.00	3.664	16.050	1.283	5.617	0.194	0.851	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-5	Metal Crucible Preheating Station	0.003	0.011	0.002	0.011	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	0.000	0.000	0.000	0.001	3.490	15.285	15.370	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
344-6	Bath Crucible Preheating Station	0.003	0.011	0.002	0.011	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	0.000	0.000	0.000	0.001	3.490	15.285	15.370	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
Total		0.005	0.022	0.005	0.021	17.531	76.796	7.208	31.564	2.486	10.896	0.000	0.000	0.000	0.001	6.980	30.571	30.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.10E-04	4.81E-04

Potential Controlled + Allowable Emission		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e	Total Flourides		Flourine PM		PAH		HCl		HAPs	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
341-1	Cast iron melting Induction furnace operation	0.00	0.00	0.00	0.00	0.097	0.427	0.097	0.427	0.049	0.213	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
342-1	Potshell repair blasting operation	0.00	0.00	0.00	0.00	0.731	3.202	0.731	3.202	0.731	3.202	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
342-2	Pot delining operation	0.00	0.00	0.00	0.00	4.061	17.786	4.061	17.786	2.030	8.893	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-1	Crucible repair station operation	0.00	0.00	0.00	0.00	0.292	1.281	0.292	1.281	0.146	0.640	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-2	Crucible cleaning machine operation	0.00	0.00	0.00	0.00	0.292	1.281	0.292	1.281	0.146	0.640	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-3	Tube cleaning machine operation	0.00	0.00	0.00	0.00	0.292	1.281	0.292	1.281	0.146	0.640	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-4	Crucible lid cleaning operation	0.00	0.00	0.00	0.00	0.292	1.281	0.292	1.281	0.146	0.640	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
344-5	Metal Crucible Preheating Station	0.003	0.011	0.002	0.011	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	0.000	0.000	0.000	0.001	3.490	15.285	15.370	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
344-6	Bath Crucible Preheating Station	0.003	0.011	0.002	0.011	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	0.000	0.000	0.000	0.001	3.490	15.285	15.370	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
Total		0.005	0.022	0.005	0.021	6.059	26.539	6.059	26.539	3.395	14.871	0.000	0.000	0.000	0.001	6.980	30.571	30.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.10E-04	4.81E-04

341-1

Cast iron melting Induction furnace operation

Pollutant	Control Device Capture	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0341-1	Cast iron melting Induction furnace operation	Al2O3, Na3AlF6, AlF3 PM	3790.04	0.003	0.097	0.427
	Cast iron melting Induction furnace operation	Al2O3, Na3AlF6, AlF3 PM2.5	3790.04	0.0015	0.049	0.213
	Cast iron melting Induction furnace operation	Al2O3, Na3AlF6, AlF3 PM10	3790.04	0.003	0.097	0.427

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

342-1

Potshell repair blasting operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0342-1	Potshell repair blasting operation	Al2O3, Na3AlF6, AlF3 PM	28425.30	0.003	0.731	3.202
	Potshell repair blasting operation	Al2O3, Na3AlF6, AlF3 PM2.5	28425.30	0.003	0.731	3.202
	Potshell repair blasting operation	Al2O3, Na3AlF6, AlF3 PM10	28425.30	0.003	0.731	3.202

Notes:

[1] No particle size adjustment

[2] Emission factor based on BACT limit for similar sources

342-2

Pot delining operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0342-2	Pot delining operation	Al2O3, Na3AlF6, AlF3 PM	157918.34	0.003	4.061	17.786
	Pot delining operation	Al2O3, Na3AlF6, AlF3 PM2.5	157918.34	0.0015	2.030	8.893
	Pot delining operation	Al2O3, Na3AlF6, AlF3 PM10	157918.34	0.003	4.061	17.786

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

344-1

Crucible repair station operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0344-1	Crucible repair station operation	Al2O3, Na3AlF6, AlF3 PM	11370.12	0.003	0.292	1.281
	Crucible repair station operation	Al2O3, Na3AlF6, AlF3 PM2.5	11370.12	0.0015	0.146	0.640
	Crucible repair station operation	Al2O3, Na3AlF6, AlF3 PM10	11370.12	0.003	0.292	1.281

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

344-2

Crucible cleaning machine operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0344-2	Crucible cleaning machine operation	Al2O3, Na3AlF6, AlF3 PM	11370.12	0.003	0.292	1.281
	Crucible cleaning machine operation	Al2O3, Na3AlF6, AlF3 PM2.5	11370.12	0.0015	0.146	0.640
	Crucible cleaning machine operation	Al2O3, Na3AlF6, AlF3 PM10	11370.12	0.003	0.292	1.281

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

344-3

Tube cleaning machine operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0344-3	Tube cleaning machine operation	Al2O3, Na3AlF6, AlF3 PM	11370.12	0.003	0.292	1.281
	Tube cleaning machine operation	Al2O3, Na3AlF6, AlF3 PM2.5	11370.12	0.0015	0.146	0.640
	Tube cleaning machine operation	Al2O3, Na3AlF6, AlF3 PM10	11370.12	0.003	0.292	1.281

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

344-4

Crucible lid cleaning operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0344-4	Crucible lid cleaning operation	Al2O3, Na3AlF6, AlF3 PM	11370.12	0.003	0.292	1.281
	Crucible lid cleaning operation	Al2O3, Na3AlF6, AlF3 PM2.5	11370.12	0.0015	0.146	0.640
	Crucible lid cleaning operation	Al2O3, Na3AlF6, AlF3 PM10	11370.12	0.003	0.292	1.281

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

344-5
Metal Crucible Preheating Station

Input	Value	Units	Notes
Operating Hours	8760	hours	
Heat Capacity	10	MMBtu/hr	[1]
NG Usage	254,758.32	scf/year	[2]

[1] Estimated heat capacity.
[2] Estimated natural gas usage based on projected facility-wide usage and estimate of usage distribution.

Pollutant	Emission Factor		Emissions	
	(lb/10^6 scf)	(lb/MMBtu)	lb/hr	tpy
PM	7.6	0.007	2.21E-04	9.68E-04
PM10	7.6	0.007	2.21E-04	9.68E-04
PM2.5	7.6	0.007	2.21E-04	9.68E-04
NOX	84	0.080	2.44E-03	1.07E-02
CO	86	0.082	2.50E-03	1.10E-02
SO2	0.6	0.001	1.74E-05	7.64E-05
Lead	0.0005	0.000	1.454E-08	6.369E-08
VOC	5.5	0.005	1.60E-04	7.01E-04
CO2	120000	113.768	3.490	15.285
N2O	2.2	0.002	6.40E-05	2.80E-04
CH4	2.3	0.002	6.69E-05	2.93E-04
CO2e	-	114.396	3.509	15.370
Benzene	0.0021	1.99E-06	6.11E-08	2.67E-07
Dichlorobenzene	0.0012	1.14E-06	3.49E-08	1.53E-07
Formaldehyde	0.075	7.11E-05	2.18E-06	9.55E-06
Hexane	1.8	1.71E-03	5.23E-05	2.29E-04
Naphthalene	0.00061	5.78E-07	1.77E-08	7.77E-08
Polycyclic Organic Matter	0.0000882	8.36E-08	2.57E-09	1.12E-08
Toluene	0.0034	3.22E-06	9.89E-08	4.33E-07
Arsenic	0.0002	1.90E-07	5.82E-09	2.55E-08
Beryllium	0.000012	1.14E-08	3.49E-10	1.53E-09
Cadmium	0.0011	1.04E-06	3.20E-08	1.40E-07
Chromium	0.0014	1.33E-06	4.07E-08	1.78E-07
Cobalt	0.000084	7.96E-08	2.44E-09	1.07E-08
Manganese	0.00038	3.60E-07	1.11E-08	4.84E-08
Mercury	0.00026	2.46E-07	7.56E-09	3.31E-08
Nickel	0.0021	1.99E-06	6.11E-08	2.67E-07
Selenium	0.000024	2.28E-08	6.98E-10	3.06E-09
Total HAP	-	0.002	5.49E-05	2.40E-04

Notes:
[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4
[2] Global warming potential values are from the AR6 update, dated August 7, 2024

344-6
Bath Crucible Preheating Station

Input	Value	Units	Notes
Operating Hours	8760	hours	
Heat Capacity	10	MMBtu/hr	[1]
NG Usage	254,758.32	scf/year	[2]

[1] Estimated heat capacity.

[2] Estimated natural gas usage based on projected facility-wide usage and estimate of usage distribution.

Pollutant	Emission Factor		Emissions	
	($lb/10^6$ scf)	(lb/MMBtu)	lb/hr	tpy
PM	7.6	0.007	2.21E-04	9.68E-04
PM10	7.6	0.007	2.21E-04	9.68E-04
PM2.5	7.6	0.007	2.21E-04	9.68E-04
NOX	84	0.080	2.44E-03	1.07E-02
CO	86	0.082	2.50E-03	1.10E-02
SO2	0.6	0.001	1.74E-05	7.64E-05
Lead	0.0005	0.000	1.454E-08	6.369E-08
VOC	5.5	0.005	1.60E-04	7.01E-04
CO2	120000	113.768	3.490	15.285
N2O	2.2	0.002	6.40E-05	2.80E-04
CH4	2.3	0.002	6.69E-05	2.93E-04
CO2e	-	114.396	3.509	15.370
Benzene	0.0021	1.99E-06	6.11E-08	2.67E-07
Dichlorobenzene	0.0012	1.14E-06	3.49E-08	1.53E-07
Formaldehyde	0.075	7.11E-05	2.18E-06	9.55E-06
Hexane	1.8	1.71E-03	5.23E-05	2.29E-04
Naphthalene	0.00061	5.78E-07	1.77E-08	7.77E-08
Polycyclic Organic Matter	0.0000882	8.36E-08	2.57E-09	1.12E-08
Toluene	0.0034	3.22E-06	9.89E-08	4.33E-07
Arsenic	0.0002	1.90E-07	5.82E-09	2.55E-08
Beryllium	0.000012	1.14E-08	3.49E-10	1.53E-09
Cadmium	0.0011	1.04E-06	3.20E-08	1.40E-07
Chromium	0.0014	1.33E-06	4.07E-08	1.78E-07
Cobalt	0.000084	7.96E-08	2.44E-09	1.07E-08
Manganese	0.00038	3.60E-07	1.11E-08	4.84E-08
Mercury	0.00026	2.46E-07	7.56E-09	3.31E-08
Nickel	0.0021	1.99E-06	6.11E-08	2.67E-07
Selenium	0.000024	2.28E-08	6.98E-10	3.06E-09
Total HAP	-	0.002	5.49E-05	2.40E-04

Notes:

[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4

[2] Global warming potential values are from the AR6 update, dated August 7, 2024

EU_03 Casthouse
Casting Operations

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
420-1	Casthouse billet casting furnace operation (6 stacks)	1.652	7.234	1.802	7.892	1.351	5.919	1.802	7.892	1.351	5.919	0.126	0.550	0.00	0.00	61.07	267.50
420-2	Casthouse PFA casting furnace operation (2 stacks)	0.708	3.100	0.772	3.382	0.579	2.537	0.772	3.382	0.579	2.537	0.054	0.236	0.00	0.00	61.07	267.50
420-3	Casthouse rod casting furnace operation (2 stacks)	0.393	1.722	0.429	1.879	0.322	1.409	0.429	1.879	0.322	1.409	0.030	0.131	0.00	0.00	61.07	267.50
420-4	Casthouse sheet casting furnace operation (3 stacks)	0.708	3.100	0.772	3.382	0.579	2.537	0.772	3.382	0.579	2.537	0.054	0.236	0.00	0.00	61.07	267.50
460-1	Sodium Reduction Station#1 (2 bays) operation	0.00	0.00	0.00	0.00	0.588	2.575	0.341	1.493	0.165	0.721	0.00	0.00	0.00	0.00	0.00	0.00
460-2	Sodium Reduction Station#2 (2 bays) operation	0.00	0.00	0.00	0.00	0.588	2.575	0.341	1.493	0.165	0.721	0.00	0.00	0.00	0.00	0.00	0.00
470-1	Casthouse dross press#1 operation	0.00	0.00	0.00	0.00	0.490	2.146	0.284	1.245	0.137	0.601	0.00	0.00	0.00	0.00	0.00	0.00
470-2	Casthouse dross press#2 operation	0.00	0.00	0.00	0.00	0.490	2.146	0.284	1.245	0.137	0.601	0.00	0.00	0.00	0.00	0.00	0.00
470-3	Casthouse dross press#3 operation	0.00	0.00	0.00	0.00	0.490	2.146	0.284	1.245	0.137	0.601	0.00	0.00	0.00	0.00	0.00	0.00
430-1	Mold Preheaters	2.50E-03	1.10E-02	2.44E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.5	15.3
430-2	Mold Coating Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.6	0.00	0.00
430-4	Ingot Marking	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.42	0.13	0.00	0.00
430-5	Billet Stamping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.42	0.13	0.00	0.00
Total		3.464	15.168	3.777	16.545	5.477	23.989	5.309	23.256	3.572	15.646	0.264	1.152	52.969	0.865	247.779	1085.270

CO2e	Total Flourides		Flourine PM		PAH		HCl		HAPs	
tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.154	0.675	0.154	0.675
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03	0.010
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03	0.010
1091.264	0.000	0.000	0.000	0.000	0.000	0.000	0.154	0.675	4.266	0.936

Potential Controlled + Allowable Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
420-1	Casthouse billet casting furnace operation (6 stacks)	1.652	7.234	1.802	7.892	1.351	5.919	1.802	7.892	1.351	5.919	0.126	0.550	1.35	5.92	61.07	267.50
420-2	Casthouse PFA casting furnace operation (2 stacks)	0.708	3.100	0.772	3.382	0.579	2.537	0.772	3.382	0.579	2.537	0.054	0.236	0.58	2.54	61.07	267.50
420-3	Casthouse rod casting furnace operation (2 stacks)	0.393	1.722	0.429	1.879	0.322	1.409	0.429	1.879	0.322	1.409	0.030	0.131	0.32	1.41	61.07	267.50
420-4	Casthouse sheet casting furnace operation (3 stacks)	0.708	3.100	0.772	3.382	0.579	2.537	3.382	3.382	0.579	2.537	0.054	0.236	0.58	2.54	61.07	267.50
460-1	Sodium Reduction Station#1 (2 bays) operation	0.00	0.00	0.00	0.00	0.650	2.846	0.650	2.846	0.325	1.423	0.00	0.00	0.00	0.00	0.00	0.00
460-2	Sodium Reduction Station#2 (2 bays) operation	0.00	0.00	0.00	0.00	0.650	2.846	0.650	2.846	0.325	1.423	0.00	0.00	0.00	0.00	0.00	0.00
470-1	Casthouse dross press#1 operation	0.00	0.00	0.00	0.00	0.054	0.237	0.054	0.237	0.027	0.119	0.00	0.00	0.00	0.00	0.00	0.00
470-2	Casthouse dross press#2 operation	0.00	0.00	0.00	0.00	0.054	0.237	0.054	0.237	0.027	0.119	0.00	0.00	0.00	0.00	0.00	0.00
470-3	Casthouse dross press#3 operation	0.00	0.00	0.00	0.00	0.054	0.237	0.054	0.237	0.027	0.119	0.00	0.00	0.00	0.00	0.00	0.00
430-1	Mold Preheaters	2.50E-03	1.10E-02	2.44E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.5	15.3
430-2	Mold Coating Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.6	0.00	0.00
430-4	Ingot Marking	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.42	0.13	0.00	0.00
430-5	Billet Stamping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.42	0.13	0.00	0.00
Total		3.464	15.168	3.777	16.545	4.293	18.805	7.847	22.939	3.562	15.603	0.264	1.152	55.800	13.266	247.779	1085.270

CO2e	Total Flourides		Flourine PM		PAH		HCl		HAPs	
tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
268.97	0.00	0.00	0.00	0.00	0.00	0.00	0.154	0.675	0.154	0.675
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03	0.010
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03	0.010
1091.264	0.000	0.000	0.000	0.000	0.000	0.000	0.154	0.675	4.266	0.936

420-1

Casthouse billet casting furnace operation (6 stacks)

Pollutant	Control Device Capture Efficiency	Emissions Control
SO2	100.0%	0.0%
Al2O3, Na3AlF6, AlF3 PM	100.0%	0.0%
HCl	100.0%	0.0%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	**Source Description**	**Capacity/ Throughput**	**Unit**	**Pollutant**	**Unit**	**Non Treated Emission Factor**	**Release Point Type (stack, monovent, volume, area)**	**Emission Rate [1]**	**Safety Factor [5]**	**Emission Rate w/ Safety Factor [2]**	**Hourly ER w/ Safety Factor [3]**
						(tn.pollutant /year)		**(tn.pollutant /year)**		**(tn.pollutant /year)**	**(lb/hr)**
0420-1	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	SO2	tn.SO2/year	0.500	stack - 0420-1	0.500	10.00%	0.550	0.126
	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	Al2O3, Na3AlF6, AlF3 PM **[4]**	tn.TPM/year	0.030	stack - 0420-1	0.030	0.00%	5.919	1.351
	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	Al2O3, Na3AlF6, AlF3 PM2.5 **[4]**	tn.PM2.5/year	0.030	stack - 0420-1	0.030	0.00%	5.919	1.351
	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	Al2O3, Na3AlF6, AlF3 PM10 **[4]**	tn.PM10/year	0.040	stack - 0420-1	0.040	0.00%	7.892	1.802
	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	HCl	tn.HCl/year	0.000	stack - 0420-1	0.000	25.00%	0.000	0.000
	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	VOC [4]	tn.VOC/year	0.030	stack - 0420-2	0.030	0.00%	5.919	1.351
	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	CO	tn.CO/year	5.787	stack - 0420-1	5.787	25.00%	7.234	1.652
	Casthouse billet casting furnace operation (6 stacks)	394,577	tn.billet/year	NOx	tn.NOx/year	6.313	stack - 0420-1	6.313	25.00%	7.892	1.802

Notes:

[1] Emission rate (tn.pollutant/yr) = Nontreated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons

[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))

[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)

[4] Emission factor in lb/ton from BACT determination for similar sources.

environment.

Pollutant	Emission Factor [1]		Emissions	
	(lb/10^6 scf)	(lb/MMBtu)	lb/hr	tpy
CO2	120000	113.768	61.072	267.496
N2O	2.2	0.002	0.001	0.005
CH4	2.3	0.002	0.001	0.005
CO2e	-	114.396	61.409	268.973

[1] Emission factors for natural gas combustion from AP-42 Table 1.4-2

[2] Emissions based on estimated annual natural gas usage

420-2
Casthouse PFA casting furnace operation (2 stacks)

Pollutant	Control Device Capture Efficiency	Emissions Control
SO2	100.0%	0.0%
Al2O3, Na3AlF6, AlF3 PM	100.0%	0.0%
HCl	100.0%	0.0%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	**Source Description**	**Capacity/ Throughput**	**Unit**	**Pollutant**	**Unit**	**Non Treated Emission Factor (tn.pollutant /year)**	**Release Point Type (stack, monovent, volume, area)**	**Emission Rate [1] (tn.pollutant /year)**	**Safety Factor [5]**	**Emission Rate w/ Safety Factor [2] (tn.pollutant /year)**	**Hourly ER w/ Safety Factor [3] (lb/hr)**
0420-2	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	SO2	tn.SO2/year	0.214	stack - 0420-2	0.214	10.00%	0.236	0.054
	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	Al2O3, Na3AlF6, AlF3 PM **[4]**	tn.TPM/year	0.030	stack - 0420-2	0.030	0.00%	2.537	0.579
	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	Al2O3, Na3AlF6, AlF3 PM2.5 **[4]**	tn.PM2.5/year	0.030	stack - 0420-2	0.030	0.00%	2.537	0.579
	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	Al2O3, Na3AlF6, AlF3 PM10 **[4]**	tn.PM10/year	0.040	stack - 0420-2	0.040	0.00%	3.382	0.772
	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	HCl	tn.HCl/year	0.000	stack - 0420-2	0.000	25.00%	0.000	0.000
	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	VOC **[4]**	tn.VOC/year	0.030	stack - 0420-2	0.030	0.00%	2.537	0.579
	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	CO	tn.CO/year	2.480	stack - 0420-2	2.480	25.00%	3.100	0.708
	Casthouse PFA casting furnace operation (2 stacks)	169,105	tn.PFA ingot/year	NOx	tn.NOx/year	2.706	stack - 0420-2	2.706	25.00%	3.382	0.772

Notes:

[1] Emission rate (tn.pollutant/yr) = Nontreated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons

[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))

[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)

[4] Emission factor in lb/ton from BACT determination for similar sources.
environment.

Pollutant	Emission Factor [1]		Emissions	
	($lb/10^6$ scf)	(lb/MMBtu)	lb/hr	tpy
CO2	120000	113.768	61.072	267.496
N2O	2.2	0.002	0.001	0.005
CH4	2.3	0.002	0.001	0.005
CO2e	-	114.396	61.409	268.973

[1] Emission factors for natural gas combustion from AP-42 Table 1.4-2
[2] Emissions based on estimated annual natural gas usage

420-3
Casthouse rod casting furnace operation (2 stacks)

Pollutant	Control Device Capture Efficiency	Emissions Control
SO2	100.0%	0.0%
Al2O3, Na3AlF6, AlF3 PM	100.0%	0.0%
HCl	100.0%	0.0%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	**Source Description**	**Capacity/ Throughput**	**Unit**	**Pollutant**	**Unit**	**Non Treated Emission Factor (tn.pollutant /year)**	**Release Point Type (stack, monovent, volume, area)**	**Emission Rate [1] (tn.pollutant /year)**	**Safety Factor [5]**	**Emission Rate w/ Safety Factor [2] (tn.pollutant /year)**	**Hourly ER w/ Safety Factor [3] (lb/hr)**
0420-3	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	SO2	tn.SO2/year	0.119	stack - 0420-3	0.119	10.00%	0.131	0.030
	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	Al2O3, Na3AlF6, AlF3 PM **[4]**	tn.TPM/year	0.030	stack - 0420-3	0.030	0.00%	1.409	0.322
	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	Al2O3, Na3AlF6, AlF3 PM2.5 **[4]**	tn.PM2.5/year	0.030	stack - 0420-3	0.030	0.00%	1.409	0.322
	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	Al2O3, Na3AlF6, AlF3 PM10 **[4]**	tn.PM10/year	0.040	stack - 0420-3	0.040	0.00%	1.879	0.429
	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	HCl	tn.HCl/year	0.000	stack - 0420-3	0.000	25.00%	0.000	0.000
	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	VOC **[4]**	tn.VOC/year	0.030	stack - 0420-4	0.030	0.00%	1.409	0.322
	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	CO	tn.CO/year	1.378	stack - 0420-3	1.378	25.00%	1.722	0.393
	Casthouse rod casting furnace operation (2 stacks)	93,947	tn.Rod/year	NOx	tn.NOx/year	1.503	stack - 0420-3	1.503	25.00%	1.879	0.429

Notes:
[1] Emission rate (tn.pollutant/yr) = Nontreated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))
[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)
[4] Emission factor in lb/ton from BACT determination for similar sources.
environment.

Pollutant	Emission Factor [1]		Emissions	
	($lb/10^6$ scf)	(lb/MMBtu)	lb/hr	tpy
CO2	120000	113.768	61.072	267.496
N2O	2.2	0.002	0.001	0.005
CH4	2.3	0.002	0.001	0.005
CO2e [2]	-	114.396	61.409	268.973

[1] Emission factors for natural gas combustion from AP-42 Table 1.4-2
[2] Emissions based on estimated annual natural gas usage

420-4

Casthouse sheet casting furnace operation (3 stacks)

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
SO2	100.0%	0.0%
Al2O3, Na3AlF6, AlF3 PM	100.0%	0.0%
HCl	100.0%	0.0%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	**Source Description**	**Capacity/ Throughput**	**Unit**	**Pollutant**	**Unit**	**Non Treated Emission Factor**	**Release Point Type (stack, monovent, volume, area)**	**Emission Rate [1]**	**Safety Factor [5]**	**Emission Rate w/ Safety Factor [2]**	**Hourly ER w/ Safety Factor [3]**
						(tn.pollutant /year)		**(tn.pollutant /year)**		**(tn.pollutant /year)**	**(lb/hr)**
0420-4	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	SO2	tn.SO2/year	0.214	stack - 0420-4	0.214	10.00%	0.236	0.054
	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	Al2O3, Na3AlF6, AlF3 PM **[4]**	tn.TPM/year	0.030	stack - 0420-4	0.030	0.00%	2.537	0.579
	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	Al2O3, Na3AlF6, AlF3 PM2.5 **[4]**	tn.PM2.5/ year	0.030	stack - 0420-4	0.030	0.00%	2.537	0.579
	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	Al2O3, Na3AlF6, AlF3 PM10 **[4]**	tn.PM10/ year	0.040	stack - 0420-4	0.040	0.00%	3.382	0.772
	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	HCl	tn.HCl/year	0.540	stack - 0420-4	0.540	25.00%	0.675	0.154
	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	VOC **[4]**	tn.VOC/year	0.030	stack - 0420-5	0.030	0.00%	2.537	0.579
	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	CO	tn.CO/year	2.480	stack - 0420-4	2.480	25.00%	3.100	0.708
	Casthouse sheet casting furnace operation (3 stacks)	169,105	tn.Sheet.ingot/year	NOx	tn.NOx/year	2.706	stack - 0420-4	2.706	25.00%	3.382	0.772

Notes:

[1] Emission rate (tn.pollutant/yr) = Nontreated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons

[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))

[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)

[4] Emission factor in lb/ton from BACT determination for similar sources.

environment.

Pollutant	Emission Factor [1]		Emissions	
	($lb/10^6$ scf)	(lb/MMBtu)	lb/hr	tpy
CO2	120000	113.768	61.072	267.496
N2O	2.2	0.002	0.001	0.005
CH4	2.3	0.002	0.001	0.005
CO2e	-	114.396	61.409	268.973

[1] Emission factors for natural gas combustion from AP-42 Table 1.4-2

[2] Emissions based on estimated annual natural gas usage

430-1
Mold Preheaters

Input	Value	Units	Notes
Operating Hours	8760	hours	
Heat Capacity	10	MMBtu/hr	[1]
NG Usage	254,758.32	scf/year	[2]

[1] Estimated heat capacity.

[2] Estimated natural gas usage based on projected facility-wide usage and estimate of usage distribution.

Pollutant	Emission Factor [1]		Emissions	
	($lb/10^6$ scf)	(lb/MMBtu)	lb/hr	tpy
PM	7.6	0.007	2.21E-04	9.68E-04
PM10	7.6	0.007	2.21E-04	9.68E-04
PM2.5	7.6	0.007	2.21E-04	9.68E-04
NOX	84	0.080	2.44E-03	1.07E-02
CO	86	0.082	2.50E-03	1.10E-02
SO2	0.6	0.001	1.74E-05	7.64E-05
Lead	0.0005	0.000	1.454E-08	6.369E-08
VOC	5.5	0.005	1.60E-04	7.01E-04
CO2	120000	113.768	3.490	15.285
N2O	2.2	0.002	6.40E-05	2.80E-04
CH4	2.3	0.002	6.69E-05	2.93E-04
CO2e [2]	-	114.396	3.509	15.370
Benzene	0.0021	1.99E-06	6.11E-08	2.67E-07
Dichlorobenzene	0.0012	1.14E-06	3.49E-08	1.53E-07
Formaldehyde	0.075	7.11E-05	2.18E-06	9.55E-06
Hexane	1.8	1.71E-03	5.23E-05	2.29E-04
Naphthalene	0.00061	5.78E-07	1.77E-08	7.77E-08
Polycyclic Organic Matter	0.0000882	8.36E-08	2.57E-09	1.12E-08
Toluene	0.0034	3.22E-06	9.89E-08	4.33E-07
Arsenic	0.0002	1.90E-07	5.82E-09	2.55E-08
Beryllium	0.000012	1.14E-08	3.49E-10	1.53E-09
Cadmium	0.0011	1.04E-06	3.20E-08	1.40E-07
Chromium	0.0014	1.33E-06	4.07E-08	1.78E-07
Cobalt	0.000084	7.96E-08	2.44E-09	1.07E-08
Manganese	0.00038	3.60E-07	1.11E-08	4.84E-08
Mercury	0.00026	2.46E-07	7.56E-09	3.31E-08
Nickel	0.0021	1.99E-06	6.11E-08	2.67E-07
Selenium	0.000024	2.28E-08	6.98E-10	3.06E-09
Total HAP	-	0.002	5.49E-05	2.40E-04

Notes:

[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4

[2] Global warming potential values are from the AR6 update, dated August 7, 2024

430-2
Mold Coating Systems

Operating Parameters	Value	Units	Basis
Material Name		-	
Usage rate	500	*gal/year*	assumed
Material VOC Content	25	*% or mass/vol*	assumed
Material HAP Content	10	*%*	assumed
Material Density	9.6	lb/gal	
Control Device	N/A	-	assumed
Capture Efficiency	N/A	*%*	assumed
Control Efficiency	N/A	*%*	assumed

Emissions Calculations

Pollutant	Uncontrolled Emissions Rate [1]		Controlled Emissions Rate [2]	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)
VOC	0.14	0.6	-	-
HAP	0.05	0.2	-	-

Notes:
[1] Uncontrolled emission rate = Usage rate * VOC content
[2] Controlled Emissions Rate = Uncontrolled Emission Rate * (Capture Efficiency %) * (1 - Control Efficiency %)
Conversions:
1ton = 2000lbs

430-4
Ingot Marking

Operating Paramete	Value	Units	Basis
Operating Hours	8760	hr/yr	
Rate	200	L/yr	assumed
Rate	20	L/hr	assumed
Control Device	N/A	-	assumed
Capture Efficiency	N/A	%	assumed
Control Efficiency	N/A	%	assumed

Emissions Calculations

Pollutant	Factor [1] [2]	Uncontrolled Emissions Rate [3]		Controlled Emissions Rate [4]	
	(kg/L)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
VOC	0.60	26.42	0.13	-	-
Total HAP	0.05	2.03	0.010	-	-

Notes:

[1] Emission rate based on limit from NSPS TT - Standards of Performance for Metal Coil Surface Coating (40 CFR 60.462).

[2] Emission rate based on limit from NESHAP SSSS - National Emission Standards for hazardous Air Pollutants: Surface Coating of Metal Coil (40 CFR 63.5120).

[3] Uncontrolled emission rate = Emission factor * Application rate

[4] Controlled Emissions Rate = Unctonrolled Emission Rate * (Capture Efficiency %) * (1 - Control Efficiency %)

Conversions:

1ton = 2000lbs

1kg = 2.205lbs

430-5
Billet Stamping

Operating Parameter	Value		Units	Basis
Operating Hours		8760	hr/yr	
Annual Application Rate		200	L/yr	assumed
Hourly Application Rate		20	L/hr	assumed
Control Device	N/A		-	assumed
Capture Efficiency	N/A		%	assumed
Control Efficiency	N/A		%	assumed

Emissions Calculations

	Emission Factor [1] [2]	Uncontrolled Emissions Rate		Controlled Emissions Rate [4]	
Pollutant	(kg/L)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
VOC	0.60	26.42	0.13	-	-
Total HAP	0.05	2.03	0.010	-	-

Notes:

[1] Emission rate based on limit from NSPS TT - Standards of Performance for Metal Coil Surface Coating (40 CFR 60.462).

[2] Emission rate based on limit from NESHAP SSSS - National Emission Standards for hazardous Air Pollutants: Surface Coating of Metal Coil (40 CFR 63.5120).

[3] Uncontrolled emission rate = Emission factor * Application rate
[4] Controlled Emissions Rate = Unctonrolled Emission Rate * (Capture Efficiency %) * (1 - Control Efficiency %)
Conversions:
1ton = 2000lbs
1kg = 2.205lbs

460-1
Sodium Reduction Station#1 (2 bays) operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0460-1	Sodium Reduction Station#1 (2 bays) operation	Al2O3, Na3AlF6, AlF3 PM	15160.16	0.005	0.650	2.846
	Sodium Reduction Station#1 (2 bays) operation	Al2O3, Na3AlF6, AlF3 PM2.5	15160.16	0.0025	0.325	1.423
	Sodium Reduction Station#1 (2 bays) operation	Al2O3, Na3AlF6, AlF3 PM10	15160.16	0.005	0.650	2.846

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

460-2

Sodium Reduction Station#2 (2 bays) operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0460-2	Sodium Reduction Station#2 (2 bays) operation	Al2O3, Na3AlF6, AlF3 PM	15160.16	0.005	0.650	2.846
	Sodium Reduction Station#2 (2 bays) operation	Al2O3, Na3AlF6, AlF3 PM2.5	15160.16	0.0025	0.325	1.423
	Sodium Reduction Station#2 (2 bays) operation	Al2O3, Na3AlF6, AlF3 PM10	15160.16	0.005	0.650	2.846

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

470-1

Casthouse dross press#1 operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0470-1	Casthouse dross press#1 operation	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Casthouse dross press#1 operation	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Casthouse dross press#1 operation	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

470-2

Casthouse dross press#2 operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0470-2	Casthouse dross press#2 operation	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Casthouse dross press#2 operation	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Casthouse dross press#2 operation	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

470-3

Casthouse dross press#3 operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0470-3	Casthouse dross press#3 operation	Al2O3, Na3AlF6, AlF3 PM	1263.35	0.005	0.054	0.237
	Casthouse dross press#3 operation	Al2O3, Na3AlF6, AlF3 PM2.5	1263.35	0.0025	0.027	0.119
	Casthouse dross press#3 operation	Al2O3, Na3AlF6, AlF3 PM10	1263.35	0.005	0.054	0.237

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

EU_04 Carbon Area
Carbon Area Sources

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e	Total Flourides	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**	**lb/hr**	**tpy**
210-1	Paste Plant Coke handling and storage operation	0.00	0.00	0.00	0.00	1.19	5.22	0.42	1.83	0.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-2	crushing & screening operation	0.00	0.00	0.00	0.00	1.19	5.22	0.42	1.83	0.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-3	Paste Plant proportioning and pre-heating operation	0.00	0.00	0.00	0.00	1.19	5.22	0.42	1.83	0.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-4	Paste Plant#1 vertical mill	0.00	0.00	0.00	0.00	1.19	5.22	0.42	1.83	0.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-5	Paste Plant#2 vertical mill	0.00	0.00	0.00	0.00	1.19	5.22	0.42	1.83	0.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-6	Paste plant#1 CTP storage, paste mixing & forming operation	0.76	3.31	0.66	2.89	0.17	0.73	0.06	0.25	0.01	0.04	1.11	4.88	14.16	62.01	0.00	0.00	0.00	0.01	0.05
210-7	Paste plant#2 CTP storage, paste mixing & forming operation	0.76	3.31	0.66	2.89	0.17	0.73	0.06	0.25	0.01	0.04	1.11	4.88	14.16	62.01	0.00	0.00	0.00	0.01	0.05
210-8	Paste plant HTM gas boiler operation	0.02	0.07	0.09	0.40	3.09E-03	1.36E-02	3.09E-03	1.36E-02	3.09E-03	1.36E-02	2.44E-04	1.07E-03	2.24E-03	9.81E-03	48.86	214.00	215.18	0.00	0.00
211-6	Paste Plant Preheater #1	2.50E-03	1.10E-02	2.44E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.49	15.29	15.37	0.00	0.00
211-7	Paste Plant Preheater #2	2.50E-03	1.10E-02	2.44E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.49	15.29	15.37	0.00	0.00
220-1	Anode cleaning & slot cutting#1 operation	0.00	0.00	0.00	0.00	7.90	34.58	2.76	12.10	0.42	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
220-2	Anode cleaning & slot cutting#2 operation	0.00	0.00	0.00	0.00	7.90	34.58	2.76	12.10	0.42	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230-1	Baking fires and FTC operation ABF#1	71.16	311.68	28.08	122.98	110.11	482.26	110.11	482.26	84.70	370.97	82.88	363.02	15.25	66.77	85.50	374.49	376.56	39.32	172.24
230-2	Baking fires and FTC operation ABF#2	71.16	311.68	28.08	122.98	110.11	482.26	110.11	482.26	84.70	370.97	82.88	363.02	15.25	66.77	85.50	374.49	376.56	39.32	172.24
240-1	Butt cleaning operation	0.00	0.00	0.00	0.00	12.27	53.75	4.30	18.81	0.65	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-2	Butt pre-cleaning operation	0.00	0.00	0.00	0.00	12.27	53.75	4.30	18.81	0.65	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-3	Butt shot blasting operation	0.00	0.00	0.00	0.00	9.21	40.32	3.22	14.11	0.49	2.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-4	Butt & thimble press operation	0.00	0.00	0.00	0.00	2.17	9.49	0.76	3.32	0.12	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-5	Butt transfer car operation	0.00	0.00	0.00	0.00	12.27	53.75	4.30	18.81	0.65	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-6	Cast iron recycling operation	0.00	0.00	0.00	0.00	3.25	14.23	3.25	14.23	3.25	14.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-7	Cast iron melting Induction furnace operation	0.00	0.00	0.00	0.00	2.98	13.04	2.98	13.04	2.98	13.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-8	Stem brushing operation	0.00	0.00	0.00	0.00	1.08	4.74	0.63	2.75	0.30	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-9	Stub shot blasting operation	0.00	0.00	0.00	0.00	12.27	53.75	12.27	53.75	12.27	53.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
241-10	Stub Hole Pre-Heating Station	2.50E-03	1.10E-02	2.45E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.49	15.29	15.37	0.00	0.00
250-1	Bath handling & storage	0.00	0.00	0.00	0.00	12.27	53.75	4.30	18.81	0.65	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-2	operation	0.00	0.00	0.00	0.00	24.60	107.73	8.61	37.71	1.30	5.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-3	Cavity bath handling	0.00	0.00	0.00	0.00	12.27	53.75	4.30	18.81	0.65	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-4	Pure Bath Silo	0.00	0.00	0.00	0.00							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260-1	Butts crushing operation	0.00	0.00	0.00	0.00	16.70	73.12	5.84	25.59	0.89	3.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260-2	storage	0.00	0.00	0.00	0.00	0.39	1.71	0.14	0.60	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**143.85**	**630.07**	**57.58**	**252.17**	**376.30**	**1648.19**	**287.11**	**1257.58**	**195.43**	**856.00**	**167.99**	**735.80**	**58.80**	**257.57**	**230.33**	**1008.84**	**1014.41**	**78.67**	**344.58**

Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	15.38	67.36	0.00	0.00	0.01	0.02
0.00	0.00	15.38	67.36	0.00	0.00	0.01	0.02
0.00	0.00	0.00	0.00	0.00	0.00	7.69E-04	3.37E-03
0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	1.69	7.42	0.00	0.00	15.73	68.89
0.00	0.00	1.69	7.42	0.00	0.00	15.73	68.89
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	**0.00**	**34.15**	**149.57**	**0.00**	**0.00**	**31.47**	**137.84**

Potential Controlled + Allowable Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e	Total Flourides	
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**	**lb/hr**	**tpy**
210-1	Paste Plant Coke handling and storage operation	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-2	crushing & screening operation	0.00	0.00	0.00	0.00	0.51	2.23	0.51	2.23	0.25	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-3	Paste Plant proportioning and pre-heating operation	0.00	0.00	0.00	0.00	0.35	1.52	0.35	1.52	0.17	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-4	Paste Plant#1 vertical mill	0.00	0.00	0.00	0.00	1.41	6.17	1.41	6.17	0.70	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-5	Paste Plant#2 vertical mill	0.00	0.00	0.00	0.00	1.41	6.17	1.41	6.17	0.70	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210-6	Paste plant#1 CTP storage, paste mixing & forming operation	0.76	3.31	0.66	2.89	0.16	0.70	0.16	0.70	0.16	0.70	1.11	4.88	0.13	0.56	0.00	0.00	0.00	0.01	0.05
210-7	Paste plant#2 CTP storage, paste mixing & forming operation	0.76	3.31	0.66	2.89	0.16	0.70	0.16	0.70	0.16	0.70	1.11	4.88	0.13	0.56	0.00	0.00	0.00	0.01	0.05
210-8	Paste plant HTM gas boiler operation	0.02	0.07	0.09	0.40	3.09E-03	1.36E-02	3.09E-03	1.36E-02	3.09E-03	1.36E-02	2.44E-04	1.07E-03	2.24E-03	9.81E-03	48.86	214.00	215.18	0.00	0.00
211-6	Paste Plant Preheater #1	2.50E-03	1.10E-02	2.44E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.49	15.29	15.37	0.00	0.00
211-7	Paste Plant Preheater #2	2.50E-03	1.10E-02	2.44E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.49	15.29	15.37	0.00	0.00
220-1	Anode cleaning & slot cutting#1 operation	0.00	0.00	0.00	0.00	0.95	4.15	0.95	4.15	0.47	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
220-2	Anode cleaning & slot cutting#2 operation	0.00	0.00	0.00	0.00	0.95	4.15	0.95	4.15	0.47	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230-1	Baking fires and FTC operation ABF#1	71.16	311.68	28.08	122.98	1.79	7.84	1.08	4.74	1.07	4.69	82.88	363.02	1.47	6.43	85.50	374.49	376.56	0.51	2.24
230-2	Baking fires and FTC operation ABF#2	71.16	311.68	28.08	122.98	1.79	7.84	1.08	4.74	1.07	4.69	82.88	363.02	1.47	6.43	85.50	374.49	376.56	0.51	2.24
240-1	Butt cleaning operation	0.00	0.00	0.00	0.00	0.92	4.03	0.92	4.03	0.46	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-2	Butt pre-cleaning operation	0.00	0.00	0.00	0.00	0.92	4.03	0.92	4.03	0.46	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-3	Butt shot blasting operation	0.00	0.00	0.00	0.00	0.55	2.42	0.55	2.42	0.55	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-4	Butt & thimble press operation	0.00	0.00	0.00	0.00	0.65	2.85	0.65	2.85	0.32	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-5	Butt transfer car operation	0.00	0.00	0.00	0.00	0.92	4.03	0.92	4.03	0.46	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-6	Cast iron recycling operation	0.00	0.00	0.00	0.00	0.65	2.85	0.65	2.85	0.32	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-7	Cast iron melting Induction furnace operation	0.00	0.00	0.00	0.00	0.32	1.42	0.32	1.42	0.16	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-8	Stem brushing operation	0.00	0.00	0.00	0.00	0.08	0.36	0.08	0.36	0.04	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-9	Stub shot blasting operation	0.00	0.00	0.00	0.00	0.55	2.42	0.55	2.42	0.55	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
241-10	Stub Hole Pre-Heating Station	2.50E-03	1.10E-02	2.45E-03	1.07E-02	2.21E-04	9.68E-04	2.21E-04	9.68E-04	2.21E-04	9.68E-04	1.74E-05	7.64E-05	1.60E-04	7.01E-04	3.49	15.29	15.37	0.00	0.00
250-1	Bath handling & storage	0.00	0.00	0.00	0.00	0.92	4.03	0.92	4.03	0.46	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-2	Bath processing facility operation	0.00	0.00	0.00	0.00	2.03	8.89	2.03	8.89	1.02	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-3	Cavity bath handling	0.00	0.00	0.00	0.00	0.92	4.03	0.92	4.03	0.46	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-4	Pure Bath Silo	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260-1	Butts crushing operation	0.00	0.00	0.00	0.00	0.40	1.75	0.40	1.75	0.20	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260-2	Carbon recycled material storage	0.00	0.00	0.00	0.00	0.05	0.23	0.05	0.23	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**143.85**	**630.07**	**57.58**	**252.17**	**19.58**	**85.77**	**18.17**	**79.57**	**10.85**	**47.55**	**167.99**	**735.80**	**3.19**	**13.98**	**230.33**	**1008.84**	**1014.41**	**1.04**	**4.58**

Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.14	0.61	0.00	0.00	0.01	0.05
0.00	0.00	0.14	0.61	0.00	0.00	0.01	0.05
0.00	0.00	0.00	0.00	0.00	0.00	7.69E-04	3.37E-03
0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.31	1.34	1.28	5.60	0.00	0.00	0.20	0.90
0.31	1.34	1.28	5.60	0.00	0.00	0.20	0.90
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	2.40E-04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.61	**2.69**	**2.83**	**12.41**	**0.00**	**0.00**	**0.43**	**1.89**

210-1
Paste Plant Coke handling and storage operation

Pollutant	Capture Efficiency	Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0210-1	Paste Plant Coke handling and storage operation	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	Paste Plant Coke handling and storage operation	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	Paste Plant Coke handling and storage operation	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

210-2
Paste Plant dry matter crushing & screening operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Descriptio	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0210-2	Paste Plant dry matter crushing & screening operation	Al2O3, Na3AlF6, AlF3 PM	11875.46	0.005	0.509	2.229
	Paste Plant dry matter crushing & screening operation	Al2O3, Na3AlF6, AlF3 PM2.5	11875.46	0.0025	0.254	1.115
	Paste Plant dry matter crushing & screening operation	Al2O3, Na3AlF6, AlF3 PM10	11875.46	0.005	0.509	2.229

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

210-3
Paste Plant proportioning and pre-heating operation

Pollutant	Control Device Capture	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0210-3	Paste Plant proportioning and pre-heating operation	Al2O3, Na3AlF6, AlF3 PM	8085.42	0.005	0.347	1.518
	Paste Plant proportioning and pre-heating operation	Al2O3, Na3AlF6, AlF3 PM2.5	8085.42	0.0025	0.173	0.759
	Paste Plant proportioning and pre-heating operation	Al2O3, Na3AlF6, AlF3 PM10	8085.42	0.005	0.347	1.518

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

210-4
Paste Plant#1 vertical mill

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0210-4	Paste Plant#1 vertical mill	Al2O3, Na3AlF6, AlF3 PM	32847.01	0.005	1.408	6.166
	Paste Plant#1 vertical mill	Al2O3, Na3AlF6, AlF3 PM2.5	32847.01	0.0025	0.704	3.083
	Paste Plant#1 vertical mill	Al2O3, Na3AlF6, AlF3 PM10	32847.01	0.005	1.408	6.166

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

210-5
Paste Plant#2 vertical mill

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0210-5	Paste Plant#2 vertical mill	Al2O3, Na3AlF6, AlF3 PM	32847.01	0.005	1.408	6.166
	Paste Plant#2 vertical mill	Al2O3, Na3AlF6, AlF3 PM2.5	32847.01	0.0025	0.704	3.083
	Paste Plant#2 vertical mill	Al2O3, Na3AlF6, AlF3 PM10	32847.01	0.005	1.408	6.166

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

210-6
Paste plant#1 CTP storage, paste mixing & forming operation
RTO control

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
SO2	100.0%	0.0%
HF	90.0%	0.0%
AlF3, Na3AlF6 PM	90.0%	0.0%
C, Na3AlF6, AlF3 PM	90.0%	0.0%
PAH	90.0%	99.0%
Volatile Organic Compounds	90.0%	99.0%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Treated Emission Factor (tn.pollutant /year	Release Point Type (stack, monovent, volume, area)	Emission Rate [1] (tn.pollutant /year)	Safety Factor [4]	Emission Rate w/ Safety Factor [2] (tn.pollutant /year)	Hourly ER w/ Safety Factor [3] (lb/hr)
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	SO2	tn.SO2/year	4.437	stack- 0210-6	4.437	10.00%	4.880	1.114
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	TF	tn.F/year	0.039	stack- 0210-6	0.039	25.00%	0.049	0.011
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	HF	tn.F/year	0.02	stack- 0210-6	0.0160	25.00%	0.020	0.005
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	C, Na3AlF6, AlF3 PM **[5]**	tn.TPM/year	0.0056	stack- 0210-6	0.0056	0.00%	0.702	0.160
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	C, Na3AlF6, AlF3 PM2.5 **[5]**	tn.PM2.5/year	0.0056	stack- 0210-6	0.0056	0.00%	0.702	0.160
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	C, Na3AlF6, AlF3 PM10 **[5]**	tn.PM10/year	0.0056	stack- 0210-6	0.0056	0.00%	0.702	0.160
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	PAH	tn.PAH/year	0.49	stack- 0210-6	0.4850	25.00%	0.606	0.138
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	Volatile Organic Compounds	tn.VOC/year	0.45	stack- 0210-6	0.4464	25.00%	0.558	0.127
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	CO	tn.CO/year	2.65	stack- 0210-6	2.6455	25.00%	3.307	0.755
0210-6	Paste plant#1 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	NOx	tn.NOx/year	2.31	stack- 0210-6	2.3149	25.00%	2.894	0.661

Notes:
[1] Emission rate (tn.pollutant/yr) = Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))
[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)
[4] Safety factor is a value used to adjust EGA provided data to adjust for differences in operating environment.
[5] PM/PM10/PM2.5 emission rates based on the MACT

210-7
Paste plant#2 CTP storage, paste mixing & forming operation
RTO control

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
SO2	100.0%	0.0%
HF	90.0%	0.0%
AlF3, Na3AlF6 PM	90.0%	0.0%
C, Na3AlF6, AlF3 PM	90.0%	0.0%
PAH	90.0%	99.0%
Compounds	90.0%	99.0%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	**Source Description**	**Capacity/ Throughput**	**Unit**	**Pollutant**	**Unit**	**Treated Emission Factor (tn.pollutant /year**	**Release Point Type (stack, monovent, volume, area)**	**Emission Rate [1] (tn.pollutant /year)**	**Safety Factor [4]**	**Emission Rate w/ Safety Factor [2] (tn.pollutant /year)**	**Hourly ER w/ Safety Factor [3] (lb/hr)**
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	SO2	tn.SO2/year	4.437	stack- 0210-7	4.437	10.00%	4.880	1.114
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	TF	tn.F/year	0.039	stack- 0210-7	0.039	25.00%	0.049	0.011
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	HF	tn.F/year	0.02	stack- 0210-7	0.0160	25.00%	0.020	0.005
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	C, Na3AlF6, AlF3 PM **[5]**	tn.TPM/year	0.0056	stack- 0210-7	0.0056	0.00%	0.702	0.160
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	C, Na3AlF6, AlF3 PM2.5 **[5]**	tn.PM2.5/year	0.0056	stack- 0210-7	0.0056	0.00%	0.702	0.160
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	C, Na3AlF6, AlF3 PM10 **[5]**	tn.PM10/year	0.0056	stack- 0210-7	0.0056	0.00%	0.702	0.160
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	PAH	tn.PAH/year	0.49	stack- 0210-7	0.4850	25.00%	0.606	0.138
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	Volatile Organic Compounds	tn.VOC/year	0.45	stack- 0210-7	0.4464	25.00%	0.558	0.127
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	CO	tn.CO/year	2.65	stack- 0210-7	2.6455	25.00%	3.307	0.755
0210-7	Paste plant#2 CTP storage, paste mixing & forming operation	250,781	tn.Green paste/year	NOx	tn.NOx/year	2.31	stack- 0210-7	2.3149	25.00%	2.894	0.661

Notes:
[1] Emission rate (tn.pollutant/yr) = Treated Emission Factor (tn.pollutant/year) from production adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))
[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) / (8760hr/yr)
[4] Safety factor is a value used to adjust EGA provided data to adjust for differences in operating environment.
[5] PM/PM10/PM2.5 emission rates based on the MACT

210-8
Paste plant HTM gas boiler operation

Input	Value	Units	Notes
Operating Hours	8760	hours	
Heat Capacity	20	MMBtu/hr	[1]
NG Usage	3,566,616.48	scf/year	[2]

[1] Estimated heat capacity
[2] Estimated natural gas usage based on projected facility-wide usage and estimate of usage distribution.

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant	Unit	Non Treated Emission Factor (tn.pollutant/ year)	Release Point Type (stack, monovent, volume, area)	Emission Rate [1] (tn.pollutant / year)	Safety Factor [4]	Emission Rate w/ Safety Factor [2] (tn.pollutant/ year)	Hourly ER w/ Safety Factor [3] (lb/hr)
0210-8	Paste plant HTM gas boiler operation	501,561.27	tn.Green paste/year	CO	tn.CO/year	0.055	stack- 0210-8	0.055	25.00%	0.069	0.016
	Paste plant HTM gas boiler operation	501,561.27	tn.Green paste/year	NOx	tn.NOx/year	0.322	stack- 0210-8	0.322	25.00%	0.402	0.092

Notes:
[1] Emission rate (tn.pollutant/yr) = Non Treated Emission Factor (tn.pollutant/year) from production
adjusted EGA - Al Taweelah data converted from metric tonnes to US tons
[2] Emission rate w/ Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))
[3] Hourly ER w/ Safety Factor (lb/hr) = Emission rate w/ Safety Factor (tn.pollutant/yr) * (2000lb/ton) /
[4] Safety factor is a value used to adjust EGA provided data to adjust for differences in operating
Conversions:
1tn. (US ton) = 2000lbs

Pollutant	Emission Factor		Emissions	
	(lb/10^6 scf)	(lb/MMBtu)	lb/hr	tpy
Filterable PM	7.6	0.007	0.003	0.014
PM10	7.6	0.007	0.003	0.014
PM2.5	7.6	0.007	0.003	0.014
SO2	0.6	0.001	0.000	0.001
Lead	0.0005	0.000	2.04E-07	8.92E-07
VOC	5.5	0.005	0.002	0.010
CO2	120000	113.768	48.858	213.997
N2O	2.2	0.002	0.001	0.004
CH4	2.3	0.002	0.001	0.004
CO2e	-	114.396	49.128	215.179
Benzene	0.0021	1.99E-06	8.55E-07	3.74E-06
Dichlorobenzene	0.0012	1.14E-06	4.89E-07	2.14E-06
Formaldehyde	0.075	7.11E-05	3.05E-05	1.34E-04
Hexane	1.8	1.71E-03	7.33E-04	3.21E-03
Naphthalene	0.00061	5.78E-07	2.48E-07	1.09E-06
cyclic Organic Ma	0.0000882	8.36E-08	3.59E-08	1.57E-07
Toluene	0.0034	3.22E-06	1.38E-06	6.06E-06
Arsenic	0.0002	1.90E-07	8.14E-08	3.57E-07
Beryllium	0.000012	1.14E-08	4.89E-09	2.14E-08
Cadmium	0.0011	1.04E-06	4.48E-07	1.96E-06
Chromium	0.0014	1.33E-06	5.70E-07	2.50E-06
Cobalt	0.000084	7.96E-08	3.42E-08	1.50E-07
Manganese	0.00038	3.60E-07	1.55E-07	6.78E-07
Mercury	0.00026	2.46E-07	1.06E-07	4.64E-07
Nickel	0.0021	1.99E-06	8.55E-07	3.74E-06
Selenium	0.000024	2.28E-08	9.77E-09	4.28E-08
Total HAP	-	0.002	7.69E-04	3.37E-03

211-6
Paste Plant Preheater #1

Input	Value	Units	Notes
Operating Hours	8760	hours	
Heat Capacity	10	MMBtu/hr	[1]
NG Usage	254,758.32	scf/year	[2]

[1] Estimated heat capacity.

[2] Estimated natural gas usage based on projected facility-wide usage and estimate of usage distribution.

Pollutant	Emission Factor		Emissions	
	($lb/10^6$ scf)	(lb/MMBtu)	lb/hr	tpy
PM	7.6	0.007	2.21E-04	9.68E-04
PM10	7.6	0.007	2.21E-04	9.68E-04
PM2.5	7.6	0.007	2.21E-04	9.68E-04
NOX	84	0.080	2.44E-03	1.07E-02
CO	86	0.082	2.50E-03	1.10E-02
SO2	0.6	0.001	1.74E-05	7.64E-05
Lead	0.0005	0.000	1.454E-08	6.369E-08
VOC	5.5	0.005	1.60E-04	7.01E-04
CO2	120000	113.768	3.490	15.285
N2O	2.2	0.002	6.40E-05	2.80E-04
CH4	2.3	0.002	6.69E-05	2.93E-04
CO2e	-	114.396	3.509	15.370
Benzene	0.0021	1.99E-06	6.11E-08	2.67E-07
Dichlorobenzene	0.0012	1.14E-06	3.49E-08	1.53E-07
Formaldehyde	0.075	7.11E-05	2.18E-06	9.55E-06
Hexane	1.8	1.71E-03	5.23E-05	2.29E-04
Naphthalene	0.00061	5.78E-07	1.77E-08	7.77E-08
Polycyclic Organic Matter	0.0000882	8.36E-08	2.57E-09	1.12E-08
Toluene	0.0034	3.22E-06	9.89E-08	4.33E-07
Arsenic	0.0002	1.90E-07	5.82E-09	2.55E-08
Beryllium	0.000012	1.14E-08	3.49E-10	1.53E-09
Cadmium	0.0011	1.04E-06	3.20E-08	1.40E-07
Chromium	0.0014	1.33E-06	4.07E-08	1.78E-07
Cobalt	0.000084	7.96E-08	2.44E-09	1.07E-08
Manganese	0.00038	3.60E-07	1.11E-08	4.84E-08
Mercury	0.00026	2.46E-07	7.56E-09	3.31E-08
Nickel	0.0021	1.99E-06	6.11E-08	2.67E-07
Selenium	0.000024	2.28E-08	6.98E-10	3.06E-09
Total HAP	-	0.002	5.49E-05	2.40E-04

Notes:

[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4

[2] Global warming potential values are from the AR6 update, dated August 7, 2024

211-7
Paste Plant Preheater #2

Input	Value	Units	Notes
Operating Hours	8760	hours	
Heat Capacity	10	MMBtu/hr	[1]
NG Usage	254,758.32	scf/year	[2]

[1] Estimated heat capacity.

[2] Estimated natural gas usage based on projected facility-wide usage and estimate of usage distribution.

Pollutant	Emission Factor		Emissions	
	(lb/10^6 scf)	(lb/MMBtu)	lb/hr	tpy
PM	7.6	0.007	2.21E-04	9.68E-04
PM10	7.6	0.007	2.21E-04	9.68E-04
PM2.5	7.6	0.007	2.21E-04	9.68E-04
NOX	84	0.080	2.44E-03	1.07E-02
CO	86	0.082	2.50E-03	1.10E-02
SO2	0.6	0.001	1.74E-05	7.64E-05
Lead	0.0005	0.000	1.454E-08	6.369E-08
VOC	5.5	0.005	1.60E-04	7.01E-04
CO2	120000	113.768	3.490	15.285
N2O	2.2	0.002	6.40E-05	2.80E-04
CH4	2.3	0.002	6.69E-05	2.93E-04
CO2e	-	114.396	3.509	15.370
Benzene	0.0021	1.99E-06	6.11E-08	2.67E-07
Dichlorobenzene	0.0012	1.14E-06	3.49E-08	1.53E-07
Formaldehyde	0.075	7.11E-05	2.18E-06	9.55E-06
Hexane	1.8	1.71E-03	5.23E-05	2.29E-04
Naphthalene	0.00061	5.78E-07	1.77E-08	7.77E-08
Polycyclic Organic Matter	0.0000882	8.36E-08	2.57E-09	1.12E-08
Toluene	0.0034	3.22E-06	9.89E-08	4.33E-07
Arsenic	0.0002	1.90E-07	5.82E-09	2.55E-08
Beryllium	0.000012	1.14E-08	3.49E-10	1.53E-09
Cadmium	0.0011	1.04E-06	3.20E-08	1.40E-07
Chromium	0.0014	1.33E-06	4.07E-08	1.78E-07
Cobalt	0.000084	7.96E-08	2.44E-09	1.07E-08
Manganese	0.00038	3.60E-07	1.11E-08	4.84E-08
Mercury	0.00026	2.46E-07	7.56E-09	3.31E-08
Nickel	0.0021	1.99E-06	6.11E-08	2.67E-07
Selenium	0.000024	2.28E-08	6.98E-10	3.06E-09
Total HAP	-	0.002	5.49E-05	2.40E-04

Notes:

[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4

[2] Global warming potential values are from the AR6 update, dated August 7, 2024

220-1

Anode cleaning & slot cutting#1 operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0220-1	Anode cleaning & slot cutting#1 operation	Al2O3, Na3AlF6, AlF3 PM	22108.57	0.005	0.948	4.150
	Anode cleaning & slot cutting#1 operation	Al2O3, Na3AlF6, AlF3 PM2.5	22108.57	0.0025	0.474	2.075
	Anode cleaning & slot cutting#1 operation	Al2O3, Na3AlF6, AlF3 PM10	22108.57	0.005	0.948	4.150

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

220-2

Anode cleaning & slot cutting#2 operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0220-2	Anode cleaning & slot cutting#2 operation	Al2O3, Na3AlF6, AlF3 PM	22108.57	0.005	0.948	4.150
	Anode cleaning & slot cutting#2 operation	Al2O3, Na3AlF6, AlF3 PM2.5	22108.57	0.0025	0.474	2.075
	Anode cleaning & slot cutting#2 operation	Al2O3, Na3AlF6, AlF3 PM10	22108.57	0.005	0.948	4.150

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

230-1
Baking fires and FTC operation ABF#1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
C, Al2O3 AlF3, Na3AlF6 PM	100.0%	99.0%
SO2	100.0%	0.0%
AlF3, Na3AlF6 PM	100.0%	99.8%
HF	100.0%	99.8%
C, Al2O3, AlF3, Na3AlF6 PM2.5	100.0%	98.7%
PAH	100.0%	93.5%
Condensed tar	100.0%	98.6%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant [1]	Emission Factor (lb/ton)	Emissions	
						lb/hr	tpy
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	C, Al2O3 AlF3, Na3AlF6 PM	0.070	1.79	7.84
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	SO2	3.24	82.88	363.02
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	TF [2]	0.02	0.51	2.24
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	HF [4]	0.008	0.20	0.90
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	C, Al2O3, AlF3, Na3AlF6 PM2.5	0.042	1.07	4.69
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	C, Al2O3 AlF3, Na3AlF6 PM10	0.042	1.08	4.74
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	PAH [3]	0.05	1.28	5.60
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	Condensed tar	0.007	0.19	0.83
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	CO	2.783	71.16	311.68
0230-1	Baking fires and FTC operation ABF#1	223,982	tn.Baked anode/year	NOx	1.098	28.08	122.98

Notes:

[1] Al Taweelah emission rate for all pollutants unless otherwise noted w/ 25% Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))

[2] TF emission factor is based on the NESHAP

[3] PAH emission factor is based on the NESHAP

[4] HF emission factor = TF factor * (treated HF factor / (treated HF + treated PMF))

Pollutant	Emission Factor [1]		Emissions	
	(lb/10^6 scf)	(lb/MMBtu)	lb/hr	tpy
CO2	120000	113.768	85.501	374.495
N2O	2.2	0.002	0.002	0.007
CH4	2.3	0.002	0.002	0.007
CO2e [2]	-	114.396	85.973	376.563

Notes:

[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-2

[2] Global warming potential values are from the AR6 update, dated August 7, 2024

230-2
Baking fires and FTC operation ABF#2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
C, Al2O3 AlF3, Na3AlF6 PM	100.0%	99.0%
SO2	100.0%	0.0%
AlF3, Na3AlF6 PM	100.0%	99.8%
HF	100.0%	99.8%
C, Al2O3, AlF3, Na3AlF6 PM2.5	100.0%	98.7%
PAH	100.0%	93.5%
Condensed tar	100.0%	98.6%
CO	100.0%	0.0%
NOx	100.0%	0.0%

Emission Calculations

Source ID	Source Description	Capacity/ Throughput	Unit	Pollutant [1]	Emission Factor (lb/ton)	Emissions	
						lb/hr	tpy
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	C, Al2O3 AlF3, Na3AlF6 PM	0.07	1.79	7.84
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	SO2	3.24	82.88	363.02
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	TF [2]	0.02	0.51	2.24
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	HF [4]	0.008	0.20	0.90
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	C, Al2O3, AlF3, Na3AlF6 PM2.5	0.042	1.07	4.69
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	C, Al2O3 AlF3, Na3AlF6 PM10	0.042	1.08	4.74
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	PAH [3]	0.05	1.28	5.60
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	Condensed tar	0.007	0.19	0.83
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	CO	2.783	71.16	311.68
0230-2	Baking fires and FTC operation ABF#2	223,982	tn.Baked anode/year	NOx	1.098	28.08	122.98

Notes:

[1] Al Taweelah emission rate for all pollutants unless otherwise noted w/ 25% Safety Factor (t.pollutant/yr) = Emission rate (tn.pollutant/yr) + (Emission rate (tn.pollutant/yr) * Safety Factor (%))

[2] TF emission factor is based on the NESHAP

[3] PAH emission factor is based on the NESHAP

[4] HF emission factor = TF factor * (treated HF factor / (treated HF + treated PMF))

Pollutant	Emission Factor [1]		Emissions	
	(lb/10^6 scf)	(lb/MMBtu)	lb/hr	tpy
CO2	120000	113.768	85.501	374.495
N2O	2.2	0.002	0.002	0.007
CH4	2.3	0.002	0.002	0.007
CO2e [2]	-	114.396	85.973	376.563

Notes:

[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-2

[2] Global warming potential values are from the AR6 update, dated August 7, 2024

240-1
Butt cleaning operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-1	Butt cleaning operation	Al2O3, Na3AlF6, AlF3 PM	21476.89	0.005	0.920	4.032
	Butt cleaning operation	Al2O3, Na3AlF6, AlF3 PM2.5	21476.89	0.0025	0.460	2.016
	Butt cleaning operation	Al2O3, Na3AlF6, AlF3 PM10	21476.89	0.005	0.920	4.032

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

240-2

Butt pre-cleaning operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0240-2	Butt pre-cleaning operation	Al2O3, Na3AlF6, AlF3 PM	21476.89	0.005	0.920	4.032
	Butt pre-cleaning operation	Al2O3, Na3AlF6, AlF3 PM2.5	21476.89	0.0025	0.460	2.016
	Butt pre-cleaning operation	Al2O3, Na3AlF6, AlF3 PM10	21476.89	0.005	0.920	4.032

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

240-3
Butt shot blasting operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-3	Butt shot blasting operation	Al2O3, Na3AlF6, AlF3 PM	21476.89	0.003	0.552	2.419
	Butt shot blasting operation	Al2O3, Na3AlF6, AlF3 PM2.5	21476.89	0.003	0.552	2.419
	Butt shot blasting operation	Al2O3, Na3AlF6, AlF3 PM10	21476.89	0.003	0.552	2.419

Notes:
[1] No particle size adjustment
[2] Emission factor based on BACT limit for similar sources

240-4

Butt & thimble press operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-4	Butt & thimble press operation	Al2O3, Na3AlF6, AlF3 PM	15160.16	0.005	0.650	2.846
	Butt & thimble press operation	Al2O3, Na3AlF6, AlF3 PM2.5	15160.16	0.0025	0.325	1.423
	Butt & thimble press operation	Al2O3, Na3AlF6, AlF3 PM10	15160.16	0.005	0.650	2.846

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

240-5

Butt transfer car operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-5	Butt transfer car operation	Al2O3, Na3AlF6, AlF3 PM	21476.89	0.005	0.920	4.032
	Butt transfer car operation	Al2O3, Na3AlF6, AlF3 PM2.5	21476.89	0.0025	0.460	2.016
	Butt transfer car operation	Al2O3, Na3AlF6, AlF3 PM10	21476.89	0.005	0.920	4.032

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

240-6

Cast iron recycling operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-6	Cast iron recycling operation	Al2O3, Na3AlF6, AlF3 PM	15160.16	0.005	0.650	2.846
	Cast iron recycling operation	Al2O3, Na3AlF6, AlF3 PM2.5	15160.16	0.0025	0.325	1.423
	Cast iron recycling operation	Al2O3, Na3AlF6, AlF3 PM10	15160.16	0.005	0.650	2.846

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

240-7

Cast iron melting Induction furnace operation

Pollutant	Control Device Capture	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-7	Cast iron melting Induction furnace operation	Al2O3, Na3AlF6, AlF3 PM	7580.08	0.005	0.325	1.423
	Cast iron melting Induction furnace operation	Al2O3, Na3AlF6, AlF3 PM2.5	7580.08	0.0025	0.162	0.711
	Cast iron melting Induction furnace operation	Al2O3, Na3AlF6, AlF3 PM10	7580.08	0.005	0.325	1.423

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

240-8

Stem brushing operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-8	Stem brushing operation	Al2O3, Na3AlF6, AlF3 PM	1895.02	0.005	0.081	0.356
	Stem brushing operation	Al2O3, Na3AlF6, AlF3 PM2.5	1895.02	0.0025	0.041	0.178
	Stem brushing operation	Al2O3, Na3AlF6, AlF3 PM10	1895.02	0.005	0.081	0.356

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

240-9
Stub shot blasting operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0240-9	Stub shot blasting operation	Al2O3, Na3AlF6, AlF3 PM	21476.89	0.003	0.552	2.419
	Stub shot blasting operation	Al2O3, Na3AlF6, AlF3 PM2.5	21476.89	0.003	0.552	2.419
	Stub shot blasting operation	Al2O3, Na3AlF6, AlF3 PM10	21476.89	0.003	0.552	2.419

Notes:
[1] No particle size adjustment
[2] Emission factor based on BACT limit for similar sources

241-10
Stub Hole Pre-Heating Station

Input	Value	Units	Notes
Operating Hours	8760	hours	
Heat Capacity	10	MMBtu/hr	[1]
NG Usage	254,758.32	scf/year	[2]

[1] Estimated heat capacity.

[2] Estimated natural gas usage based on projected facility-wide usage and estimate of usage distribution.

Pollutant	Emission Factor		Emissions	
	(lb/10^6 scf)	(lb/MMBtu)	lb/hr	tpy
PM	7.6	0.007	2.21E-04	9.68E-04
PM10	7.6	0.007	2.21E-04	9.68E-04
PM2.5	7.6	0.007	2.21E-04	9.68E-04
NOX	84	0.080	2.45E-03	1.07E-02
CO	86	0.082	2.50E-03	1.10E-02
SO2	0.6	0.001	1.74E-05	7.64E-05
Lead	0.0005	0.000	1.454E-08	6.369E-08
VOC	5.5	0.005	1.60E-04	7.01E-04
CO2	120000	113.768	3.490	15.285
N2O	2.2	0.002	6.40E-05	2.80E-04
CH4	2.3	0.002	6.69E-05	2.93E-04
CO2e	-	114.396	3.509	15.370
Benzene	0.0021	1.99E-06	6.11E-08	2.67E-07
Dichlorobenzene	0.0012	1.14E-06	3.49E-08	1.53E-07
Formaldehyde	0.075	7.11E-05	2.18E-06	9.55E-06
Hexane	1.8	1.71E-03	5.23E-05	2.29E-04
Naphthalene	0.00061	5.78E-07	1.77E-08	7.77E-08
Polycyclic Organic Matter	0.0000882	8.36E-08	2.57E-09	1.12E-08
Toluene	0.0034	3.22E-06	9.89E-08	4.33E-07
Arsenic	0.0002	1.90E-07	5.82E-09	2.55E-08
Beryllium	0.000012	1.14E-08	3.49E-10	1.53E-09
Cadmium	0.0011	1.04E-06	3.20E-08	1.40E-07
Chromium	0.0014	1.33E-06	4.07E-08	1.78E-07
Cobalt	0.000084	7.96E-08	2.44E-09	1.07E-08
Manganese	0.00038	3.60E-07	1.11E-08	4.84E-08
Mercury	0.00026	2.46E-07	7.56E-09	3.31E-08
Nickel	0.0021	1.99E-06	6.11E-08	2.67E-07
Selenium	0.000024	2.28E-08	6.98E-10	3.06E-09
Total HAP	-	0.002	5.49E-05	2.40E-04

Notes:

[1] Emission factors for natural gas combustion from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4

[2] Global warming potential values are from the AR6 update, dated August 7, 2024

250-1
Bath handling & storage

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0250-1	Bath handling & storage	Al2O3, Na3AlF6, AlF3 PM	21476.89	0.005	0.920	4.032
	Bath handling & storage	Al2O3, Na3AlF6, AlF3 PM2.5	21476.89	0.0025	0.460	2.016
	Bath handling & storage	Al2O3, Na3AlF6, AlF3 PM10	21476.89	0.005	0.920	4.032

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

250-2

Bath processing facility operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0250-2	Bath processing facility operation	Al2O3, Na3AlF6, AlF3 PM	47375.50	0.005	2.030	8.893
	Bath processing facility operation	Al2O3, Na3AlF6, AlF3 PM2.5	47375.50	0.0025	1.015	4.447
	Bath processing facility operation	Al2O3, Na3AlF6, AlF3 PM10	47375.50	0.005	2.030	8.893

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

250-3
Cavity bath handling

Pollutant	Control Device Capture	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0250-3	Cavity bath handling	Al2O3, Na3AlF6, AlF3 PM	21476.89	0.005	0.920	4.032
	Cavity bath handling	Al2O3, Na3AlF6, AlF3 PM2.5	21476.89	0.0025	0.460	2.016
	Cavity bath handling	Al2O3, Na3AlF6, AlF3 PM10	21476.89	0.005	0.920	4.032

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

250-4
Pure Bath Silo

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
				lb/hr	tpy
250-4	C, Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	C, Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	C, Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

260-1

Butts crushing operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0260-1	Butts crushing operation	Al2O3, Na3AlF6, AlF3 PM	9348.77	0.005	0.401	1.755
	Butts crushing operation	Al2O3, Na3AlF6, AlF3 PM2.5	9348.77	0.0025	0.200	0.877
	Butts crushing operation	Al2O3, Na3AlF6, AlF3 PM10	9348.77	0.005	0.401	1.755

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

260-2
Carbon recycled material storage

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	100.0%	99.0%
PM10	100.0%	99.0%
PM2.5	100.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0260-2	Carbon recycled material storage	Al2O3, Na3AlF6, AlF3 PM	1212.81	0.005	0.052	0.228
	Carbon recycled material storage	Al2O3, Na3AlF6, AlF3 PM2.5	1212.81	0.0025	0.026	0.114
	Carbon recycled material storage	Al2O3, Na3AlF6, AlF3 PM10	1212.81	0.005	0.052	0.228

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

EU_05 Mat. Hand. and Storage
Raw material or byproduct handling operations

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
810-1	Alumina storage#1	0.00	0.00	0.00	0.00	0.08	0.37	0.07	0.31	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
810-2	Alumina storage#2	0.00	0.00	0.00	0.00	0.08	0.37	0.07	0.31	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
820-1	AlF3 handling and storage	0.00	0.00	0.00	0.00	0.09	0.39	0.08	0.33	0.03	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
830-1	CPC storage#1	0.00	0.00	0.00	0.00	0.02	0.11	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
830-2	CPC storage#2	0.00	0.00	0.00	0.00	0.02	0.11	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
830-3	Coke Buffer Silo	0.00	0.00	0.00	0.00	0.11	0.49	0.05	0.23	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-1	Vacuum barge unloader operation	0.00	0.00	0.00	0.00	7.34	32.16	6.24	27.34	2.20	9.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-2	Vacuum barge unloader operation	0.00	0.00	0.00	0.00	2.11	9.22	0.74	3.23	0.11	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-3	Raw material handling operation	0.00	0.00	0.00	0.00	0.34	1.47	0.29	1.25	0.10	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-4	Raw material handling operation	0.00	0.00	0.00	0.00	0.10	0.42	0.03	0.15	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**	**10.30**	**45.10**	**7.58**	**33.22**	**2.51**	**10.98**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Potential Controlled + Allowable Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
810-1	Alumina storage#1	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
810-2	Alumina storage#2	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
820-1	AlF3 handling and storage	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
830-1	CPC storage#1	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
830-2	CPC storage#2	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
830-3	Coke Buffer Silo	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-1	Vacuum barge unloader operation	0.00	0.00	0.00	0.00	0.68	2.96	0.68	2.96	0.34	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-2	Vacuum barge unloader operation	0.00	0.00	0.00	0.00	0.68	2.96	0.68	2.96	0.34	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-3	Raw material handling operation	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900-4	Raw material handling operation	0.00	0.00	0.00	0.00	0.11	0.47	0.11	0.47	0.05	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**	**2.22**	**9.72**	**2.22**	**9.72**	**1.11**	**4.86**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

810-1

Alumina storage#1

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0810-1	Alumina storage#1	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	Alumina storage#1	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	Alumina storage#1	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

810-2
Alumina storage#2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0810-2	Alumina storage#2	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	Alumina storage#2	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	Alumina storage#2	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

820-1

AlF3 handling and storage

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0820-1	AlF3 handling and storage	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	AlF3 handling and storage	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	AlF3 handling and storage	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

830-1
CPC storage#1

Pollutant	Control Device Capture	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	**Source Description**	**Pollutant [1]**	**Flow Rate (dscfm)**	**Emission Factor (gr/dscf) [2]**	**Emissions**	
					lb/hr	**tpy**
0830-1	CPC storage#1	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	CPC storage#1	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	CPC storage#1	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

830-2
CPC storage#2

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0830-2	CPC storage#2	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	CPC storage#2	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	CPC storage#2	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

830-3

Coke Buffer Silo

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
830-3	Coke Buffer Silo	TSP	2526.69	0.005	0.108	0.474
	Coke Buffer Silo	PM2.5	2526.69	0.0025	0.054	0.237
	Coke Buffer Silo	PM10	2526.69	0.005	0.108	0.474

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

900-1
Vacuum barge unloader operation

Pollutant	Control Device Capture	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0900-1	Vacuum barge unloader operation	Al2O3, Na3AlF6, AlF3 PM	15791.83	0.005	0.677	2.964
	Vacuum barge unloader operation	Al2O3, Na3AlF6, AlF3 PM2.5	15791.83	0.0025	0.338	1.482
	Vacuum barge unloader operation	Al2O3, Na3AlF6, AlF3 PM10	15791.83	0.005	0.677	2.964

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

900-2

Vacuum barge unloader operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0900-2	Vacuum barge unloader operation	Al2O3, Na3AlF6, AlF3 PM	15791.83	0.005	0.677	2.964
	Vacuum barge unloader operation	Al2O3, Na3AlF6, AlF3 PM2.5	15791.83	0.0025	0.338	1.482
	Vacuum barge unloader operation	Al2O3, Na3AlF6, AlF3 PM10	15791.83	0.005	0.677	2.964

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

900-3

Raw material handling operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0900-3	Raw material handling operation	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	Raw material handling operation	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	Raw material handling operation	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:

[1] PM=PM10 and PM2.5 is 50% of PM

[2] Emission factor based on BACT limit for similar sources

900-4
Raw material handling operation

Pollutant	Control Device Capture Efficiency	Emissions Control Efficiency
PM	90.0%	99.0%
PM10	90.0%	99.0%
PM2.5	90.0%	99.0%

Emission Calculations

Source ID	Source Description	Pollutant [1]	Flow Rate (dscfm)	Emission Factor (gr/dscf) [2]	Emissions	
					lb/hr	tpy
0900-4	Raw material handling operation	Al2O3, Na3AlF6, AlF3 PM	2526.69	0.005	0.108	0.474
	Raw material handling operation	Al2O3, Na3AlF6, AlF3 PM2.5	2526.69	0.0025	0.054	0.237
	Raw material handling operation	Al2O3, Na3AlF6, AlF3 PM10	2526.69	0.005	0.108	0.474

Notes:
[1] PM=PM10 and PM2.5 is 50% of PM
[2] Emission factor based on BACT limit for similar sources

EU_06 Paved Roadways
Transport of goods and materials by vehicles

Uncontrolled Emissions		**CO**		**NOx**		**PM**		**PM10**		**PM2.5**		**SO2**		**VOC**		**CO2**		**CO2e**
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
120	Paved Roads	0.00	0.00	0.00	0.00	153.68	673.14	30.20	132.26	4.32	18.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**	**153.68**	**673.14**	**30.20**	**132.26**	**4.32**	**18.94**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Potential Controlled + Allowable Emission		**CO**		**NOx**		**PM**		**PM10**		**PM2.5**		**SO2**		**VOC**		**CO2**		**CO2e**
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
120	Paved Roads	0.00	0.00	0.00	0.00	23.05	100.97	4.53	19.84	1.11	4.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**	**23.05**	**100.97**	**4.53**	**19.84**	**1.11**	**4.87**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

120
Paved Roads
Pollutants - PM, PM2.5, PM10
Fugitive Emissions from paved roads
Raw Material Transport Vehicles, Intermediate Material Transport Vehicles, Final Product Transport Vehicles, Personal Vehicles

Operating Parameters	**Value**	**Units**	**Basis**
Annual Potential Vehicle Miles Traveled on paved roads	711582.10	VMT/yr	
Mean vehicle weight (W)	26.04	tons	
TSP k factor	0.011	lb/VMT	AP-42, Table 13.2.1-1
PM2.5 k factor	5.40E-04	lb/VMT	AP-42, Table 13.2.1-1
PM 10k factor	2.20E-03	lb/VMT	AP-42, Table 13.2.1-1
Silt Loading factor (sL)	9.7	g/m2	AP-42, Table 13.2.1-3
No. of days with > 0.01in percipitation (P)	90	-	AP-42, Figure 13.2.1-2
No. Days in avg. period (N)	365	-	-
Control Device	& Water Flushing	-	
Control Efficiency	85%	%	

Emissions Calculations

Pollutant	**Emission Factor [1]**	**Emission Factor [2]**	**Uncontrolled Emissions Rate [3]**		**Controlled Emissions Rate [4]**	
	(lb/VMT)	(lb/VMT)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
TSP	2.443	2.293	153.68	673.14	23.05	100.97
PM2.5	0.489	0.459	30.20	132.26	4.53	19.84
PM10	0.120	0.113	4.32	18.94	1.11	4.87

Notes:
[1] Emission Factor found using AP-42 Chap 13.2.1 "Paved Roads" Eq. (1)
EF = (k) * (sL^0.91) * (W^1.02)
k = particle size factor (lb/VMT)
sL = silt loading (g/m2)
W = Avg vehichle weight (tons)

[2] Adjusted Emission Factor accounts for precipitation and found using AP-42 Chap 13.2.1 "Paved Roads" Eq. (2)
Eadj = (EF) * (1-(P/4N))
P = No. of days w/ _> 0.01 in of precipitation
N = No. Days in avg. period (eg. 365 for annual)

[3]
Annual (tpy) = (Eadj) * (VMT) / (2000lb/ton)

Vehicle Type	Loaded Weight (tons)	Unloaded Weight (tons)	Loaded Trips/day (#)	Unloaded Trips/day (#)	Loaded Dist. (mi)	Unloaded Dist. (mi)
Anode Pallette Transport Vehicle	35.27	31.64	82	82	1.22	1.22
Bath Tapping Vehicle	28.66	20.94	8	8	0.9	0.9
Metal Transport Vehicle	60.63	45.19	74	74	0.83	0.83
Tap Hole Breaking Vehicle	8.05	N/A	2	0	2.28	0
AlF3 Vehicle	28.74	15.27	14	14	0.78	0.78
Hauling Tractors for trailers and tankers [2]	55.78	9.48	35	35	4.14	4.14
Forklift - 3-5T [2]	14.88	9.37	45.9	25.5	4.14	4.14
Forklift - 50T [2]	126.77	71.65	5.1	25.5	4.14	4.14
Payloader [1] [3]	18	14	12	12	0.63	0.63
Carbon Front End Loader [1] [3]	27	21	10	10	0.63	0.63
Insulated Manlift [1] [3]	20	20	12	0	2.28	0
Bath Tanker [1] [3]	25	17	8	8	0.59	0.59
CPC Tanker [1] [3]	38	16.5	3	3	0.76	0.76
Insulated Pitch Tanker [1] [3]	38	14.1	3	3	1.01	1.01
Alumina Tanker [1] [3]	30	10	3	3	1.14	1.14
15.5 tonne Metal Crucible tilter [1] [4]	22.05	11.05	74	74	0.83	0.83

[1] Weight estimates based on internet searches and other vehicle types.
[2] EGA indicated all segments could be traveled on but not likely to travel over all potential paths per trip, therefore travel distance is factored down by 50%.
[3] Number of trips estimated by ERM
[4] Number of trips set equal to the Metal Transport Vehicle

PM Emission Calculations			Uncontrolled		Controlled, Loaded		Controlled, Unloaded		Controlled, Combined	
Vehicle Type	Loaded PM E.F. (lb/VMT)	Unloaded PM E.F. (lb/VMT)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Anode Pallette Transport Vehicle	3.29	2.95	24.32	106.50	1.92	8.43	1.72	7.55	3.65	15.98
Bath Tapping Vehicle	2.67	1.94	1.30	5.67	0.11	0.49	0.08	0.36	0.19	0.85
Metal Transport Vehicle	5.72	4.24	23.79	104.18	2.05	8.98	1.52	6.65	3.57	15.63
Tap Hole Breaking Vehicle	0.73		0.13	0.57	0.02	0.09	0.00	0.00	0.02	0.09
AlF3 Vehicle	2.67	1.40	1.73	7.57	0.17	0.75	0.09	0.39	0.26	1.14
Hauling Tractors for trailers and tankers [2]	5.26	0.86	34.63	151.67	4.46	19.54	0.73	3.21	5.19	22.75
Forklift - 3-5T [2]	1.37	0.85	13.65	59.78	1.52	6.66	0.53	2.31	2.05	8.97
Forklift - 50T [2]	12.15	6.79	37.99	166.42	1.50	6.58	4.20	18.38	5.70	24.96
Payloader [1] [3]	1.66	1.28	0.87	3.81	0.07	0.32	0.06	0.25	0.13	0.57
Carbon Front End Loader [1] [3]	2.51	1.94	1.10	4.80	0.09	0.41	0.07	0.31	0.16	0.72
Insulated Manlift [1] [3]	1.85		1.98	8.65	0.30	1.30	0.00	0.00	0.30	1.30
Bath Tanker [1] [3]	2.32	1.56	0.72	3.14	0.06	0.28	0.04	0.19	0.11	0.47
CPC Tanker [1] [3]	3.55	1.52	0.45	1.98	0.05	0.21	0.02	0.09	0.07	0.30
Insulated Pitch Tanker [1] [3]	3.55	1.29	0.57	2.52	0.06	0.28	0.02	0.10	0.09	0.38
Alumina Tanker [1] [3]	2.79	0.91	0.49	2.16	0.06	0.24	0.02	0.08	0.07	0.32
15.5 tonne Metal Crucible tilter [1] [4]	2.04	1.01	7.28	31.87	0.73	3.20	0.36	1.58	1.09	4.78
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	153.68	673.14	13.59	59.52	9.46	41.45	23.05	100.97

PM10 Emission Calculations			Uncontrolled		Controlled, Loaded		Controlled, Unloaded		Controlled, Combined	
Vehicle Type	Loaded PM E.F. (lb/VMT)	Unloaded PM E.F. (lb/VMT)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Anode Pallette Transport Vehicle	0.66	0.59	4.86	21.30	0.38	1.69	0.34	1.51	0.73	3.20
Bath Tapping Vehicle	0.53	0.39	0.26	1.13	0.02	0.10	0.02	0.07	0.04	0.17
Metal Transport Vehicle	1.14	0.85	4.76	20.84	0.41	1.80	0.30	1.33	0.71	3.13
Tap Hole Breaking Vehicle	0.15		0.03	0.11	0.00	0.02	0.00	0.00	0.00	0.02
AlF3 Vehicle	0.53	0.28	0.35	1.51	0.03	0.15	0.02	0.08	0.05	0.23
Hauling Tractors for trailers and tankers [2]	1.05	0.17	6.93	30.33	0.89	3.91	0.15	0.64	1.04	4.55
Forklift - 3-5T [2]	0.27	0.17	2.73	11.96	0.30	1.33	0.11	0.46	0.41	1.79
Forklift - 50T [2]	2.43	1.36	7.60	33.28	0.30	1.32	0.84	3.68	1.14	4.99
Payloader [1] [3]	0.33	0.26	0.17	0.76	0.01	0.06	0.01	0.05	0.03	0.11
Carbon Front End Loader [1] [3]	0.50	0.39	0.22	0.96	0.02	0.08	0.01	0.06	0.03	0.14
Insulated Manlift [1] [3]	0.37		0.40	1.73	0.06	0.26	0.00	0.00	0.06	0.26
Bath Tanker [1] [3]	0.46	0.31	0.14	0.63	0.01	0.06	0.01	0.04	0.02	0.09
CPC Tanker [1] [3]	0.71	0.30	0.09	0.40	0.01	0.04	0.00	0.02	0.01	0.06
Insulated Pitch Tanker [1] [3]	0.71	0.26	0.11	0.50	0.01	0.06	0.00	0.02	0.02	0.08
Alumina Tanker [1] [3]	0.56	0.18	0.10	0.43	0.01	0.05	0.00	0.02	0.01	0.06
15.5 tonne Metal Crucible tilter [1] [4]	0.41	0.20	1.46	6.37	0.15	0.64	0.07	0.32	0.22	0.96
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	30.20	132.26	2.64	11.55	1.89	8.29	4.53	19.84

PM2.5 Emission Calculations			Uncontrolled		Controlled, Loaded		Controlled, Unloaded		Controlled, Combined	
Vehicle Type	Loaded PM E.F. (lb/VMT)	Unloaded PM E.F. (lb/VMT)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Anode Pallette Transport Vehicle	0.16	0.14	0.63	2.77	0.09	0.41	0.08	0.37	0.18	0.78
Bath Tapping Vehicle	0.13	0.10	0.04	0.16	0.01	0.02	0.00	0.02	0.01	0.04
Metal Transport Vehicle	0.28	0.21	0.67	2.94	0.10	0.44	0.07	0.33	0.18	0.77
Tap Hole Breaking Vehicle	0.04		0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00
AlF3 Vehicle	0.13	0.07	0.06	0.24	0.01	0.04	0.00	0.02	0.01	0.06
Hauling Tractors for trailers and tankers [2]	0.26	0.04	1.46	6.40	0.22	0.96	0.04	0.16	0.25	1.12
Forklift - 3-5T [2]	0.07	0.04	0.50	2.18	0.07	0.33	0.03	0.11	0.10	0.44
Forklift - 50T [2]	0.60	0.33	0.50	2.17	0.07	0.32	0.21	0.90	0.28	1.23
Payloader [1] [3]	0.08	0.06	0.02	0.11	0.00	0.02	0.00	0.01	0.01	0.03
Carbon Front End Loader [1] [3]	0.12	0.10	0.03	0.13	0.00	0.02	0.00	0.02	0.01	0.04
Insulated Manlift [1] [3]	0.09		0.10	0.42	0.01	0.06	0.00	0.00	0.01	0.06
Bath Tanker [1] [3]	0.11	0.08	0.02	0.09	0.00	0.01	0.00	0.01	0.01	0.02
CPC Tanker [1] [3]	0.17	0.07	0.02	0.07	0.00	0.01	0.00	0.00	0.00	0.01
Insulated Pitch Tanker [1] [3]	0.17	0.06	0.02	0.09	0.00	0.01	0.00	0.00	0.00	0.02
Alumina Tanker [1] [3]	0.14	0.04	0.02	0.08	0.00	0.01	0.00	0.00	0.00	0.02
15.5 tonne Metal Crucible tilter [1] [4]	0.10	0.05	0.24	1.05	0.04	0.16	0.02	0.08	0.05	0.23
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	4.32	18.94	0.65	2.83	0.46	2.03	1.11	4.87

EU_07 Emergency Power
Emergency Generators

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
315-1	Compressor Substation Diesel Generator	15.43	3.86	28.22	7.05	0.88	0.22	0.88	0.22	0.88	0.22	5.50	1.37	28.22	7.05	1112.71	278.18	279.10
315-2	Generator	1.16	0.29	2.18	0.55	0.07	0.02	0.07	0.02	0.07	0.02	0.41	0.10	2.18	0.55	83.47	20.87	20.94
Total		**16.59**	**4.15**	**30.40**	**7.60**	**0.95**	**0.24**	**0.95**	**0.24**	**0.95**	**0.24**	**5.91**	**1.48**	**30.40**	**7.60**	**1196.18**	**299.05**	**300.04**

Potential Controlled + Allowable Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
315-1	Compressor Substation Diesel Generator	15.43	3.86	28.22	7.05	0.88	0.22	0.88	0.22	0.88	0.22	5.50	1.37	28.22	7.05	1112.71	278.18	279.10
315-2	Generator	1.16	0.29	2.18	0.55	0.07	0.02	0.07	0.02	0.07	0.02	0.41	0.10	2.18	0.55	83.47	20.87	20.94
Total		**16.59**	**4.15**	**30.40**	**7.60**	**0.95**	**0.24**	**0.95**	**0.24**	**0.95**	**0.24**	**5.91**	**1.48**	**30.40**	**7.60**	**1196.18**	**299.05**	**300.04**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.08**	**0.02**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.08**	**0.02**

315-1
Compressor Substation Diesel Generator
Pollutants - CO, NOx, SO2, VOC, GHG, PM/PM10/PM2.5, HAPs
AP-42 Chapter 3.4 "Large Stationary Diesel and All Stationary Dual-fuel Engines"
Assumed > 600hp engine

Operating Parameters	Value	Units	Basis
Fuel Type	Diesel	-	
Manufacturer		-	
Manufacture Date		-	
Model No.		-	
Rated Power	2682	hp	600hp
Rated Power	1999.97	kW	
Avg. heating value	19,300	Btu/lb	Footnote "e" of Table 3.4-1 of AP-42 Chapter 3.4 "Large Stationary Diesel and All Stationary Dual-fuel Engines"
Fuel Density	7.1	lb/gal	Footnote "e" of Table 3.4-1 of AP-42 Chapter 3.4 "Large Stationary Diesel and All Stationary Dual-fuel Engines"
Sulfur Content	0.0015%	-	15 ppm sulfur
Capacity	6.82	MMBtu/hr (input)	
Power Conversion	7000	Btu/hr-hp	Footnote "e" of Table 3.4-1 of AP-42 Chapter 3.4 "Large Stationary Diesel and All Stationary Dual-fuel Engines"
Hours of Operation	500	hr/yr	Assumed
Control Device	N/A	-	

Emissions Calculations

Criteria Pollutant Emissions Rate

Pollutant	Uncontrolled Emissions Factors [1]		Uncontrolled Emissions Rate	
	(lb/hp-hr)	(g/kW-hr)	(lb/hr)	(tpy)
PM	3.29E-04	0.2	0.88	0.22
PM2.5	3.29E-04	0.2	0.88	0.22
PM10	3.29E-04	0.2	0.88	0.22
VOC	1.05E-02	6.4	28.22	7.05
CO	5.75E-03	3.5	15.43	3.86
NOx	1.05E-02	6.4	28.22	7.05
SO2	2.05E-03	1.25	5.50	1.37

Notes:

[1] Emission Factors from Table 3.3-1 of AP-42 Chapter 3.3 "Gasoline and Diesel Industrial Engines" and 40 CFR Part 1039Appendix I

Assumed PM = PM2.5 = PM10

Assumed SO2 = SOx

Speciated HAP Emissions Rate

Pollutant	Emission Factor [2]	Uncontrolled Emissions Rate	
	(lb/hp-hr)	(lb/hr)	(tpy)
Benzene	6.53E-06	1.75E-02	4.38E-03
Toluene	2.86E-06	7.68E-03	1.92E-03
Xylenes	2.00E-06	5.35E-03	1.34E-03
1,3-Butadiene	2.74E-07	7.34E-04	1.84E-04
Formaldehyde	8.26E-06	2.22E-02	5.54E-03
Acetaldehyde	5.37E-06	1.44E-02	3.60E-03
Acrolein	6.48E-07	1.74E-03	4.34E-04
Naphthalene	5.94E-07	1.59E-03	3.98E-04
Total HAP	2.65E-05	7.12E-02	1.78E-02

Notes:

[2] Emission Factors from Table 3.3-2. Convert from MMBtu to hp-hr (* 7000 Btu/hp-hr / 1,000,000 Btu/MMBtu).

Assumed combustion emissions from engine are uncontrolled

GHG Pollutant Emissions Rate

Pollutant	Emission Factor (EF) [3]	Global Warming Potential [4]	Uncontrolled Emissions Rate		GHG GWP
	(kg/MMBtu)	(GWP)	(lb/hr)	(tpy)	(ton CO2e/yr)
CO2	73.96	1	1112.7	278.2	278.2
CH4	3.00E-03	27	0.0	0.0	0.3
N2O	6.00E-04	273	0.0	0.0	0.6
Total GHG (ton CO2e/yr)					**279.10**

Notes:

[3] Table C-1 and C-2 of 40 CFR 98 Subpart C (assumed fuel No. 2)

[4] Global warming potential values are from the AR6 update, dated August 7, 2024

CO2e = CO2 Emissions + CH4 Emissions * GWP of CH4 + N2O Emissions * GWP of N2O

Assumed combustion emissions from engine are uncontrolled

315-2
Small Size Diesel Generator
Pollutants - CO, NOx, SO2, VOC, GHG, PM/PM10/PM2.5, HAPs
AP-42 Chapter 3.3 "Gasoline and Diesel Industrial Engines"
Assumed < 600hp

Operating Parameters	Value	Units	Basis
Fuel Type	Diesel	-	
Manufacturer		-	
Manufacture Date		-	
Model No.		-	
Rated Power	201.2	hp	assumed < 600hp
Rated Power	150.03	kW	
Avg. heating value	19,300	Btu/lb	Footnote "c" of Table 3.3-1 of AP-42 Chapter 3.3 "Gasoline and Diesel Industrial
Fuel Density	7.1	lb/gal	assumed
Sulfur Content	0.0015%	-	15 ppm sulfur
Rated Heat Input Capacity	0.51	MMBtu/hr (input)	
Power Conversion	7000	Btu/hr-hp	Footnote "a" of Table 3.3-1 of AP-42 Chapter 3.3 "Gasoline and Diesel Industrial
Hours of Operation	500	hr/yr	assumed
Control Device	N/A	-	
No. of like Gens	1		

Emissions Calculations

Criteria Pollutant Emissions Rate

Pollutant	Uncontrolled Emissions Factors [1]		Uncontrolled Emissions Rate	
	(lb/hp-hr)	(lb/mmbtu)	(lb/hr)	(tpy)
PM	3.29E-04	0.2	0.07	0.02
PM2.5	3.29E-04	0.2	0.07	0.02
PM10	3.29E-04	0.2	0.07	0.02
VOC	1.09E-02	6.6	2.18	0.55
CO	5.75E-03	3.5	1.16	0.29
NOx	1.09E-02	6.6	2.18	0.55
SO2	2.05E-03	1.25	0.41	0.10

Notes:

[1] Emission Factors from Table 3.3-1 of AP-42 Chapter 3.3 "Gasoline and Diesel Industrial Engines" and 40 CFR Part 1039Appendix I
Assumed PM = PM2.5 = PM10
Assumed SO2 = SOx

Speciated HAP Emissions Rate

Pollutant	Emission Factor [2]	Uncontrolled Emissions Rate	
	(lb/mmbtu)	(lb/hr)	(tpy)
Benzene	6.53E-06	1.31E-03	3.29E-04
Toluene	2.86E-06	5.76E-04	1.44E-04
Xylenes	2.00E-06	4.01E-04	1.00E-04
1,3-Butadiene	2.74E-07	5.51E-05	1.38E-05
Formaldehyde	8.26E-06	1.66E-03	4.15E-04
Acetaldehyde	5.37E-06	1.08E-03	2.70E-04
Acrolein	6.48E-07	1.30E-04	3.26E-05
Naphthalene	5.94E-07	1.19E-04	2.99E-05
Total HAP	2.65E-05	5.34E-03	1.33E-03

Notes:
[2] Emission Factors from Table 3.3-2 of AP-42 Chapter 3.3 "Gasoline and Diesel Industrial Engines"
Assumed combustion emissions from engine are uncontrolled

GHG Pollutant Emissions Rate

Pollutant	Emission Factor (EF) [3]	Global Warming Potential [4]	Uncontrolled Emissions Rate		GHG GWP
	(kg/MMBtu)	(GWP)	(lb/hr)	(tpy)	(ton CO2e/yr)
CO2	73.96	1	83.5	20.87	20.87
CH4	3.00E-03	27	0.003	8.5E-04	0.02
N2O	6.00E-04	273	0.001	1.7E-04	0.05
Total GHG (ton CO2e/yr)					**20.94**

Notes:
[3] Table C-1 and C-2 of 40 CFR 98 Subpart C (assumed fuel No. 2)
[4] Global warming potential values are from the AR6 update, dated August 7, 2024
CO2e = CO2 Emissions + CH4 Emissions * GWP of CH4 + N2O Emissions * GWP of N2O
Assumed combustion emissions from engine are uncontrolled

EU_08 Water-Cooling Systems
Cooling towers for heat dissipation

Uncontrolled Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
450	Casthouse Cooling Water and Treatment Towers	0.00	0.00	0.00	0.00	17.51	76.71	8.17	16.69	3.50E-02	3.07E-04	0.00	0.00	0.01	0.04	0.00	0.00	0.00
213	Green Anode Cooling Tower(s)	0.00	0.00	0.00	0.00	17.51	76.71	8.17	16.69	3.50E-02	3.07E-04	0.00	0.00	0.01	0.04	0.00	0.00	0.00
430-3	Mold Water Cooling Systems	0.00	0.00	0.00	0.00	17.51	76.71	8.17	16.69	3.50E-02	3.07E-04	0.00	0.00	0.01	0.04	0.00	0.00	0.00
241-13	Carbon area cooling tower system for induction furnace	0.00	0.00	0.00	0.00	17.51	76.71	8.17	16.69	3.50E-02	3.07E-04	0.00	0.00	0.01	0.04	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**	**70.06**	**306.85**	**32.67**	**66.75**	**1.40E-01**	**1.23E-03**	**0.00**	**0.00**	**0.04**	**0.18**	**0.00**	**0.00**	**0.00**

Potential Controlled + Allowable Emissions		CO		NOx		PM		PM10		PM2.5		SO2		VOC		CO2		CO2e
Source ID	**Description**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**tpy**
450	Casthouse Cooling Water and Treatment Towers	0.00	0.00	0.00	0.00	0.18	0.77	0.08	0.36	3.50E-04	1.53E-03	0.00	0.00	0.01	0.04	0.00	0.00	0.00
213	Green Anode Cooling Tower(s)	0.00	0.00	0.00	0.00	0.18	0.77	0.08	0.36	3.50E-04	1.53E-03	0.00	0.00	0.01	0.04	0.00	0.00	0.00
430-3	Mold Water Cooling Systems	0.00	0.00	0.00	0.00	0.18	0.77	0.08	0.36	3.50E-04	1.53E-03	0.00	0.00	0.01	0.04	0.00	0.00	0.00
241-13	Carbon area cooling tower system for induction furnace	0.00	0.00	0.00	0.00	0.18	0.77	0.08	0.36	3.50E-04	1.53E-03	0.00	0.00	0.01	0.04	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**	**0.70**	**3.07**	**0.33**	**1.43**	**1.40E-03**	**6.14E-03**	**0.00**	**0.00**	**0.04**	**0.18**	**0.00**	**0.00**	**0.00**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.09**

Total Flourides		Flouride PM		PAH		HCl		HAPs	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.09**

450

Casthouse Cooling Water and Treatment Towers

Pollutants - PM, PM2.5, PM10, VOC, HAPs

Operating Parameters	**Value**	**Units**	**Basis**
Drift Rate	0.001%		BACT
Recirculation Flow Rate	10000	gpm	Estimate
TDS (ppm)	3500	ppm	Estimate
PM to PM2.5 Ratio	0.2%		Reisman & Frisbie 2002
PM to PM10 Ratio	46.6%		
Control Device	Drift eliminator		BACT

PM10 and PM2.5 ratios calculated using the Reisman and Frisbie 2002 method.

Emissions Calculations

PM emissions =(Flow rate (gpm))*(TDS(ppm))/(1,000,000)*(drift rate %)*(60min/hr)*(8.34 lb/gal)

Pollutant	**Uncontrolled Emissions Rate** (lb/hr)	(tpy)
PM [1]	17.51	76.71
PM10 [1]	8.17	16.69
PM2.5 [1]	3.5E-02	3.1E-04
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[1] Uncontrolled emissions calculated using a 0.1% drift rate

[2] Conservatively estimated emissions due to unknowns in design

Pollutant	**Controlled Emissions Rate** (lb/hr)	(tpy)
PM	0.18	0.77
PM10	0.08	0.36
PM2.5	3.50E-04	0.00
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[2] Conservatively estimated emissions due to unknowns in design

213

Green Anode Cooling Tower(s)

Pollutants - PM, PM2.5, PM10, VOC, HAPs

Operating Parameters	Value	Units	Basis
Drift Rate	0.001%		BACT
Recirculation Flow Rate	10000	gpm	Estimate
TDS (ppm)	3500	ppm	Estimate
PM to PM2.5 Ratio	0.2%		Reisman & Frisbie 2002
PM to PM10 Ratio	46.6%		
Control Device	Drift eliminator		BACT

PM10 and PM2.5 ratios calculated using the Reisman and Frisbie 2002 method.

Emissions Calculations

PM emissions =(Flow rate (gpm))*(TDS(ppm))/(1,000,000)*(drift rate %)*(60min/hr)*(8.34 lb/gal)

Pollutant	Uncontrolled Emissions Rate	
	(lb/hr)	(tpy)
PM [1]	17.51	76.71
PM10 [1]	8.17	16.69
PM2.5 [1]	3.5E-02	3.1E-04
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[1] Uncontrolled emissions calculated using a 0.1% drift rate

[2] Conservatively estimated emissions due to unknowns in design

Pollutant	Controlled Emissions Rate	
	(lb/hr)	(tpy)
PM	0.18	0.77
PM10	0.08	0.36
PM2.5	3.50E-04	1.5E-03
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[2] Conservatively estimated emissions due to unknowns in design

430-3
Mold Water Cooling Systems
Pollutants - PM, PM2.5, PM10, VOC, HAPs

Operating Parameters	Value	Units	Basis
Drift Rate	0.001%		BACT
Recirculation Flow Rate	10000	gpm	Estimate
TDS (ppm)	3500	ppm	Estimate
PM to PM2.5 Ratio	0.2%		Reisman & Frisbie 2002
PM to PM10 Ratio	46.6%		
Control Device	Drift eliminator		BACT

PM10 and PM2.5 ratios calculated using the Reisman and Frisbie 2002 method.

Emissions Calculations
PM emissions =(Flow rate (gpm))*(TDS(ppm))/(1,000,000)*(drift rate %)*(60min/hr)*(8.34 lb/gal)

Pollutant	Uncontrolled Emissions Rate	
	(lb/hr)	(tpy)
PM [1]	17.51	76.71
PM10 [1]	8.17	16.69
PM2.5 [1]	3.5E-02	3.1E-04
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[1] Uncontrolled emissions calculated using a 0.1% drift rate
[2] Conservatively estimated emissions due to unknowns in design

Pollutant	Controlled Emissions Rate	
	(lb/hr)	(tpy)
PM	0.18	0.77
PM10	0.08	0.36
PM2.5	3.50E-04	1.5E-03
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[2] Conservatively estimated emissions due to unknowns in design

241-13

Carbon area cooling tower system for induction furnace

Pollutants - PM, PM2.5, PM10

Operating Parameters	**Value**	**Units**	**Basis**
Drift Rate	0.001%		BACT
Recirculation Flow Rate	10000	gpm	Estimate
TDS (ppm)	3500	ppm	Estimate
PM to PM2.5 Ratio	0.2%		Reisman & Frisbie 2002
PM to PM10 Ratio	46.6%		
Control Device	Drift eliminator		BACT

PM10 and PM2.5 ratios calculated using the Reisman and Frisbie 2002 method.

Emissions Calculations

PM emissions =(Flow rate (gpm))*(TDS(ppm))/(1,000,000)*(drift rate %)*(60min/hr)*(8.34 lb/gal)

Pollutant	**Uncontrolled Emissions Rate** (lb/hr)	(tpy)
PM [1]	17.51	76.71
PM10 [1]	8.17	16.69
PM2.5 [1]	3.5E-02	3.1E-04
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[1] Uncontrolled emissions calculated using a 0.1% drift rate

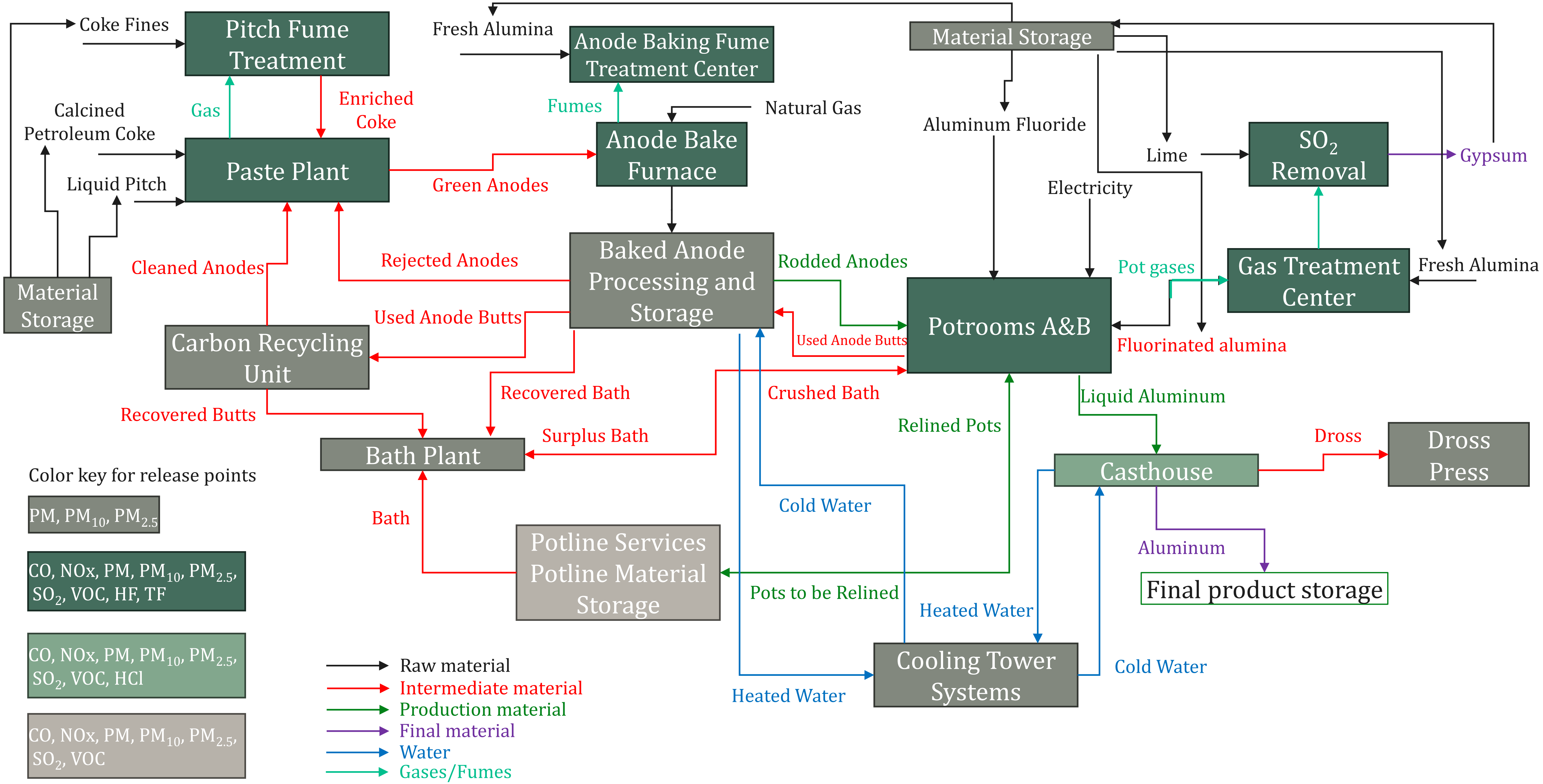
[2] Conservatively estimated emissions due to unknowns in design

Pollutant	**Controlled Emissions Rate** (lb/hr)	(tpy)
PM	0.18	0.77
PM10	0.08	0.36
PM2.5	3.50E-04	1.5E-03
VOC [2]	0.01	0.04
HAPs [2]	0.005	0.02

[2] Conservatively estimated emissions due to unknowns in design

ERM

APPENDIX C PROCESS FLOW DIAGRAM


Coke Fines
Pitch Fume Treatment
Fresh Alumina
Anode Baking Fume Treatment Center
Material Storage
Gas
Enriched Coke
Fumes
Natural Gas
Aluminum Fluoride
Calcined Petroleum Coke
Paste Plant
Anode Bake Furnace
Lime
SO$_2$ Removal
Gypsum
Liquid Pitch
Green Anodes
Electricity
Baked Anode Processing and Storage
Rodded Anodes
Pot gases
Gas Treatment Center
Fresh Alumina
Cleaned Anodes
Rejected Anodes
Material Storage
Used Anode Butts
Potrooms A&B
Used Anode Butts
Fluorinated alumina
Carbon Recycling Unit
Recovered Bath
Crushed Bath
Liquid Aluminum
Recovered Butts
Relined Pots
Surplus Bath
Dross
Dross Press
Bath Plant
Casthouse
Color key for release points
PM, PM$_{10}$, PM$_{2.5}$
Cold Water
Bath
Potline Services Potline Material Storage
Aluminum
CO, NOx, PM, PM$_{10}$, PM$_{2.5}$, SO$_2$, VOC, HF, TF
Pots to be Relined
Heated Water
Final product storage
CO, NOx, PM, PM$_{10}$, PM$_{2.5}$, SO$_2$, VOC, HCl
Raw material
Intermediate material
Cooling Tower Systems
Cold Water
Production material
Heated Water
CO, NOx, PM, PM$_{10}$, PM$_{2.5}$, SO$_2$, VOC
Final material
Water
Gases/Fumes

ERM

APPENDIX D BEST AVAILABLE CONTROL TECHNOLOGY

Appendix D – Best Available Control Technology Assessment

Oklahoma Aluminum: New Primary Aluminum Smelter

PREPARED FOR
OK Department of Environmental Quality

DATE
9 February 2026

REFERENCE
0793283

SIGNATURE PAGE

Appendix D – Best Available Control Technology Assessment

Oklahoma Aluminum: New Primary Aluminum Smelter

0793283

Jeffery H. Twaddle
Partner

Andrew Rengel
Managing Technical Consultant

Enviromental Resources Management, Inc.
75 Valley Streem Pkwy #200
Malvern, PA 19355

T +1 484 913 0300

CONTENTS

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

Acronym	Description
AP	Air Pollution or AP-42 (Compilation of Air Pollutant Emission Factors)
BACT	Best Available Control Technology
CCS	Carbon Capture and Sequestration
CFR	Code of Federal Regulations
CO	Carbon Monoxide
COS	Carbonyl Sulfide
DSI	Dry Sorbent Injection
EAF	Electric Arc Furnace
EPA	Environmental Protection Agency
ERM	Environmental Resources Management
ESP	Electrostatic Precipitator
FGD	Flue Gas Desulfurization
FGR	Flue Gas Recirculation
GHG	Greenhouse Gas
gr	grain
HDE	High Efficiency Drift Eliminator
HF	Hydrogen Fluoride
HP	Horsepower

Acronym	Description
LAER	Lowest Achievable Emission Rate
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSA	National Security Agency or facility name context
NSCR	Non-Selective Catalytic Reduction
NSPS	New Source Performance Standards
NSR	New Source Review
OAC	Oklahoma Administrative Code
OA	Oklahoma Aluminum
OK	Oklahoma
ODEQ	Oklahoma Department of Environmental Quality
OSC	Off-Stoichiometric Combustion
PAH	Polycyclic Aromatic Hydrocarbons
PM	Particulate Matter
PM_{10}	Particulate Matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$	Particulate Matter with an aerodynamic diameter less than 2.5 microns
PSD	Prevention of Significant Deterioration
PTM	Pot Tending Machine
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
RTO	Regenerative Thermal Oxidizer
SCR	Selective Catalytic Reduction
SDA	Spray Dryer Absorber
SNCR	Selective Non-Catalytic Reduction
TF	Total Fluorides
USEPA	United States Environmental Protection Agency
VE	Visible Emissions
VOC	Volatile Organic Compounds

1. INTRODUCTION

Oklahoma Aluminum (OA) is proposing to build a new aluminum smelting facility in Inola, OK. The property is a greenfield site and all OA processes and equipment will be new. All equipment and processes will be subject to BACT (Best Available Control Technology), in accordance with OAC 252:100-8-34, which requires that major stationary sources or modifications meet all applicable emissions limitations outlined in OAC 252:100. and the emission and performance standards under 40 CFR parts 60 and 61. Additionally, a new major source shall apply BACT for each regulated NSR (New Source Review) pollutant for which it would be a significant net emissions increase at the source. The new equipment and processes will be grouped as appropriate for review of applicable controls.

2. PROCESS DESCRIPTION

The process description in the main application text is applicable to the BACT, therefore, it will not be repeated. The Prevention of Significant Deterioration significant emissions rates have been triggered for the following BACT pollutants: CO, NOx, PM/PM_{10}/$PM_{2.5}$, SO_2, VOC, GHG, and TF.

3. BACT GUIDELINES

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, economic, energy, and environmental impacts and document results; and

Step 5: Select BACT.

Evaluation of technical feasibility includes evaluating existing controls for the specific source category but also evaluating technology transfer – controls applied to similar source categories and gas streams. The controls should not affect the reliable operation of the source equipment or affect the product quality. Economic feasibility evaluates the cost effectiveness of a control technology in terms of cost per ton of pollutant controlled relative to recent BACT determinations.

3.1 KEY STEPS IN A TOP-DOWN BACT ANALYSIS

The key steps in a top-down BACT analysis are outlined in the USEPA New Source Review Workshop Manual. The process follows these steps:

Step 1 – Available Control Options

The first step is to identify potentially "available" control options for each emission unit and for each pollutant under review. Available options should consist of a comprehensive list of those technologies with a potentially practical application to the emissions unit in question. The list should include Reasonably Available Control Technology (RACT), Best Available Control Technology, Lowest Achievable Emission Rate (LAER) technologies, innovative technologies, and controls applied to similar source categories.

For this analysis, the following sources were researched:

- USEPA's RACT/BACT/LAER Clearinghouse (RBLC) database;
- Federal and State Air Quality Permits;
- Guidance documents, such as AP-42, Volume 1, Fifth Edition; and
- Proposed and existing NSPS and NESHAP regulations.

Step 2 – 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 3 – 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 4 – 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.

Step 5 – Select BACT

The fifth and final step is to select as BACT the most effective of the remaining technologies under consideration for each pollutant of concern. BACT must, at a minimum, be no less stringent than the level of control required by any applicable NSPS and NESHAP or State regulatory standards applicable to the emission units included in the PSD permit application.

This BACT analysis provides background information on potential control technologies, a summary of technology determinations contained in the RBLC database for similar emission units, a discussion of other potential control options that may be applicable to the emission units, and proposed BACT emission limits.

3.2 RBLC SUMMARY

Summaries of RBLC listings for applicable for aluminum metal production facilities are included in Appendix A. The RBLC queries included the following processes:

- Process Type: 17.110 Large Internal Combustion Engines (>500 HP)
- Process Type: 17.210 Small Internal Combustion Engines (<500 HP)
- Process Type: 82.111 Primary Aluminum Furnaces & Pot Lines
- Process Type: 82.119 Miscellaneous Primary Aluminum Processes
- Process Type: 82.121-129 Secondary Aluminum Processes
- Process Type: 90.001 Alumina Processing
- Process Type: 90.019 Lime/Limestone Handling/Kilns/Storage/Manufacturing
- Process Type: 99.009 Industrial Process Cooling Towers
- Process Type: 99.140 Paved Roads
- Process Type: 99.190 Other Fugitive Dust Sources

When numerous results were found for a process type, emphasis was placed on selecting sources in the metals industry.

3.3 BACT DETERMINATION FOR PROJECT SOURCES

This section evaluates BACT for the following emission sources or source types associated with the project:

- Aluminum smelting potrooms A & B
- Potline services (potshell lining/delining, crucible cleaning, taping tube cleaning)
- Small natural gas-fired heaters/boilers (<100 MMBtu/hr)
- Casthouse services (crucible skimming, dross treatment)
- Solid material storage silos
- Liquid material storage tanks
- Paste mixing lines dry materials (dry aggregate crushing, milling, and classifiers)
- Paste Mixing – anode formation (pitch melting, paste mixing, and anode forming)
- Anode baking furnace
- Shot blasting operations
- Baked anode services (cleaning, slot cutting, loading/unloading, bath removal, butt removal, recycling, cast iron cleaning, rod brushing, and anode rodding)
- Raw material handling (suction pipe unloader, conveyor, truck loading/unloading, bucket elevator, bag breaker, gypsum processes)
- Paved roadways
- Emergency generators
- Cooling Towers

3.3.1 ALUMINUM SMELTING POTROOMS A & B

Molten aluminum metal (Al) is produced through the Hall-Héroult process, utilizing OA EX Pot Technology across 484 pots housed in two potroom buildings. Each potroom will contain 242 pots, split into two sections of 121 pots. The facility projects to produce 826,734 tons (750,000 metric tons) per year of liquid aluminum. Exhaust from each of the 484 pots are captured and ducted to one of two gas treatment centers to control emissions. These gas treatment centers are expected to capture 99% of the generated emissions from the pots, while the remaining 1% of emissions will vent through the potline buildings roof vents. During pot tending operations, the air flow rate from the potlines to the gas treatment centers is increased to minimize uncaptured emissions. Uncaptured emissions exhaust through a roof vent on top of the potline buildings. This analysis is focused on the captured emissions as add-on controls to the uncaptured emissions venting through the roof vent are technically infeasible.

3.3.1.1 PM/PM_{10}/$PM_{2.5}$ BACT

Emissions of PM/PM_{10}/$PM_{2.5}$ consist of alumina, fluorinated alumina, and sodium hexafluorinate. These products are recyclable, therefore their capture by control technology in the smelting process must ensure that the technology with the greatest control efficiency does not affect the quality of these products.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing PM/PM_{10}/$PM_{2.5}$ emissions are described below.

Fabric Filter

This type of particulate control technology utilizes filters to remove dry particles from gas streams. Baghouse filtration involves the use of 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. 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 can no longer be effectively cleaned.

Electrostatic Precipitator

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.

Venturi Scrubber

Venturi scrubbers accelerate the gas stream to atomize the scrubbing liquid and to improve gas-liquid contact. In a venturi scrubber, a "throat" section is built into the duct that forces the gas stream to accelerate as the duct narrows and then expands. As the gas stream enters the venturi throat, both gas velocity and turbulence increase. Depending on the scrubber design, the scrubbing liquid is sprayed into the gas stream before the gas encounters the venturi throat, or upwards against the gas flow in the throat. The scrubbing liquid is then atomized into small droplets by the turbulence in the throat and droplet-particle interaction is increased. Some designs use supplemental hydraulically or pneumatically atomized sprays to augment droplet creation. After the throat section, the mixture decelerates and further impacts occur causing the droplets to agglomerate. Once the particles have been captured by the liquid, the wetted PM and excess liquid droplets are separated from the gas stream by an entrainment section which usually consists of a cyclonic separator and/or mist eliminator.

Cyclone

Cyclones are particulate control devices that remove particulates by centrifugal and inertial forces, induced by forcing particulate-laden gas to change direction. Cyclones are used primarily for pretreatment control devices and are not considered a "best" available control technology. Therefore, the use of a cyclone as its own control technology will not be further evaluated.

Step 2 – Technical Feasibility of Control Technologies

The acid gases of HF and SO_2 can react with the grounded collection plates of an ESP, causing corrosion of the plates and other electrical components. Additionally, the particulate can be sticky or hygroscopic, which would favor a WESP. However, the WESP introduces water to control the particulates and to wash the charge plates, which impedes the ability to create fluorinated alumina, which is a useful product in the smelting process. Because of these reasons, an ESP is technically infeasible.

A venturi scrubber requires a high pressure drop to achieve capture of fine particulate, which would require a very high horsepower fan to achieve the necessary pressure drop due to the large exhaust flow from the potlines (nominally 5,566,000 Nm^3/hour). Additionally, the acid gases would dissolve in the scrubbing liquid, generating corrosive slurry, which would degrade the scrubber components quickly, requiring significant maintenance. Because of these reasons, venturi scrubbing is technically infeasible.

Baghouse filtration is the only technically feasible control, as the filter bag is nonreactive to the constituents of the potlines exhaust, which facilitates the recovery of the alumina, fluorinated alumina, and sodium hexafluorinate.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Fabric Filter Baghouse – 90-99%

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA will be selecting the top-ranked control technology, use of fabric filtration, therefore no further evaluation is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of fabric filtration (baghouse) to achieve an emission factor of 4.88 lb PM/ton, 2.10 lb PM_{10}/ton, and 2.10 lb $PM_{2.5}$/ton of molten aluminum produced on each of the potlines. These are significantly lower than the 40 CFR Part 63 Subpart LL emission factor limit of 4.9 lb PM/ton. Good housekeeping practices will also be implemented to serve as BACT. The affected source IDs and numeric emission limits are presented in the table below. The fabric filtration baghouse is expected to capture 99% of the total emissions from the smelting pots. The remaining 1% of smelting pot emissions are expected to vent out of the potline building roof vents. Additional reductions in the proposed emission factors are for modeling purposes to demonstrate compliance with the NAAQS and PSD increment.

TABLE 1: POTROOMS A&B PM/PM_{10}/$PM_{2.5}$ NUMERIC EMISSION LIMITS

Source ID	Description	Emission Factor lb/ton		
		PM	PM_{10}	$PM_{2.5}$
321-1, 321-2, 322-1	Potroom A-1, B-1, vented through GTC 1 with FGD and roof vents	4.88	2.10	2.10
321-3, 321-4, 322-2	Potroom A-2, B-2, vented through GTC 2 with FGD and roof vents	4.88	2.10	2.10

3.3.1.2 NO_X BACT

Aluminum is produced from alumina in the pot as current is passed from a carbon anode to carbon blocks on the pot wall, which serve as the cathode. The anodes are made from calcined petroleum coke and pitch. NOx emissions are minimal since there is no external fuel and there are no large sources of nitrogen in the raw materials.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing NO_X emissions are described below.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR)- SCR is an add-on system for controlling NOx emissions. It works by injecting a nitrogen-based reagent (ammonia or urea) into the exhaust stream, which reacts with NOx over a catalyst to form nitrogen and water. SCR systems typically achieve 70–90% NOx reduction when operated within the appropriate temperature window (~480–800 °F). System components include reagent storage and dosing equipment, injection controls, and a catalyst bed. SCR does not control PM, CO, or hydrocarbons.

The reduction reaction between ammonia (NH_3) and nitrogen oxides (NO_x) in an SCR system is promoted in the presence of excess oxygen, typically greater than 1%. Under optimal operating conditions and depending on system design, NO_x reduction efficiencies in the range of 70% to 90% are achievable. Key technical considerations influencing SCR performance include catalyst reactor configuration, operating temperature window, sulfur content in the fuel, catalyst deactivation due to thermal aging or chemical poisoning, ammonia slip, and the design and control of the ammonia injection system.

Catalyst activity decreases significantly below the optimal temperature range, increasing the likelihood of unreacted ammonia (commonly referred to as "ammonia slip") being emitted to the atmosphere. Over time, SCR catalysts may experience deactivation from both physical degradation and chemical fouling. Manufacturers typically guarantee a catalyst operational life of approximately three years while maintaining compliance with specified NO_x emission limits.

Selective Non-Catalytic Reduction - SNCR

SNCR is a post-combustion technique that involves injecting ammonia or urea into specific temperature zones in the upper furnace or, in other cases, connective pass of a boiler or process heater to reduce both NO_x and CO emissions. A temperature of between 1,600°F and 2,100°F is required at the injection site for the process reaction to take place. The ammonia or urea reacts with NO_x in the gas to produce molecular nitrogen and water vapor. The NO_x reduction reaction is favored over other chemical reaction processes for a specific temperature range and in the presence of oxygen; therefore, it is considered a selective chemical process. SNCR is effective only in a stoichiometric or fuel-rich environment where combustion gas is nearly depleted of oxygen. controls NO_x emissions by injecting a nitrogen reducing agent, such as ammonia or urea, into the post combustion zone, reducing NO_x to molecular N_2 and water. The reduction reaction with NO_x is favored over chemical reaction processes at temperatures between 1,600 °F – 2,100 °F.

Non-Selective Catalytic Reduction - NSCR

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 NOx, 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, NOx 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, NOx removal rates of 80 to 90% are achievable.

Good Work Practices

Because the smelting pot is not a combustion source and doesn't have a burner, good work practices center around the amount and distribution of excess air in the combustion zone to ensure complete combustion. The excess air temperature is also maintained such that it doesn't lead to high temperatures, which leads to NO_x formation.

Step 2 – Eliminate Technically Infeasible Options

The concentration of NOx in the potroom reactor exhaust is extremely low because there are no external fuels combusted and there are no large sources of nitrogen in the raw materials. Traditional methods of preventing NOx formation using staged combustion or low NOx burners are not applicable to the potlines.

NSCR requires precise adjustments of process conditions such as oxygen content and temperature, and works best with certain windows of inlet concentration for NOx, CO, and VOC. These operating windows are necessary because the catalyst was developed to react the NOx, 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 oxygen content expected in the exhausts from the aluminum smelters makes NSCR ineffective for these types of sources.

SNCR is a post-combustion NOx control technology which requires uniform mixing of the reagent and exhaust gas within a narrow temperature range. Operations outside of these operating conditions will significantly reduce removal efficiencies and may result in ammonia emissions, increased NOx emissions. No examples were found where SNCR has been applied to aluminum smelting pots. Therefore, SNCR is not technically feasible for the smelting pots.

SCR to effectively reduce NOx emissions, the exhaust gas stream should have a relatively stable gas flow rate, NOx concentration, and temperature. SCR also requires a specific exhaust gas temperature range and pollutant loading for efficient operation. The exhaust gas of the aluminum potline smelters is expected to have temperatures much lower than the required temperature range. Additionally, the expected NOx concentration is lower than the effective control range for SCR.

Step 3 – Rank Options by Control Effectiveness

Since there is no external fuel combusted in the smelting cells, there are no technically feasible pre-combustion NOx controls for the potlines. Likewise, there are no technically feasible add-on controls because of the temperature of the potroom exhaust (approximately 200°F) and extremely low NOx concentration.

The only remaining control option is the use of good work practices.

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

Since there is no external fuel combusted and no nitrogen rich material used, no further emissions control will be evaluated. Good work practices will also be implemented to serve as BACT.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as good work practices. These work practices will be implemented to meet the numeric emission limits presented in Table 2 below.

TABLE 2: POTROOMS A&B NOx NUMERIC EMISSION LIMITS

Source ID	Description	NOx
		lb/hr
321-1, 321-2, 322-1	Potroom A-1, B-1, vented through GTC 1 with FGD and roof vents	4.50
321-3, 321-4, 322-2	Potroom A-2, B-2, vented through GTC 2 with FGD and roof vents	4.50

3.3.1.3 SO_2 BACT

Aluminum is produced from alumina in the pot as current is passed from a carbon anode to carbon blocks on the pot wall, which serve as the cathode. The anodes are made from calcined petroleum coke and pitch. SO_2 and COS originate from the sulfur in the components used to make the anodes.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing SO_2 emissions are described below.

Wet Scrubbing

Wet scrubbers are systems designed to remove sulfur dioxide (SO_2) from exhaust gases by maximizing contact between the gas and a slurry of lime or limestone. The SO_2 reacts with the slurry to form calcium sulfite and sulfate, and the scrubbing liquid is continuously recycled. Various scrubber designs—such as packed towers and venturi scrubbers—can be used, and alternative absorbents like sodium or ammonia solutions are also available. However, wet scrubbers are sensitive to particulates, which can clog components, requiring placement downstream of a baghouse and significantly increasing costs. They can also produce sludge waste that demands complex treatment, often involving unreliable reverse osmosis systems. However, a scrubber can be designed so that the byproduct is gypsum, a potentially saleable material.

Spray Dryer Absorption (SDA)

SDA, also known as dry scrubbing, is an alternative to wet scrubbing for removing SO_2 from exhaust gases. In this process, a solution of sodium carbonate or slaked lime is atomized into fine droplets and mixed with SO_2-laden exhaust gas in a large chamber. The SO_2 reacts with the droplets to form sulfites and sulfates, while the heat from the exhaust evaporates the water, leaving behind a dry powder. The desulfurized gas exits the chamber at a temperature slightly above its dew point, and the resulting particulates are collected using corrosion-resistant baghouses.

Dry Sorbent Injection (DSI)

DSI is a lower-cost alternative to conventional FGD technologies, involving the direct injection of dry powders—such as sodium-based or lime-based sorbents—into the smelting pot or post-smelting pot region. Unlike spray-dryer absorption systems, DSI lacks a dedicated mixing chamber, which limits its SO_2 removal efficiency. While some reaction may occur with sufficient sorbent dosage, the process is highly sensitive to variations in SO_2 concentration and in-flue mixing, making its performance unpredictable.

Low Sulfur Raw Materials

The primary pollution prevention opportunity for minimizing SO_2 emissions in the smelting process is through limitations on the sulfur content of the coke and pitch used in the manufacture of green anodes. The practical limitation on SO_2 from the potline is dictated by the maximum production capacity of the potlines and a maximum sulfur content in the incoming coke and pitch. This level of sulfur in the coke and pitch is a general upper limit for producing good quality anodes. One potential option to reduce SO_2 emissions from the facility would be to reduce the sulfur content of coke and pitch used to produce anodes.

Step 2 – Eliminate Technically Infeasible Options

SDA and DSI have not been implemented for SO_2 controls from aluminum smelting potlines, as reported by the RBLC. SDA and DSI systems generate sulfite and sulfate as a dry waste product, which requires off-site disposal. Because these technologies have not been implemented at an aluminum smelter and generate a waste that requires off-site disposal, they are deemed technically infeasible. The wet scrubber is expected to generate gypsum, a potentially saleable by-product, therefore, it is a technically feasible control option. A wet scrubber has been implemented outside of a BACT determination in the U.S.A. for a potline source group.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Wet scrubbing – 90-98%
2. Low Sulfur Petroleum Coke and coal tar pitch – 25-60%

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

Use of a wet scrubber does appear in the RBLC under ID KY-0070 for NSA-A Division of Southwire Co for process Potline 5. A review of the most recent Title V permit for that facility does not list a scrubber for that process. A wet scrubber does appear in the Title V permit for processes Potlines 1-4, but the permit does not indicate that the inclusion of the scrubber was associated with a PSD permit, which is supported by no RBLC entry for a permit action that triggered PSD. Limiting the sulfur content in the petroleum coke and pitch is listed as the applicable method for SO_2 emissions reductions even though the scrubber is present.

With wet scrubbing being technically feasible and implemented at an existing facility in the United States, albeit not for BACT, an economic analysis was performed. Using an initial capital cost of $350,000,000 per wet scrubber, operational and maintenance costs of $25,000,000/year per wet scrubber, a lifespan of 20 years, and the current bank prime plus 1 loan rate of 7.75%, the calculated annual cost per ton SO_2 reduced is calculated at $10,374 per wet scrubber. This annual cost exceeds the ODEQ threshold for non-ozone precursors of $5,000, making wet scrubbing economically infeasible. Detailed calculations are presented in Appendix B.

OA will be selecting the remaining control technology, use of low sulfur petroleum coke and coal tar pitch.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of low sulfur petroleum coke to achieve SO_2 emission reductions at an annual average limit of 2.5% S and coal tar pitch at an annual average limit of 0.8%. The affected sources and numeric emission limits are presented in Table 3 below.

TABLE 3: POTROOMS A&B SO_2 NUMERIC EMISSION LIMITS

Source ID	Description	Sulfur Content %
321-1, 321-2, 322-1	Potroom A-1, B-1, vented through GTC 1 with FGD and roof vents	2.5 – coke 0.8 – pitch
321-3, 321-4, 322-2	Potroom A-2, B-2, vented through GTC 2 with FGD and roof vents	2.5 – coke 0.8 – pitch

Outside of the need to meet BACT requirements, OA will be proposing to further control SO_2 emissions for demonstrating compliance with the NAAQS via Class II modeling assessment and Class I PSD increment. The add-on control for compliance purposes will be wet scrubbers for source IDs 322-1 and 322-2.

3.3.1.4 CO AND VOC BACT

In the smelting pot, oxygen reacts with the carbon in the anode to form CO as a byproduct of incomplete combustion. The oxygen in the smelting pot is supplied by the alumina. VOCs are formed from the volatilization of residual hydrocarbons in the anode, pyrolysis of the pitch volatiles in the anode, and carbon oxidation. These pollutant types are controlled by similar mechanisms, therefore, they are presented together.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing CO and VOC emissions are described below.

Thermal Oxidation

A thermal oxidizer is a large vessel with a burner where fuel, gaseous waste, and air are introduced and combined to achieve the required DRE. The mixture must be exposed to a sufficiently high temperature for an adequate time period in a relatively turbulent environment to enable the chemical reactions to reach the degree of completion needed to achieve the DRE.

Recuperative or Regenerative Thermal Oxidation

Recuperative and regenerative thermal oxidizers (RTOs) are two types of oxidizers that are widely applied to control VOCs. Both include some form of internal heat recovery, designed to reduce the operating cost of the system related to the consumption of a fuel source (typically natural gas) to raise the incoming gas temperature up to a combustion temperature within the burner zone as necessary to achieve the desired DRE. Heat recovery may either be recuperative or regenerative. In recuperative heat recovery, heat is recovered by passing the hot exhaust gases through a non-contact air-to-air heat exchanger, to heat the incoming air to the oxidizer. In regenerative heat recovery, hot exhaust gases and cool inlet gases are alternatively passed through a fixed bed, typically employing ceramics. RTOs have the ability to achieve a DRE of up to 99%, depending on the VOC inlet concentration.

Catalytic Oxidation

Catalytic oxidizers use a bed of catalyst that facilitates the overall combustion of combustible gases. The catalyst increases the reaction rate and allows the conversion of CO and VOC to CO2 at lower temperatures than a thermal oxidizer. The catalyst is typically a porous noble metal material that is supported in individual compartments within the unit. An auxiliary fuel-fired burner ahead of the bed heats the entering exhaust gases to 600°F to maintain proper bed temperature. Recuperative heat exchangers are used to recover the exiting exhaust gas heat and reduce the auxiliary fuel consumption. Exhaust gas temperatures that are too high may cause permanent damage to the catalyst, while operating temperatures that are too low may result in a lower VOC conversion efficiency. The typical VOC removal efficiency of a catalytic oxidation system is 90% or greater. The catalytic oxidation process for VOC control is very temperature sensitive.

Good Work Practices

Because the aluminum smelter pot is not a combustion source and doesn’t have a burner, good work practices center around the design and operation of the smelting pot: use of point feeders, maintaining optimal alumina concentrations, anode quality control, and fume collection.

Step 2 – Eliminate Technically Infeasible Options

Good work practices are technically feasible for controlling CO and VOCs from an aluminum smelter pot. The inherent optimization of fume collection and temperature in the design phase of the smelter pot and parametric monitoring, including alumina concentration, during operation to maintain optimal settings is expected to produce reduced CO and VOC emissions.

Thermal oxidation has not been applied to an aluminum smelter pot or similar equipment. To reduce the potential of bed packing and to preserve the alumina fume as a recyclable product, the thermal oxidizer would have to be placed downstream of the proposed baghouse. This presents technical challenges for implementation as the exhaust gas temperature would be further reduced downstream of the baghouse, resulting in the need for a significant amount of heat input to achieve the oxidation temperature and a significantly large reaction chamber to achieve the requisite residence time for oxidation to occur. Despite these challenges, this technology is technically feasible.

Catalytic oxidation has not been applied to an aluminum smelter pot or similar equipment. The presence of HF and particulate matter in the exhaust gas, even after dry alumina scrubbing and baghouse control, can lead to catalyst poisoning and reduced or ineffective control of emissions. Catalytic oxidation is deemed technically infeasible.

Step 3 – Rank Options by Control Effectiveness

Good work practices are the only technically feasible control technology.

Step 4 - Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA will be selecting the top-ranked control technology, good work practices, therefore no further evaluation is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use good work practices to limit the formation of CO and VOC in the exhaust stream. These work practices will be implemented to meet the numeric emission limits presented in Table 2 below.

TABLE 4: POTROOMS A&B CO & VOC NUMERIC EMISSION LIMITS

Source ID	Description	CO	VOC
		lb/hr	lb/hr
321-1, 321-2, 322-1	Potroom A-1, B-1, vented through GTC 1 with FGD and roof vents	9,878.2	20.8
321-3, 321-4, 322-2	Potroom A-2, B-2, vented through GTC 2 with FGD and roof vents	9,878.2	20.8

3.3.1.5 TF BACT

In the smelting pot, the cryolite bath (Na_3AlF_3) is the source HF and particulate fluorides (considered together as Total Fluorides), which are generated when the cryolite decomposes at high temperatures and when fluorinated alumina interacts with water. The presence of fluorides in the cryolite and fluorinated alumina is necessary in dissolving the alumina and maintaining the conductivity of the cryolite bath.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing TF emissions are described below.

Dry Alumina Scrubber

Fresh alumina is injected into parallel groups of reaction chambers to capture gaseous and particulate forms of total fluorides. The reaction chambers are evenly and continuously injected with fresh alumina. This generates fluorinated alumina, which is a byproduct that can be reused at the facility.

Fabric Filter

Described in section 3.3.1.1

Venturi Scrubber

Described in section 3.3.1.1

Step 2 – Eliminate Technically Infeasible Options

Dry alumina scrubbing has been successfully implemented as BACT for several US facilities and generates fluorinated alumina, a product that can be reused in the smelter pot.

Venturi scrubbing or other forms of wet scrubbing have not been implemented for control of total fluorides. The use of such a control device would eliminate the formation of fluorinated alumina and instead create a waste by-product. Therefore, venturi and other forms of wet scrubbing are technically infeasible.

Fabric filtration is effective at capturing particulate forms of fluorinated compounds but not gaseous hydrogen fluoride. Therefore, standalone fabric filtration is technically infeasible.

Step 3 – Rank Options by Control Effectiveness

Dry alumina scrubbing is the only remaining feasible control technology, therefore is the top-ranked control technology. The dry scrubber is located upstream of the baghouse, which provides capture and control of the fluorinated alumina particulates.

Step 4 - Evaluate Effectiveness of Controls and Achievability of Emission Limits

A dry alumina scrubber is capable of reducing total fluoride emissions by 95-99%. When a fabric filtration system (baghouse) follows the dry alumina scrubber reaction chamber, total fluoride emission reductions can exceed 99%. The implementation of these control technologies enable the new operations to demonstrate compliance with the Total Fluorides emission limit of 1.2 lb/ton of aluminum produced.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of dry alumina scrubbing in a reaction chamber, followed by a fabric filtration baghouse to achieve a TF emission factor of 1.02 lb/ton. This is lower than the 40 CFR Part 63 Subpart LL emission factor limit of 1.2 lb PM/ton. The affected sources and emission limits are present in Table 5.

TABLE 5: POTROOMS A&B TF NUMERIC EMISSION LIMITS

Source ID	Description	TF Emission Factor lb/ton
321-1, 321-2, 322-1	Potroom A-1, B-1, vented through GTC 1 with FGD and roof vents	1.02
321-3, 321-4, 322-2	Potroom A-2, B-2, vented through GTC 2 with FGD and roof vents	1.02

3.3.1.6 GHG BACT

In the smelting pot, oxygen reacts with the carbon in the anode to form CO_2 as a product of combustion. The oxygen in the smelting pot is supplied by the alumina. Perfluorocarbons are also generated when the alumina concentration gets too low, leading to the formation of CF_4 and C_2F_6.

Step 1 – Identify Potential Control Technologies

Potentially available technologies for reducing GHG emissions are described below.

Improved Process Controls

Modern technology that includes the use of sensors and algorithms can optimize the conditions of operation to effectively use the energy required to operate the aluminum smelter pot. These controls can also be used to monitor the cryolite bath to correct the alumina ratio and add more alumina to the bath.

Energy Efficient Design

Thermal efficiency is an emissions reduction strategy focused on increasing energy efficiency. Higher thermal efficiency means less electricity is required for melting and supplemental heat from fuel combustion is not required.

Carbon Capture and Sequestration

Carbon capture and sequestration (CCS) makes use of specialized equipment to extract CO_2 from the exhaust stream and is eventually injected underground for storage.

Step 2 – Technical Feasibility of Control Technologies

Improved process controls are technically feasible for controlling emissions of GHG and are a part of modern equipment design. These controls optimize air flow and temperature to optimize combustion in the EAF. These controls also trigger responses to changes in the cryolite bath chemistry to enable adjustments that reduce the formation of perfluorocarbons.

Energy efficient designs are technically feasible for controlling emissions of GHG and are a part of modern equipment design. Durable materials and furnace designs that limit the intrusion of excess air facilitate complete combustion while also limiting heat loss, leading to a lower energy demand.

CCS requires the CO_2 to be captured from the exhaust stream, compressed, and transported via pipeline to a storage operation. CCS on industrial property has not been successfully implemented on an industrial scale. The closest commercial storage operation is the CapturePoint Oklahoma Carbon Hub, located approximately 81 straight-line miles from the proposed facility. This location is currently permitted as a Class II facility with applications for Class VI storage. Because the storage operation does not have a Class VI permit it cannot be used to store CO_2 from the proposed OA facility, CCS is deemed technically infeasible.

Step 3 – Rank Technologies by Control Effectiveness

Improved process controls and energy efficient designs are both ranked equally as the most effective control technology.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

Due to these options being technically feasible and part of the aluminum smelter pot design, no environmental or economic analysis is required.

Step 5 – BACT Selection

Based on the analysis of this section, OA proposes BACT for GHGs to be improved process controls and energy efficient design. A numeric value of 6,936,294 tpy of CO_2e will be set for the combined Potrooms emissions.

3.3.2 POTLINE SERVICES (POTSHELL LINING/DELINING, CRUCIBLE CLEANING, TAPING TUBE CLEANING)

Potline Services will include cathode rodding, pot delining/relining, spent pot lining storage, crucible cleaning, PTM maintenance, potline equipment maintenance, and the central control room. These facilities will support the operational integrity and maintenance of the potline, ensuring continuous and efficient aluminum production.

3.3.2.1 PM/PM_{10}/$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing PM/PM_{10}/$PM_{2.5}$ emissions are described below.

Fabric Filter

Described in section 3.3.1.1

Electrostatic Precipitator

Described in section 3.3.1.1

Venturi Scrubber

Described in section 3.3.1.1

Step 2 – Technical Feasibility of Control Technologies

All technologies are technically feasible.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Fabric Filter Baghouse – 90 - 99%
2. Electrostatic Precipitator - 90 – 99%
3. Venturi Scrubber – 70 – 99%

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA will be selecting the top-ranked control technology, use of fabric filtration, therefore no further evaluation is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of fabric filtration to achieve an emission limit of 0.003 gr/dscf for PM and PM_{10} and 0.0015 gr/dscf for $PM_{2.5}$. The affected sources and numeric emission limits are presented in Table 6 below.

TABLE 6: POTLINE SERVICES NUMERIC EMISSION LIMITS

Source ID	Description	PM Emission Factor gr/dscf	PM_{10} Emission Factor gr/dscf	$PM_{2.5}$ Emission Factor gr/dscf
341-1	Cast Iron Melting Induction Furnace	0.003	0.003	0.0015
342-2	Pot Delining	0.003	0.003	0.0015
344-1	Crucible Repair Station	0.003	0.003	0.0015
344-2	Crucible Cleaning Machine	0.003	0.003	0.0015
344-3	Tube Cleaning Machine	0.003	0.003	0.0015
344-4	Crucible Lid Cleaning	0.003	0.003	0.0015

3.3.3CASTHOUSE SERVICES (CRUCIBLE SKIMMING, DROSS PRESS)

Crucible skimming and treatment stations remove impurities from the metal using sodium reduction and aluminum fluoride injection. Three automatic skimming and weighing stations are installed, with additional weighing stations for empty crucibles post-delivery.

Dross will be pressed to extract liquid metal. The remaining dross will be shipped offsite for further processing.

3.3.3.1 PM/PM_{10}/$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing PM/PM_{10}/$PM_{2.5}$ emissions are described below.

Fabric Filter

Described in section 3.3.1.1

Electrostatic Precipitator

Described in section 3.3.1.1

Venturi Scrubber

Described in section 3.3.1.1

Step 2 – Technical Feasibility of Control Technologies

All technologies are technically feasible.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Fabric Filter Baghouse – 90 - 99%
2. Electrostatic Precipitator - 90 – 99%
3. Venturi Scrubber – 70 – 99%

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA will be selecting the top-ranked control technology, use of fabric filtration, therefore no further evaluation is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of fabric filtration to achieve an emission limit of 0.005 gr/dscf or better. The affected sources and numeric emission limits are presented in Table 7 below.

TABLE 7: CASTHOUSE SERVICES NUMERIC EMISSION LIMITS

Source ID	Description	PM Emission Factor gr/dscf	PM_{10} Emission Factor gr/dscf	$PM_{2.5}$ Emission Factor gr/dscf
460-1	Sodium Reduction Bay 1	0.005	0.005	0.0025
460-2	Sodium Reduction Bay 2	0.005	0.005	0.0025
470-1	Dross Press #1	0.005	0.005	0.0025
470-2	Dross Press #2	0.005	0.005	0.0025
470-3	Dross Press #3	0.005	0.005	0.0025

3.3.4 CASTHOUSE VOC USAGE

The casthouse will include two categories VOC containing material usage. The first category is a marking operation that utilizes VOC-containing ink to mark the cast products with IDs for tracking purposes. The second category is the use of a VOC-containing material to coat the caster molds to facilitate the release of the cast product from the mold.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for VOC usage in the casthouse are described below.

Low-VOC Materials

Use of low-VOC containing materials involves selecting inks and coatings that have low VOC content or are water-based materials. Low VOC content involves materials with less than 5 lb VOC/gal of material.

UV-curable inks

Use of UV-curable inks involves using an ink that, when exposed to UV light, triggers a chemical reaction to harden the applied ink before the VOCs in the ink can evaporate.

Efficient Application

The ink marking is a manual process performed by a human operator. The operator can be trained to utilize marking techniques that minimize the ink usage and increase the transfer efficiency. The mold coating system is an automated process that can utilize high-transfer efficiency nozzles to minimize VOC emissions.

Good Work Practices

Good work practices involves storing inks and mold coatings in closed containers, cleaning up spills quickly, and optimizing the material usage.

Capture and Destruction Technologies

Control technologies that capture and control VOC emissions like thermal oxidizers, catalytic oxidizers, and carbon adsorbers have been previously described in Section 3.3.1.4.

Step 2 – Technical Feasibility of Control Technologies

For the ink marking operations, use of low VOC containing materials is technically feasible as inks meeting that criteria are commercially available. UV-curable inks are not technically feasible as the marking operations are performed in an open environment, which does not lend to the operation of a UV curing system. Ink application is to be performed manually, therefore it is technically feasible to implement efficient application techniques. Good work practices are technically feasible through operating procedures. Given the open environment of the marking operations and very low expected emissions, control through capture and destruction technologies is not technically feasible.

For the mold coating operation, use of low VOC materials is technically feasible as these materials are commercially available and have been effectively demonstrated. Efficient application is technically feasible as the application nozzles can be design and operated to maximize transfer efficiency. Good work practices are technically feasible through operating procedures. Capture and destruction technologies are technically feasible as the casting operations are performed under a fume hood, which would allow for the installation of a capture or destruction device.

Step 3 – Rank Options by Control Effectiveness

For the ink marking operations, the control technologies are ranked as follows:

1. Low VOC materials (50% - 95%)
2. Efficient application techniques (40% - 90%)
3. Good work practices (0% - 50%)

For the mold coating operations, the control technologies are ranked as follows:

1. Capture and destruction technologies (90% - 98%)
2. Low VOC materials (50% - 95%)
3. Efficient application (40% - 90%)
4. Good working practices (0% - 50%)

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

For ink marking, OA will be using the top-ranked control technology, the use of low VOC material and a combination of the other two control technologies. No further analysis is required.

For the mold coating operation, use of capture and destruction technology is not economically feasible as the expected annual emissions of VOC are less than 5 tons. OA will be using the second-ranked control technology, use of low VOC material and a combination of the other two control technologies. No further analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT to be the use of low VOC materials in the ink marking and mold coating operation. The VOC content of the ink will be limited to 5.0 lb VOC/gal of ink. The VOC content of the mold coating will be limited to 2.4 lb VOC/gal. The affected source IDs are 430-2 (Mold Coating System), 430-4 (Ingot Stamping), and 430-5 (Billet Marking).

3.3.5 SOLID MATERIAL STORAGE SILOS

Large, industrial-grade storage silos are essential for primary aluminum smelting to hold, manage, and deliver the necessary solid materials. The main materials requiring silo storage are alumina and various carbon products, such as calcined petroleum coke and recycled anode butts. The expected emissions from these storage silos are $PM/PM_{10}/PM_{2.5}$.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for solid material storage silos are described below.

Wet Suppression or Water Sprays

Water sprays or wet suppression relies on agglomeration or entrapment of particulate to reduce the amount that becomes airborne.

Fabric Filtration (Bin Vent Filter)

This type of particulate control technology utilizes filters to remove dry particles from gas streams. 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.

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 proper equipment maintenance can be employed to prevent particulate from becoming airborne.

Step 2 – Technical Feasibility of Control Technologies

Fabric filtration and good housekeeping are technically feasible control options. Fabric filtration, or bin vent filtration, is prevalently used in the metals and other industries for controlling particulate emissions from solid material storage. Good housekeeping practices include subjecting the filter to regular cleaning and replacement.

Wet suppression and water sprays for controlling particulates is technically infeasible for the storage silos as the collected materials must be used in production, recycled, or disposed offsite. Wet materials could impact product quality, the recyclability of the materials, or cause a clog in the storage silo.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Fabric filtration (bin vent filter) - 90-99.9%
2. Good housekeeping practices

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA will be selecting the top-ranked control technology, use of fabric filtration, therefore no further evaluation is required. The filter specifications will meet the outlet grain loading requirement that is established as BACT.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of fabric filtration (bin vent filter) to achieve an emission factor of 0.005 gr/dscf on all material storage silos at the facility. Good housekeeping practices will also be implemented to serve as BACT. The affected source IDs and numeric emission limits are presented in the Table 8 below.

TABLE 8: SOLID MATERIAL STORAGE SILOS PM/PM_{10}/$PM_{2.5}$ NUMERIC EMISSION LIMITS

Source ID	Description	PM Emission Factor gr/dscf	PM_{10} Emission Factor gr/dscf	$PM_{2.5}$ Emission Factor gr/dscf
810-1	Alumina Storage #1	0.005	0.005	0.0025
810-2	Alumina Storage #2	0.005	0.005	0.0025
820-1	AIF3 Handling and Storage	0.005	0.005	0.0025
830-1	CPC Storage #1	0.005	0.005	0.0025
830-2	CPC Storage #2	0.005	0.005	0.0025
830-3	CPC Buffer Silo	0.005	0.005	0.0025
250-4	Pure Bath Silo	0.005	0.005	0.0025
260-2	Carbon recycled material storage	0.005	0.005	0.0025
328-1	Fresh Alumina Handling & Storage 1	0.005	0.005	0.0025
328-2	Fresh Alumina Handling & Storage 2	0.005	0.005	0.0025

3.3.6 PASTE MATERIAL HANDLING AND PREPARATION OPERATIONS

The paste creation process begins with the handling of the source materials. These source materials include calcined petroleum coke and recycled baked anode dust. These materials undergo handling and storage in silos, crushing and screening to appropriate sizing, proportioning to the correct recipe, and milling operations. Particulate matter in the form of PM/PM_{10}/$PM_{2.5}$ are the emissions from this operation. These operations are combined for BACT purposes as the materials are in the same physical state throughout the process.

3.3.6.1 PM/PM_{10}/$PM_{2.5}$ BACT

Emissions of PM/PM_{10}/$PM_{2.5}$ consist of dry calcined petroleum coke particles and recycled anode materials during each of the processes in this operation.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing $PM/PM_{10}/PM_{2.5}$ emissions from paste handling operations are described below.

Baghouse filters

Baghouse filters have been described in Section 3.3.1.1 for fabric filtration.

Electrostatic Precipitator

Electrostatic precipitators have been described in Section 3.3.1.1.

Venturi Scrubber

Venturi scrubbers have been described in Section 3.3.1.1.

Cyclone

Cyclones have been described in Section 3.3.1.1.

Dry Sorbent Injection

Dry sorbent injectors (DSIs) work by the injection of dry materials (sorbent) into the exhaust stream to capture gases and particulates into the sorbent. The sorbent is then removed from the gas stream through another particulate control device, such as a baghouse. The post-injection control device is the component that dictates the control efficiency of the technology.

Step 2 - Technical Feasibility of Control Technologies

Baghouse filtration and cyclones are technically feasible as they do not change the physical state of the calcined petroleum coke and the baked anode dust and have been demonstrated as effective in existing facilities – cyclones typically precede additional control technologies like a baghouse.

Electrostatic precipitation is technically feasible but has not been implemented at a primary aluminum smelting facility.

DSI is technically feasible but requires an add-on control device such as a baghouse or electrostatic precipitator to control particulates. It has been implemented at a primary aluminum smelting facility.

Venturi scrubbing introduces liquid to achieve effective control, thereby eliminating the reusability of the captured emissions, and thereby making the technology technically infeasible.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Baghouse filters – 90 – 99%
2. Electrostatic Precipitator – 90 – 99%
3. DSI – requires add-on controls like baghouse filters or ESP.

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA will be selecting the top-ranked control technology, use of a baghouse, therefore no further evaluation is required. The baghouse will be preceded by a dry sorbent injection system, utilizing coke fines. The baghouse will enable the process to meet an emission factor of 0.002 grains/dscf and emissions control of 99%.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT for paste material handling and preparation activities to be baghouse control, preceded by a coke fines DSI system, to achieve 98% control of $PM/PM_{10}/PM_{2.5}$ and an emission rate of 0.002 grains/dscf. This grain loading meets the established BACT emission limit for secondary aluminum processes. The affected source IDs and numeric emission limits are presented in the Table 9 below.

TABLE 9: PASTE MATERIAL HANDLING AND PREPARATION $PM/PM_{10}/PM_{2.5}$ NUMERIC LIMITS

Source ID	Description	PM Emission Factor gr/dscf	PM_{10} Emission Factor gr/dscf	$PM_{2.5}$ Emission Factor gr/dscf
210-1	Paste Plant Coke Handling & Storage	0.005	0.005	0.0025
210-2	Paste Plant Dry Matter Crushing & Screening	0.005	0.005	0.0025
210-3	Paste Plant Proportioning and Preheating	0.005	0.005	0.0025
210-4	Vertical Mill #1	0.005	0.005	0.0025
210-5	Vertical Mill #2	0.005	0.005	0.0025

3.3.7 PASTE MIXING AND ANODE FORMING OPERATIONS

Paste mixing lines are a critical part of the anode production process, particularly for prebaked anodes. These lines are responsible for preparing the carbon paste used to form anodes, which are essential for conducting electricity during the electrolytic reduction of alumina to aluminum. The mixing and forming operations and the liquid pitch tank will be ducted to a common control and release point. Two paste lines are proposed as part of the project, each with their own release point.

Paste mixing lines primarily emit SO_2, VOCs, PM, PAHs and coal tar pitch volatiles. VOCs, PAH, and coal tar pitch can be controlled by the same technologies, and therefore, will be evaluated concurrently.

3.3.7.1 $PM/PM_{10}/PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing $PM/PM_{10}/PM_{2.5}$ emissions are described below.

Fabric Filter

Described in section 3.3.1.1

Electrostatic Precipitator

Described in section 3.3.1.1

Venturi Scrubber

Described in section 3.3.1.1

Step 2 – Technical Feasibility of Control Technologies

All technologies are technically feasible.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Fabric Filter Baghouse – 90 - 99%
2. Electrostatic Precipitator - 90 – 99%
3. Venturi Scrubber – 70 – 99%

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

A fabric filter baghouse would be the most effective method to control PM emissions from the paste mixing and anode forming process. The total potential emissions from this process are 0.65 tons per year from each release point. An annualized cost analysis for the installation and operation of a baghouse for each release point determined a cost-effectiveness of $281,656 per ton PM removed per year. This analysis demonstrates that controlling PM from this process is not economically feasible. Given the very small uncontrolled PM emissions, it is assumed that the other control technologies would also be economically infeasible. Therefore, no control technologies are effective controls for this process.

Step 5 – Select BACT

Based on the analysis of the section, OA is not proposing controls for PM from this process. The uncontrolled PM emission rate 0.0052 lb/ton green paste, is compliant with the 40 CFR Part 63 Subpart LL standard for a paste production plant emission limit of 0.0056 lb/ton green anode.

3.3.7.2 VOC, PAH, AND COAL TAR PITCH BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing emissions of VOCs and PAH include the following technologies.

Thermal oxidizers

Thermal oxidation works to raise the temperature of the exhaust gas in a chamber with oxygen to oxidize VOCs and PAH to CO_2. To raise the temperature in thermal oxidation, an incinerator typically fueled by natural gas, is installed before the process exhaust is emitted to atmosphere. Regenerative thermal oxidation utilizes a ceramic-packed bed that recovers heat from the combustion chamber to preheat the incoming exhaust gas, which leads to less natural gas used in the reaction chamber for achieve the proper oxidation temperature for controlling VOCs and PAH. The prevent packing of the ceramic bed, pretreatment to reduce the particulate loading of exhaust air is necessary. This pretreatment step results in additional cooling of the exhaust gas, resulting in higher utilization of the natural gas burner to achieve the proper oxidation temperature.

Catalytic Oxidation

Catalytic oxidation works very similarly to thermal oxidation, the difference is that a catalyst material is used rather than a ceramic in the packed bed. The catalyst allows for oxidation to occur at a lower gas temperature than a thermal system. Catalysts are typically platinum or palladium. Pretreatment of the gas stream to reduce the particulate loading of exhaust air is necessary to extend the lifespan of the catalyst, however, particulate constituents like silicon, arsenic, or other heavy metals can result in catalyst poisoning. Sulfur is another exhaust constituent that can result in catalyst poisoning.

Dry Sorbent Injection

Dry sorbent injection has been described in Section 3.3.4.1.

Step 2 - Technical Feasibility of Control Technologies

Use of a thermal oxidizer is technically feasible for controlling VOCs and PAH. The particulate content of the exhaust gas is expected to be low, therefore packing of the ceramic bed is anticipated to be minimal. Additionally, the operating schedule is expected to supply a consistent VOC and PAH concentrations to the oxidizer to reduce the need for excessive additional heat input. A regenerative thermal oxidizer (RTO) will be utilized for energy efficiency.

The presence of sulfur in the exhaust can lead to poisoning of the catalyst in a catalytic oxidizer. This poisoning would result in frequent change-out of the catalyst to maintain the control efficiency and therefore, it is technically infeasible. No aluminum production facilities have used catalytic oxidizing for controlling emissions from paste mixing and forming operations.

DSI is technically feasible for controlling VOCs and PAH. Coke fines are suitable injection material for absorbing the VOCs and PAH. The absorbent can also be reused in the process, instead of generating a waste by-product.

Step 3 – Rank Options by Control Effectiveness

The technologies to control VOCs and PAH are ranked as follows:

1. Thermal oxidation, RTO (95%-99% control)
2. DSI, coke fines (50%-90% control)

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA is proposing to use RTO control, which is the top-ranked control technology. No further analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT for paste mixing and forming operations to be RTO control, achieving a control efficiency of 95%. This control efficiency demonstrates compliance with the control efficiency requirement for pitch storage tanks (95%) per 40 CFR Part 63 Subpart LL, 63.844(d). The RTO will utilize natural gas as the supplemental fuel to achieve and maintain the required temperature for VOC and PAH destruction. The affected source IDs and numeric emission limits are presented in the Table 10 below.

TABLE 10: PASTE MIXING AND ANODE FORMING PAH AND VOC NUMERIC EMISSION LIMITS

Source ID	Description	PAH Destruction Efficiency	VOC Destruction Efficiency
210-6	Paste Plant #1, CTP storage, paste mixing & forming	95%	95%
210-7	Paste Plant #2, CTP storage, paste mixing & forming	95%	95%

3.3.7.3 SO_2 BACT

Step 1 – Identify Potential Control Technologies

Low-sulfur raw materials

Petroleum coke and liquid pitch are the raw materials used to produce the anode paste. These products contain sulfur at varying percentages. Controlling the amount of sulfur in the raw materials has a direct impact on the amount of sulfur that is oxidized and emitted.

Wet Scrubbing

Wet scrubbers are systems designed to remove sulfur dioxide (SO_2) from exhaust gases by maximizing contact between the gas and a slurry of lime or limestone. The SO_2 reacts with the slurry to form calcium sulfite and sulfate, and the scrubbing liquid is continuously recycled. Various scrubber designs—such as packed towers and venturi scrubbers—can be used, and alternative absorbents like sodium or ammonia solutions are also available. However, wet scrubbers are sensitive to particulates, which can clog components, requiring placement downstream of a baghouse and significantly increasing costs. They also produce sludge waste that demands complex treatment, often involving unreliable reverse osmosis systems.

Spray Dryer Absorption (SDA)

SDA, also known as dry scrubbing, is an alternative to wet scrubbing for removing SO_2 from exhaust gases. In this process, a solution of sodium carbonate or slaked lime is atomized into fine droplets and mixed with SO_2-laden exhaust gas in a large chamber. The SO_2 reacts with the droplets to form sulfites and sulfates, while the heat from the exhaust evaporates the water, leaving behind a dry powder. The desulfurized gas exits the chamber at a temperature slightly above its dew point, and the resulting particulates are collected using corrosion-resistant baghouses.

Dry Sorbent Injection (DSI)

DSI is a lower-cost alternative to conventional FGD technologies, involving the direct injection of dry powders—such as sodium-based or lime-based sorbents—into the furnace or post-furnace region. Unlike spray-dryer absorption systems, DSI lacks a dedicated mixing chamber, which limits its SO_2 removal efficiency. While some reaction may occur with sufficient sorbent dosage, the process is highly sensitive to variations in SO_2 concentration and in-flue mixing, making its performance unpredictable.

Step 2 – Technical Feasibility of Control Technologies

Selecting low-sulfur raw material sources, such as low-sulfur petroleum coke and low-sulfur pitch, is technically feasible. Elimination of these materials would negatively impact the produced anode, therefore, it is not possible to eliminate those materials from the process.

Wet scrubbing, SDA, and DSI have no record of implementation for paste mixing and forming processes. The expected concentration of SO_2 in the exhaust stream is approximately 7 ppm. The expected SO_2 concentration range for effective control is 250 to 10,000 ppm, therefore, these add-on control technologies are technically infeasible.

Step 3 - Rank Options by Control Effectiveness

Low-sulfur raw material sources is the only remaining control technology, therefore it is the top-ranked technology.

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA is proposing to use low-sulfur raw materials, which is the top-ranked control technology. No further analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of low sulfur materials, with an annual average sulfur content limit of 2.5% of the calcined petroleum coke (CPC) and 0.8% in the coal tar pitch (CTP). This sulfur content limit is consistent with other BACT determinations and operating aluminum smelter facilities in the United States. The affected source IDs and numeric emission limits are presented in the Table 11 below.

TABLE 11: PASTE MIXING AND ANODE FORMING SO_2 NUMERIC EMISSION LIMITS

Source ID	Description	SO_2	
		CPC S content	CTP S content
210-6	Paste Plant #1, CTP storage, paste mixing & forming	2.5%	0.8%
210-7	Paste Plant #2, CTP storage, paste mixing & forming	2.5%	0.8%

3.3.8 ANODE BAKING FURNACES

Anode baking furnaces are critical emission sources in primary aluminum smelting, releasing pollutants such as total fluorides (HF and particulates containing F), SO_2, CO, NO_x, polycyclic aromatic hydrocarbons (PAHs), and particulate matter ($PM/PM_{10}/PM_{2.5}$).

3.3.8.1 $PM/PM_{10}/PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing $PM/PM_{10}/PM_{2.5}$ emissions from the anode baking furnaces are described below.

Baghouse filters

Baghouse filters have been described in Section 3.3.1.1 for fabric filtration.

Electrostatic Precipitator

Electrostatic precipitators have been described in Section 3.3.1.1.

Venturi Scrubber

Venturi scrubbers have been described in Section 3.3.1.1.

Cyclone

Cyclones have been described in Section 3.3.1.1.

Step 2 – Technical Feasibility of Control Technologies

Cyclones are frequently followed by a baghouse filter, therefore are not considered best control technology.

Venturi scrubbing or other forms of wet scrubbing have not been implemented for control of total fluorides. The use of such a control device would eliminate the formation of fluorinated alumina and instead create a waste by-product. Therefore, venturi and other forms of wet scrubbing are technically infeasible.

Electrostatic precipitation is technically feasible but has not been implemented for an anode baking furnace.

Fabric filtration is effective at capturing particulate forms of fluorinated compounds but not gaseous hydrogen fluoride. Therefore, fabric filtration will be paired with dry scrubbing for hydrogen fluoride control. This control technology has been previously determined as BACT for anode bake furnaces.

Step 3 – Rank Options by Control Effectiveness

The technologies to control $PM/PM_{10}/PM_{2.5}$ emissions are ranked as follows:

1. Fabric filtration paired with dry alumina scrubbing – 90 – 99%
2. Electrostatic precipitator – 90 – 99%

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA proposes to use the top-ranked control technology, fabric filtration paired with dry alumina scrubbing. Therefore, no further analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT to be fabric filtration following dry alumina scrubbing. The affected units and emission factors are presented in Table 12. These emission factors are compliant with the PM standard for anode bake furnaces in 40 CFR Part 63 Subpart LL 63.844(c)(3), which is 0.07 lb PM/ton green anode.

TABLE 12: ANODE BAKING FURNACES PM/PM_{10}/$PM_{2.5}$ NUMERIC EMISSION LIMITS

Source ID	Description	PM	PM_{10}	$PM_{2.5}$
		lb/ton	lb/ton	lb/ton
230-1	Anode Baking Furnace #1 Baking Fires and FTC	0.043	0.042	0.042
230-2	Anode Baking Furnace #2 Baking Fires and FTC	0.043	0.042	0.042

3.3.8.2 CO, VOC, PAH, AND COAL TAR PITCH BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing emissions of VOCs and PAH include the following technologies. Coal tar pitch emissions are grouped under VOC emissions. The technologies to control VOCs and PAH are the same as those used to control CO, so they will be evaluated concurrently.

Thermal oxidizers

Thermal oxidation has been described in Section 3.3.6.1.

Catalytic Oxidation

Catalytic oxidation has been described in Section 3.3.6.1.

Dry Sorbent Injection

Dry sorbent injection has been described in Section 3.3.4.1.

Step 2 - Technical Feasibility of Control Technologies

Use of a thermal oxidizer is technically feasible for controlling VOCs and PAH. The particulate content of the exhaust gas is expected to be low, therefore packing of the ceramic bed is anticipated to be minimal. Additionally, the operating schedule is expected to supply a consistent VOC and PAH concentrations to the oxidizer to reduce the need for excessive additional heat input. A regenerative thermal oxidizer (RTO) will be utilized for energy efficiency. Due to the high combustion chamber temperature required to combust the VOC and PAH, CO will be similarly combusted as the combustion temperature of CO is less than the VOC and PAH gases.

The presence of sulfur in the exhaust can lead to poisoning of the catalyst in a catalytic oxidizer. This poisoning would result in frequent change-out of the catalyst to maintain the control efficiency and therefore, it is technically infeasible. No aluminum production facilities have used catalytic oxidizing for controlling emissions from paste mixing and forming operations.

DSI is technically feasible for controlling VOCs and PAH. Coke fines are suitable injection material for absorbing the VOCs and PAH. The absorbent can also be reused in the process, instead of generating a waste by-product. CO would not be controlled by DSI.

Step 3 – Rank Options by Control Effectiveness

The technologies to control VOCs and PAH are ranked as follows:

1. Thermal oxidation, RTO (95%-99% control)
2. DSI, coke fines (50%-90% control)

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA is proposing to use RTO control, which is the top-ranked control technology. No further analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT for anode baking furnace operations to be RTO control, achieving a control efficiency 95%. The RTO will utilize natural gas as the supplemental fuel to achieve and maintain the required temperature for VOC and PAH destruction. The affected units and numeric limits are presented in Table 13. These emission factors are compliant with the POM standard for anode bake furnaces in 40 CFR Part 63 Subpart LL 63.844(c)(2), which is 0.05 lb POM/ton green anode.

TABLE 13: ANODE BAKING FURNACES CO, PAH, AND VOC NUMERIC EMISSION LIMITS

Source ID	Description	CO lb/ton	PAH Control Efficiency	VOC Control Efficiency
230-1	Anode Baking Furnace #1 Baking Fires and FTC	2.78	95%	95%
230-2	Anode Baking Furnace #2 Baking Fires and FTC	2.78	95%	95%

3.3.8.3 SO_2 BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing SO_2 emissions are described below.

Wet Scrubbing

Wet scrubbers have been described in Section 3.3.1.1.

Spray Dryer Absorption (SDA)

SDA has been described in Section 3.3.1.1.

Dry Sorbent Injection (DSI)

DSI has been described in Section 3.3.1.1.

Low Sulfur Petroleum Coke and Coal Tar Pitch

Low sulfur petroleum coke has been described in Section 3.3.1.1.

Step 2 – Technical Feasibility of Control Technologies

Add-on controls for anode baking furnaces have not been established as BACT or implemented at an aluminum smelting facility. The expected SO_2 concentration in the exhaust stream is expected to be approximately 34,200 ppm, which is greater than the effective range of typical add-on controls like wet scrubbing, SDA, and DSI. Because add-on controls would require an additional method to dilute the exhaust stream, they are deemed technically infeasible.

Use of low sulfur petroleum coke is technically feasible and has been implemented successfully at other facilities.

Step 3 – Rank Options by Control Effectiveness

Only one control technology remains, therefore, it is the top-ranked control technology.

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

Use of low sulfur petroleum coke and coal tar pitch is the only control technology remaining, therefore, no additional analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT for anode baking furnace operations to be use of low sulfur petroleum coke and coal tar pitch. The sulfur content of the petroleum coke will meet a limit of 2.5% on an annual average and the coal tar pitch will meet a limit of 0.8% on an annual average. The affected units and numeric limits are presented in Table 14.

TABLE 14: ANODE BAKING FURNACES SO_2 NUMERIC EMISSION LIMITS

Source ID	Description	Sulfur Content	
		Petroleum Coke	Coal Tar Pitch
230-1	Anode Baking Furnace #1 Baking Fires and FTC	2.5%	0.8%
230-2	Anode Baking Furnace #2 Baking Fires and FTC	2.5%	0.8%

3.3.8.4 TF BACT

Step 1 – Identify Potential Control Technologies

Potentially available control technologies to control TF are described below.

Dry Alumina Scrubber

Dry alumina scrubbers were described in Section 3.3.1.5.

Wet Scrubbing

Wet scrubbers have been described in Section 3.3.1.1.

Step 2 – Technical Feasibility of Control Technologies

When TF interacts with water, it becomes hydrofluoric acid, a highly corrosive acid. This corrosivity, in addition to converting the TF to a waste product instead of a usable product (fluorinated alumina), results in this technology being deemed technically infeasible.

Dry alumina scrubbers have been established as BACT, have been demonstrated as effective, and create a usable product, therefore, the technology is technically feasible.

Step 3 – Rank Options by Control Effectiveness

Only one feasible control technology remains, therefore it is the top-ranked control technology.

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

Use of dry alumina scrubbing is the only control technology remaining, therefore, no additional analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT for anode baking furnace operations to be use dry alumina scrubbing. The affected units and numeric limits are presented in Table 15. These emission factors are compliant with the TF standard for anode bake furnaces in 40 CFR Part 63 Subpart LL 63.844(c)(1), which is 0.02 lb TF/ton green anode.

TABLE 15: ANODE BAKING FURNACES TF NUMERIC EMISSION LIMITS

Source ID	Description	TF
		lb/ton
230-1	Anode Baking Furnace #1 Baking Fires and FTC	0.0031
230-2	Anode Baking Furnace #2 Baking Fires and FTC	0.0031

3.3.8.5 NO_X BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing NO_X emissions are described below.

Selective Catalytic Reduction

SCR has been described in Section 3.3.1.2.

Selective Non-Catalytic Reduction - SNCR

SNCR has been described in Section 3.3.1.2.

Non-Selective Catalytic Reduction - NSCR

NSCR has been described in Section 3.3.1.2.

Low-NO_x Burners

Low-NO_x burner technology has been used since the early 1970's for thermal NO_x control. These specially designed burners employ a variety of principles including LEA (low excess air), OSC (off-stoichiometric), and FGR (flue gas recirculation). The objective in the application of LNBs is to minimize NO_x formation while maintaining acceptable combustion of carbon and hydrogen in the fuel. The differences between a low-NO_x burner and a burner featuring LEA or FGR, for example, are not always clear. In general, LNBs implement LEA, OSC, FGR, or a combination of these techniques. In a stricter sense, LNBs have been defined as burners that control NO_x formation by carrying out the combustion in stages (OSC) and, further, by controlling the staging at and within the burner rather than in the firebox. Consistent with this definition, there are two distinct types of designs for LNBs: staged air burners; and staged fuel burners. Staged air burners are designed to reduce flame turbulence, delay fuel/air mixing, and establish fuel-rich zones for initial combustion. The reduced availability of oxygen in the initial combustion zone inhibits fuel NO_x conversion. Radiation of heat from the primary combustion zone results in reduced temperature as the final unburned fuel gases mix with excess air to complete the combustion process. The longer, less intense flames resulting from the staged stoichiometry lower peak flame temperatures and reduce thermal NO_x formation.

Good Work Practices

Good work practices have been described in Section 3.3.1.2.

Step 2 – Technical Feasibility of Control Technologies

Add-on control technologies for reducing NO_x emissions have not been established as BACT or implemented at an existing facility. These add-on control technologies would be technically infeasible for this operation due to the oxygen-rich environment that is present in the baking furnaces.

Low NO_x burners relying on staged air typically achieve NO_x reductions around 50% by using modified air and fuel entry to slow the mixing rate, reduce the oxygen available for NO_x formation in critical NO_x formation zones, and/or reduce the amount of fuel burned at peak flame temperatures. This control technology is technically feasible.

Good work practices have been established as BACT and have been demonstrated as effective at controlling NO_x emissions.

Step 3 – Rank Options by Control Effectiveness

1. Low NO_x burners (0%-50%)
2. Good work practices

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

Low NO_x burners are the top-ranked control technology and will be selected by OA, therefore, no additional analysis is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT for anode baking furnace operations to be use of low NO_x burners and good work practices. The affected units and numeric limits are presented in Table 16.

TABLE 16: ANODE BAKING FURNACES NO_X NUMERIC EMISSION LIMITS

Source ID	Description	NO_x
		lb/hr
230-1	Anode Baking Furnace #1 Baking Fires and FTC	28.1
230-2	Anode Baking Furnace #2 Baking Fires and FTC	28.1

3.3.9 CARBON AREA SERVICES

Baked anodes require additional processing prior to storage and use in the potlines. This includes cleaning and slot cutting and the anode assembly loading and unloading. Spent anodes are also processed in the carbon area, with the anode butts requiring cleaning, breaking via the butt & thimble press, and crushing operation. The cast iron stems that are inserted in the anode to complete the assembly require brushing before insertion, melting via induction furnace, and recycling before reuse.

3.3.9.1 PM/PM_{10}/$PM_{2.5}$ BACT

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing PM/PM_{10}/$PM_{2.5}$ emissions are described below.

Fabric Filter

Described in section 3.3.1.1

Electrostatic Precipitator

Described in section 3.3.1.1

Venturi Scrubber

Described in section 3.3.1.1

Step 2 – Technical Feasibility of Control Technologies

All technologies are technically feasible.

Step 3 – Rank Options by Control Effectiveness

The remaining control technologies are ranked as follows:

1. Fabric Filter Baghouse – 90 - 99%
2. Electrostatic Precipitator - 90 – 99%

3. Venturi Scrubber – 70 – 99%

Step 4 – Evaluate Effectiveness of Controls and Achievability of Emission Limits

OA will be selecting the top-ranked control technology, use of fabric filtration, therefore no further evaluation is required.

Step 5 – Select BACT

Based on the analysis of this section, OA proposes BACT as the use of fabric filtration to achieve an emission limit of 0.005 gr/dscf. The affected sources and numeric emission limits are presented in Table 17 below.

TABLE 17: CARBON AREA SERVICES NUMERIC EMISSION LIMITS

Source ID	Description	PM Emission Factor gr/dscf	PM_{10} Emission Factor gr/dscf	$PM_{2.5}$ Emission Factor gr/dscf
220-1	Anode Cleaning & Slot Cutting	0.005	0.005	0.0025
220-2	Anode Cleaning & Slot Cutting	0.005	0.005	0.0025
240-1	Butt Cleaning	0.005	0.005	0.0025
240-2	Butt Pre-cleaning	0.005	0.005	0.0025
240-4	Butt & Thimble Press	0.005	0.005	0.0025
240-6	Cast Iron Recycling	0.005	0.005	0.0025
240-7	Cast Iron Melting Induction Furnace	0.005	0.005	0.0025
240-8	Stem Brushing	0.005	0.005	0.0025
250-2	Bath Processing Facility	0.005	0.005	0.0025
260-1	Butts Crushing	0.005	0.005	0.0025

3.3.10 MATERIAL HANDLING

Solid raw materials, such as alumina, calcined petroleum coke, fluorinated alumina, and lime will be delivered to the facility via barge or truck. Unloading of the barges will utilize a vacuum suction pipe unloader to transfer the fresh alumina and calcined petroleum coke from the barges to the transport conveyor. Unloading of the lime trucks will utilize a pneumatic system to transfer from the truck to the storage silo. Other materials are unloaded from their transport media into hoppers or similar receiving vessels with limited openings to maximize capture.

Byproduct materials, such as dross, bath, anode butt, and fluorinated alumina are routinely collected and transported throughout the facility for processing or use in production. Emissions from the transported materials occur at the transfer points, not during transport.

These materials are sources of $PM/PM_{10}/PM_{2.5}$, therefore, the control technology analysis will focus on controlling those pollutants.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing $PM/PM_{10}/PM_{2.5}$ emissions from material handling operations are described below.

Baghouse filters

Baghouse filters have been described in Section 3.3.1.1 for fabric filtration.

Electrostatic Precipitator

Electrostatic precipitators have been described in Section 3.3.1.1.

Venturi Scrubber

Venturi scrubbers have been described in Section 3.3.1.1.

Cyclone

Cyclones have been described in Section 3.3.1.1.

Step 2 – Technical Feasibility of Control Technologies

Baghouse filtration and cyclones are technically feasible as they do not change the physical state of the raw and byproduct materials and have been demonstrated as effective in existing facilities – cyclones typically precede additional control technologies like a baghouse.

Electrostatic precipitation is technically feasible but has not been implemented at a primary aluminum smelting facility, particularly for material handling operations.

Venturi scrubbing introduces liquid to achieve effective control, thereby eliminating the reusability of the captured emissions, and thereby making the technology technically infeasible.

Step 3 – Rank Technologies by Control Effectiveness

Baghouse filtration, preceded by a cyclone to treat large particles, is the only remaining control technology and therefore is the top-ranked technology.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

Because baghouse filtration is the only feasible control option, no further analysis is required.

Step 5 – BACT Selection

Based on the analysis of this section, OA proposes BACT material handling to be the use of baghouse control for PM/PM_{10}/$PM_{2.5}$ emissions control to achieve an emission factor of 0.005 gr/dscf. Numeric limits for each proposed material handling source are presented in Table 18 below.

TABLE 18: MATERIAL HANDLING PM/PM_{10}/$PM_{2.5}$ NUMERIC EMISSION LIMITS

Source ID	Description	PM Emission Factor gr/dscf	PM_{10} Emission Factor gr/dscf	$PM_{2.5}$ Emission Factor gr/dscf
240-5	Butt Transfer Car	0.005	0.005	0.0025
250-1	Bath Handling and Storage	0.005	0.005	0.0025
250-3	Cavity Bath Handling	0.005	0.005	0.0025
324-1	Fluorinated Alumina Handling #1	0.005	0.005	0.0025

Source ID	Description	PM Emission Factor gr/dscf	PM_{10} Emission Factor gr/dscf	$PM_{2.5}$ Emission Factor gr/dscf
324-2	Fluorinated Alumina Handling #2	0.005	0.005	0.0025
325-1	Crushed Bath Handling #1	0.005	0.005	0.0025
325-2	Crushed Bath Handling #2	0.005	0.005	0.0025
326-1	Anode cover material, PTM room A1-1	0.005	0.005	0.0025
326-2	Anode cover material, PTM room A1-2	0.005	0.005	0.0025
326-3	Anode cover material, PTM room A2-1	0.005	0.005	0.0025
326-4	Anode cover material, PTM room A2-2	0.005	0.005	0.0025
326-5	Anode cover material, PTM room B1-1	0.005	0.005	0.0025
326-6	Anode cover material, PTM room B1-2	0.005	0.005	0.0025
326-7	Anode cover material, PTM room B2-1	0.005	0.005	0.0025
326-8	Anode cover material, PTM room B2-2	0.005	0.005	0.0025
900-1	Vacuum Barge Unloader Al2O3	0.005	0.005	0.0025
900-2	Vacuum Barge Unloader CPC	0.005	0.005	0.0025
900-3	Raw Material Handling Al2O3	0.005	0.005	0.0025
900-4	Raw Material Handling CPC	0.005	0.005	0.0025

3.3.11 SMALL NATURAL GAS-FIRED HEATERS/BOILERS/FURNACES (<100 MMBTU/HR)

Small, natural gas combustion units are presented in this analysis. While associated with different processes, these units are similarly sized combustion units operating exclusively on natural gas and therefore the control of emissions from these units are identical and presented together. The focus is on minimizing emissions of NOx, PM, SO_2, CO, and VOCs through the application of best available control technologies and practices.

3.3.11.1 PM/PM_{10}/$PM_{2.5}$ BACT

Particulate matter emissions from natural gas-fired heaters primarily result from carryover of non-combustible trace constituents in the fuel. Typically, particulates are hard to detect with natural gas firing due to the low ash content. The USEPA reference AP-42 recommends that all particulate emissions from natural gas combustion are less than 1 micron in aerodynamic diameter, therefore, they are classified as PM/PM_{10}/$PM_{2.5}$.

Step 1 – Identify Potential Control Technologies

Good combustion practices can minimize the potential particulate emissions associated with incomplete combustion. Fabric filtration, ESP, and venturi scrubber control technologies have been described previously in this analysis.

Step 2 – Technical Feasibility of Control Technologies

Good combustion practices are technically feasible and are inherent to operating the heaters in a manner that reduces emissions to atmosphere. The use of pipeline quality natural gas reduces the impurities present in the fuel, which in turn reduces particulate emissions.

Fabric filtration, ESP, and venturi scrubbing are not technically feasible due the high pressure drops and low particulate concentrations associated with the exhaust stream. No entries in the RBLC for small natural gas-fired heaters like these have add-on controls for reducing particulate emissions. The holding furnaces at the Novelis Corporation, RBLC ID KY-0116, are equipped with baghouse controls, however, the potential emissions from OA casting furnaces are less than the controlled emissions from the furnaces at Novelis, therefore, they are excluded as unnecessary to meet BACT.

Step 3 – Rank Technologies by Control Effectiveness

Good combustion practices are the only remaining control technology and therefore the top-ranked control technology.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

Because the top-ranked control technology is selected, no further analysis is required.

Step 5 – BACT Selection

Based on the analysis of this section and a review of the RBLC, OA proposes BACT for these natural-gas fired preheaters and boiler to be good combustion practices and an emission factor of 0.0075 lb PM/PM_{10}/$PM_{2.5}$ /MMBtu. BACT for the casting furnaces is proposed good combustion practices and emission factors of 0.030 lb/ton PM/$PM_{2.5}$ and 0.040 lb/ton PM_{10}. Numeric limits for each proposed small natural gas combustion sources are presented in Table 19 below.

TABLE 19: SMALL NATURAL GAS-FIRED HEATERS/BOILER/FURNACES PM/PM_{10}/$PM_{2.5}$ NUMERIC EMISSION LIMITS

Source ID	Description	PM	PM_{10}	$PM_{2.5}$
344-5	Metal Crucible Preheater	0.0075 lb/MMBtu	0.0075 lb/MMBtu	0.0075 lb/MMBtu
344-6	Bath Crucible Preheater	0.0075 lb/MMBtu	0.0075 lb/MMBtu	0.0075 lb/MMBtu
420-1	Billet Casting Furnace	0.030 lb/ton	0.040 lb/ton	0.030 lb/ton
420-2	PFA Casting Furnace	0.030 lb/ton	0.040 lb/ton	0.030 lb/ton
420-3	Rod Casting Furnace	0.030 lb/ton	0.040 lb/ton	0.030 lb/ton
420-4	Sheet Casting Furnace	0.030 lb/ton	0.040 lb/ton	0.030 lb/ton
430-1	Mold Preheater	0.0075 lb/MMBtu	0.0075 lb/MMBtu	0.0075 lb/MMBtu
210-8	HTM Gas Boiler	0.0075 lb/MMBtu	0.0075 lb/MMBtu	0.0075 lb/MMBtu
211-6	Paste Plant Preheater #1	0.0075 lb/MMBtu	0.0075 lb/MMBtu	0.0075 lb/MMBtu
211-7	Paste Plant Preheater #2	0.0075 lb/MMBtu	0.0075 lb/MMBtu	0.0075 lb/MMBtu
241-10	Stub Hole Preheater	0.0075 lb/MMBtu	0.0075 lb/MMBtu	0.0075 lb/MMBtu

3.3.11.2 NO_X BACT

NO_x emissions from combustion of natural gas-fired heaters results primarily from the thermal NO_x formation mechanism.

Step 1 – Identify Potential Control Technologies

As with other combustion mechanisms, NO_x controls for natural gas-fired heaters can be classified into two types: post-combustion methods and combustion control techniques.

Low-NO_x Burners

Low-NO_x burner technology has been described previously in section 3.3.8.5.

Good Combustion Practices

The use of good combustion practices can minimize the potential NO_x emissions associated with incomplete combustion. Good combustion practices typically entail introducing the proper ratio of combustion air to the fuel, routine and preventative maintenance, and burner and control adjustments.

Selective Catalytic Reduction (SCR)

SCR and its variations were evaluated for NO_x controls of the anode bake furnace and potlines, therefore the full analysis will not be repeated. No sources in the RBLC have proposed use of SCR for these similarly sized natural gas-fired emission units. This control technology is technically infeasible due to either the low temperature range, inconsistent NO_x concentration, temperature, or flow rates, or oxygen-rich environment.

Non-Selective Catalytic Reduction (NSCR)

NSCR and its variations were evaluated for NO_x controls of the anode bake furnace and potlines, therefore the full analysis will not be repeated. No sources in the RBLC have proposed use of NSCR for these similarly sized natural gas-fired emission units.

Selective Non-Catalytic Reduction (SNCR)

SNCR and its variations were evaluated for NO_x controls of the anode bake furnace and potlines, therefore the full analysis will not be repeated. No sources in the RBLC have proposed use of SNCR for these similarly sized natural gas-fired emission units.

Step 2 – Technical Feasibility of Control Technologies

Low NO_x burners relying on staged air typically achieve NO_x reductions around 50% by using modified air and fuel entry to slow the mixing rate, reduce the oxygen available for NO_x formation in critical NO_x formation zones, and/or reduce the amount of fuel burned at peak flame temperatures. This control technology is technically feasible.

By employing good combustion practices, NO_x emissions may be greatly reduced. This control technology is technically feasible.

SCR, NSCR, and SNCR control technologies are technically infeasible due to either the low temperature range, inconsistent NO_x concentration, temperature, or flow rates, or oxygen-rich environment.

Step 3 – Rank Technologies by Control Effectiveness

The remaining technologies to control NO_x emissions are ranked as follows:

- Low-NO_x burners; and
- Good combustion practices.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

Low-NO_x burners are commonly an inherent design feature of modern heaters of these types and have been demonstrated as effective for numerous facilities. Good combustion practices are also inherent to operating the heater in a manner that reduces emissions. Because of the inherent nature and demonstrated effectiveness of these controls, an economic and environmental evaluation will not be performed.

Step 5 – BACT Selection

Based on the analysis of this section and a review of the RBLC, OA proposes BACT for these natural gas-fired preheaters and boiler as the use of low-NO_x burners and good combustion practices to achieve an emission rate of 0.08 lb NO_x/MMBtu. BACT for the casting furnaces is proposed good combustion practices and emission factors of 0.030 lb NO_x/ton. Numeric limits for each proposed small natural gas combustion sources are presented in Table 20 below.

TABLE 20: SMALL NATURAL GAS-FIRED HEATERS/BOILER/FURNACES NOx NUMERIC EMISSION LIMITS

Source ID	Description	NOx
344-5	Metal Crucible Preheater	0.08 lb/MMBtu
344-6	Bath Crucible Preheater	0.08 lb/MMBtu
420-1	Billet Casting Furnace	0.04 lb/ton
420-2	PFA Casting Furnace	0.04 lb/ton
420-3	Rod Casting Furnace	0.04 lb/ton
420-4	Sheet Casting Furnace	0.04 lb/ton
430-1	Mold Preheater	0.08 lb/MMBtu
210-8	HTM Gas Boiler	0.08 lb/MMBtu
211-6	Paste Plant Preheater #1	0.08 lb/MMBtu
211-7	Paste Plant Preheater #2	0.08 lb/MMBtu
241-10	Stub Hole Preheater	0.08 lb/MMBtu

3.3.11.3 SO_2 BACT

SO_2 emissions from the natural gas-fired heaters results primarily from the oxidation of 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. As with other combustion processes, 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.

Step 1 – Identify Potential Control Technologies

The technologies that are potentially available to control SO_2 emissions are related to the sulfur content in the fuel and scrubbing the exhaust gas to remove the SO_2.

- Clean Fuel and Good Combustion Practices; and
- Wet Scrubbing.

Step 2 – Technical Feasibility of Control Technologies

For relatively small natural gas-fired sources, post-combustion controls, such as wet scrubbers, 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. Use of clean fuel, such as natural gas, good combustion practices, and use of pipeline quality natural gas are technically feasible.

Step 3 – Rank Technologies by Control Effectiveness

Only one control technology was determined to be technically feasible, therefore, it is the top-ranked control technology.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

OA is selecting the top-ranked control technology, therefore no further evaluation is required.

Step 5 – BACT Selection

Based on the analysis of this section and a review of the RBLC, OA proposes BACT for controlling SO_2 from the natural-gas fired preheaters and boiler as good combustion practices and use of natural gas to achieve a numerical limit of 0.0006 lb/MMBtu. BACT for the casting furnaces is proposed good combustion practices and emission factors of 0.0028 lb/ton. Good combustion practices include burner maintenance and proper operation. Numeric limits for each proposed small natural gas combustion sources are presented in Table 21 below.

TABLE 21: SMALL NATURAL GAS-FIRED HEATERS/BOILER/FURNACES SO_2 NUMERIC EMISSION LIMITS

Source ID	Description	SO_2
344-5	Metal Crucible Preheater	0.0006 lb/MMBtu
344-6	Bath Crucible Preheater	0.0006 lb/MMBtu
420-1	Billet Casting Furnace	0.0028 lb/ton
420-2	PFA Casting Furnace	0.0028 lb/ton
420-3	Rod Casting Furnace	0.0028 lb/ton
420-4	Sheet Casting Furnace	0.0028 lb/ton
430-1	Mold Preheater	0.0006 lb/MMBtu
210-8	HTM Gas Boiler	0.0006 lb/MMBtu
211-6	Paste Plant Preheater #1	0.0006 lb/MMBtu
211-7	Paste Plant Preheater #2	0.0006 lb/MMBtu
241-10	Stub Hole Preheater	0.0006 lb/MMBtu

3.3.11.4 CO AND VOC BACT

CO and VOC emissions from the natural gas-fired heaters result from incomplete combustion caused when some of the fuel is not completely burned or is only partially burned. The control of CO and VOC emissions are most directly associated with add-on combustion or oxidation systems.

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing CO and VOC emissions are described below.

Good Combustion Practices

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, routine and preventative maintenance, and burner and control adjustments.

Flaring of CO and VOC Emissions

Based upon a review of the previously listed information resources, there is no known application of flaring small natural gas-fired heaters. Flaring of emissions for CO destruction would require raising the exhaust gas temperature to 1,300 °F at a residence time of 0.5 second. VOC destruction would require raising the exhaust gas temperature to 1,400 °F. The exhaust from preheaters can range in temperature from 500 °F to 1,800 °F, either requiring significant supplemental fuel combustion or achieving destruction temperature in its own exhaust.

Oxidation Catalysts

Based upon a review of the previously listed information resources, there is no known application of oxidation catalysts for small natural gas-fired heaters. Oxidation catalysts offer an effective means of controlling carbon monoxide (CO) and volatile organic compound (VOC) emissions. These catalysts facilitate the conversion of CO and VOCs into carbon dioxide and water at relatively low exhaust temperatures, typically between 300°F and 700°F (150°C to 370°C), making them well-suited for space heaters. They can achieve emission reduction efficiencies of 80–95%, depending on operating conditions and catalyst formulation. However, maintenance is a critical consideration for sustained performance. Oxidation catalysts require periodic inspection and cleaning to prevent fouling from particulates or sulfur compounds, and may need replacement every 2–5 years depending on usage and exposure. Ensuring proper exhaust temperature and avoiding thermal shock are also essential to maintain catalyst integrity and effectiveness.

Catalytic Incineration

Based upon a review of the previously listed information resources, there is no known application of catalytic incineration for small natural gas-fired heaters. This method uses a catalyst to lower the activation energy required for oxidation, allowing CO and VOCs to be converted into carbon dioxide and water at relatively low temperatures—typically between 500°F and 800°F (260°C to 425°C). Catalytic incineration is particularly effective for steady, low-concentration emission streams typical of space heaters, achieving destruction efficiencies of up to 95%. Maintenance is essential to ensure long-term performance: catalysts must be protected from fouling by particulates, sulfur compounds, and high-temperature excursions. Regular inspections, periodic cleaning, and replacement every 3–5 years are recommended, depending on operating conditions.

Step 2 – Technical Feasibility of Control Technologies

By employing good combustion practices, CO and VOC emissions may be greatly reduced. This control technology is technically feasible.

Flaring of CO and VOC emissions from small natural gas-fired heaters has not been proposed or implemented. The exhaust temperatures of these heaters are either above the typical destruction temperature or well below, making the additional heat input unnecessary or significant. This technology is technically infeasible due to its redundancy or high additional heat input demands.

Oxidation catalysts to control CO and VOC emissions from small natural gas-fired heaters have not been proposed or implemented. Preheaters operate on an as-needed basis, and therefore, have periods of downtime between uses. This operating schedule would subject the catalysts to rapid heating followed by cooling cycles which would rapidly degrade the effectiveness of the catalysts. For space heaters, the exhaust temperatures are set to human comfort and therefore are too low for effective control. For this reason, oxidation catalysts are technically infeasible.

Oxidation catalysts to control CO and VOC emissions from small natural gas-fired heaters have not been proposed or implemented. As described for the use of oxidation catalysts, the operating schedule of the preheaters is such that temperature excursions are inevitable, which would quickly degrade the catalysts. For this reason, oxidation catalysts are technically infeasible.

Step 3 – Rank Technologies by Control Effectiveness

Only one control technology was determined to be technically feasible, therefore, it is the top-ranked control technology.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

OA is selecting the top-ranked control technology, therefore no further evaluation is required.

Step 5 – BACT Selection

Based on the analysis of this section and a review of the RBLC, OA proposes BACT for controlling CO and VOC from the natural-gas fired preheaters and boiler as good combustion practices and use of natural gas to achieve a numerical limit of 0.082 lb/MMBtu and 0.0054 lb/MMBtu for CO and VOC respectively. BACT for the casting furnaces is proposed good combustion practices and emission factors of 0.060 lb/ton and 0.030 lb/ton for CO and VOC respectively. Good combustion practices include burner maintenance and proper operation. Numeric limits for each proposed small natural gas combustion sources are presented in Table 22 below.

TABLE 22: SMALL NATURAL GAS-FIRED HEATERS/BOILER CO AND VOC NUMERIC EMISSION LIMITS

Source ID	Description	CO	VOC
			lb/MMBtu
344-5	Metal Crucible Preheater	0.082 lb/MMBtu	0.0054 lb/MMBtu
344-6	Bath Crucible Preheater	0.082 lb/MMBtu	0.0054 lb/MMBtu
420-1	Billet Casting Furnace	0.060 lb/ton	0.030 lb/ton
420-2	PFA Casting Furnace	0.060 lb/ton	0.030 lb/ton
420-3	Rod Casting Furnace	0.060 lb/ton	0.030 lb/ton
420-4	Sheet Casting Furnace	0.060 lb/ton	0.030 lb/ton
430-1	Mold Preheater	0.082 lb/MMBtu	0.0054 lb/MMBtu
210-8	HTM Gas Boiler	0.082 lb/MMBtu	0.0054 lb/MMBtu
211-6	Paste Plant Preheater #1	0.082 lb/MMBtu	0.0054 lb/MMBtu
211-7	Paste Plant Preheater #2	0.082 lb/MMBtu	0.0054 lb/MMBtu
241-10	Stub Hole Preheater	0.082 lb/MMBtu	0.0054 lb/MMBtu

3.3.11.5 GHG BACT

GHG emissions from the various heaters will result from the combustion of natural gas. In these heaters, nearly all of the fuel carbon in natural gas is converted to CO_2 during the combustion process. Thus, the following control analysis focuses on CO_2 emissions.

Step 1 – Identify Potential Control Technologies

Use of low-carbon fuels

The use of low carbon fuels will lower the amount of elemental carbon available to combine with oxygen in the combustion sources, thereby minimizing CO_2 emissions. Natural gas is composed primarily of methane (typically 95% or greater), ethane (typically 2.5%), propane (typically 0.2%) and trace amounts of longer chain hydrocarbons. As a result, natural gas combustion produces the lowest CO_2 emissions per unit of energy delivered when compared to other fossil fuels such as fuel oil or coal. The use of low carbon fuel (natural gas) is considered feasible for the heaters.

Energy Efficient Design

Thermal efficiency is an emissions reduction strategy focused on increasing energy efficiency. Higher thermal efficiency means less natural gas is required to achieve the required temperatures.

Carbon Capture and Sequestration

Carbon capture and sequestration (CCS) makes use of specialized equipment to extract CO_2 from the exhaust stream and is eventually injected underground for storage.

Step 2 – Technical Feasibility of Control Technologies

Use of low-carbon fuels

The use of low carbon fuel (natural gas) is considered feasible for the heaters.

Energy Efficient Design

An energy efficient design is considered technically feasible for the heaters.

Carbon Capture and Sequestration

As described previously, a suitable commercial location for sequestering GHG emissions is still in the planning phase and therefore is technically infeasible.

Step 3 – Rank Technologies by Control Effectiveness

Low carbon fuels and energy efficient designs are both ranked equally as the most effective control technology.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

Due to these options being technically feasible and part of the heaters' design, no environmental or economic analysis is required.

Step 5 – BACT Selection

Based on the analysis of this section, OA proposes BACT for GHGs as low carbon fuels and energy efficient design. Numeric limits for the combined small natural gas combustion sources are presented in Table 23 below.

TABLE 23: SMALL NATURAL GAS-FIRED HEATERS/BOILER GHG NUMERIC EMISSION LIMITS

Source ID	Description	Total CO_2e tpy
344-5	Metal Crucible Preheater	1937.1
344-6	Bath Crucible Preheater	
420-1	Billet Casting Furnace	
420-2	PFA Casting Furnace	
420-3	Rod Casting Furnace	
420-4	Sheet Casting Furnace	
430-1	Mold Preheater	
210-8	HTM Gas Boiler	
211-6	Paste Plant Preheater #1	
211-7	Paste Plant Preheater #2	
241-10	Stub Hole Preheater	

3.3.12 SHOT BLASTING OPERATIONS

To clean or repair various components through the facility, shot blasting is used to remove surface material. Shot blasting involves the propellent of an abrasive such as sand or small metallic materials, known as shot, at a surface to dislodge buildup of unwanted materials. At the proposed facility, this type of operation is associated with butt shot blasting operation (0240-3) and stub shot blasting operation (240-9) and will be performed indoors. These sources emit $PM/PM_{10}/PM_{2.5.}$

Step 1 – Identify Potential Control Technologies

Potentially applicable control technologies for reducing $PM/PM_{10}/PM_{2.5}$ emissions from shot blasting operations are described below.

Baghouse/fabric filters

Baghouse filters have been described in Section 3.3.1.1 for fabric filtration.

Electrostatic Precipitator

Electrostatic precipitators have been described in Section 3.3.1.1.

Venturi Scrubber

Venturi scrubbers have been described in Section 3.3.1.1.

Cyclone

Cyclones have been described in Section 3.3.1.1.

Step 2 – Technical Feasibility of Control Technologies

Baghouse filtration, typically preceded by a cyclone, has been implemented at similar facilities in the metals industry. It is capable of handling the operational cycle of the shot blasting operations and the particulate types and therefore is technically feasible.

Electrostatic precipitators and venturi scrubbers have not been implemented at similar facilities or for this source type. The size and nature (large, dense, and abrasive particles) will be heavier than the typical types of particles controlled by an electrostatic precipitator. Venturi scrubbers introduce a liquid to the control mechanism, which can cause agglomeration of the large particles and result in the clogging of the scrubber. These two technologies are deemed technically infeasible.

Step 3 – Rank Technologies by Control Effectiveness

Baghouse filtration, preceded by a cyclone to treat large particles, is the only remaining control technology and therefore is the top-ranked technology.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

Because baghouse filtration is the only feasible control option, no further analysis is required.

Step 5 – BACT Selection

Based on the analysis of this section, OA proposes BACT for shot blasting operations to be baghouse filtration achieving an emission limit of 0.003 gr/dscf. This grain loading meets the established BACT emission limit for abrasive blasting. Numeric limits for each proposed shot blasting operation are presented in Table 24 below.

TABLE 24: SHOT BLASTING PM/PM_{10}/$PM_{2.5}$ NUMERIC EMISSION LIMITS

Source ID	Description	PM/PM_{10}/$PM_{2.5}$ Emission Factor
		gr/dscf
0240-3	Butt Shot Blasting	0.003
0240-9	Stub Shot Blasting	0.003
342-1	Potshell Repair Blasting	0.003

3.3.13 PAVED ROADWAYS

Vehicles, including team member vehicles, raw material transport, final product shipping trucks, molten metal transport vehicles, and material handling loaders, will generate fugitive $PM/PM_{10}/PM_{2.5}$ emissions as they travel over paved roadway surfaces at the Facility. Whether a roadway is paved or unpaved is influenced by the vehicle and type of activity occurring on the roadway.

Step 1 – Identify Potential Control Technologies

Permanent Surface Improvement

Surface improvements can be used to permanently alter the road surface of unpaved roads in order to reduce particulate emissions, depending on the weight of the vehicles travelling on the road. Regular maintenance and repair is necessary to keep the roadway surface in good operation condition.

Good Housekeeping Practices

Good housekeeping practices include maintaining the road in good condition, speed reductions on all roadways, and sweeping paved roads in accordance with a facility’s fugitive dust management plan.

Step 2 – Technical Feasibility of Control Technologies

All control technologies identified in Step 1 are technically feasible, as long as the travel path is compatible with the vehicle weight and travel frequency.

Step 3 – Rank Technologies by Control Effectiveness

The potential control technologies are ranked as follows:

1. Good Housekeeping Practices
2. Permanent Surface Improvement

Good housekeeping practices were selected as the top-ranked control technology. While a paved road does control emissions over an unpaved road, the housekeeping practices are necessary to maintain the reductions of the paved road versus the unpaved road. When combined, the two technologies result in very effective emission control.

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

OA is selecting the two top-ranked control technologies and therefore no further analysis is required.

Step 5 – BACT Selection

Based on the review of the RBLC for similar activities, BACT for $PM/PM_{10}/PM_{2.5}$ is proposed as good housekeeping practices. These good housekeeping practices will be in the form of a fugitive dust management plan that identifies the conditions requiring implementation of vacuuming on the paved roadways. The plan also includes recordkeeping practices for demonstrating compliance with the fugitive dust plan. The affected roadway IDs are . The numeric emission limits are .

3.3.14 EMERGENCY GENERATORS

The BACT analysis for emergency generators focuses on minimizing emissions of key pollutants such as CO_2e, CO, NO_x, PM (PM, PM_{10}, $PM_{2.5}$), SO_2, VOCs, and visible emissions (VE). The analysis includes both large and small diesel-fired emergency generators proposed at the facility. As the control technologies to reduce emissions affect all pollutants, the analysis will combine all criteria pollutants and CO_2e. The emergency generator engines are proposed as Tier 4 engines.

Step 1 – Identify Potential Control Technologies

Potentially applicable controls for reducing emissions from diesel-fired emergency generators are described below.

Energy Efficient Design

The diesel-fired emergency generator engine will be certified to meet the required US EPA emission standards based on the engine's model year and size. In order to achieve this certification, the engine is optimized to perform at its best design capacity and maximum efficiency. Criteria pollutants from engines can be controlled by particulate filtration, selective catalytic reduction, and oxidation catalyst in certain scenarios.

Limited Operation

Limiting the potential hours of operation directly reduces the potential annual emissions from a source.

Fuel Selection

Criteria pollutant emissions can be minimized through combustion of fuels with minimal amounts of impurities.

Low-Carbon Fuel - Using fuels containing lower concentrations of carbon generates less VOC/CO than other higher carbon fuels. Typically, gaseous fuels such as natural gas contain less carbon, and thus lower VOC/CO potential emissions than liquid or solid fuels such as diesel or coal.

Low-Sulfur Fuel – Combustion of low-sulfur fuel, such as natural gas, treated refinery gas, or propane, has the potential to reduce the formation of SO_2; thus also has the potential to reduce the formation of condensable particulate.

Good Combustion Practices, Good Operating and Maintenance Practices

Good combustion, operating, and maintenance practices for compression ignition engines include appropriate maintenance of equipment (periodic testing will be conducted weekly) and operating within the recommended air to fuel ratio recommended by the manufacturer. Using good combustion practices, in conjunction with proper maintenance, results in longer life of the equipment and more efficient operation. Therefore, such practices indirectly reduce emissions generated from combustion by supporting operation as designed and with consideration of other energy optimization practices.

Step 2 – Technical Feasibility of Control Technologies

Because the emergency generator is intended for emergency use, the most technically feasible fuel for the emergency generator engine is diesel fuel. While natural gas-fueled generator engine may provide lower criteria pollutant emissions per unit of power output, diesel-fired emergency generators have been recently permitted as BACT.

Since these generators are limited to emergency use, the emissions of criteria pollutants are minimal. As a result of the minimal emissions and limited periods of operation, add-on control devices, such as particulate filters, oxidation catalysts, and selective catalytic reduction, would not be feasible for these emergency sources. Further, due to the rapid startup and shutdown periods, the exhaust temperature of the engine is not appropriate for catalyst control.

Step 3 – Rank Technologies by Control Effectiveness

The potential control technologies are ranked as follows:

1. Energy Efficient Design
2. Limited Operation
3. Good Combustion Practices
4. Fuel Selection

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

The potential control technologies in Step 3 are all effective means to control emissions and have been successfully implemented at several facilities in the metals industry. These technologies and practices will be implemented concurrently to maximize the emission reductions. Diesel will be the selected fuel for the generators, with the use of ultra-low sulfur diesel with a maximum sulfur content of 15 ppm to control sulfur emissions.

Step 5 – BACT Selection

For emissions of PM/PM_{10}/$PM_{2.5}$, NOx, CO, VOC, and SO_2 generated by combustion, OA proposes as limited operation for maintenance and readiness testing; efficient engine design; implementation of good combustion practices; and good operating and maintenance practices. Further, this new emergency generator engine will be subject to 40 CFR 60 Subpart IIII, the NSPS for Stationary Compression Ignition Internal Combustion Engines. Operation of the emergency generator for purposes of maintenance checks and readiness testing will be limited to 100 hours per year. Additionally, the emergency generator engine will combust only ultra-low sulfur diesel fuel (15 ppm sulfur) to limit emissions of SO_2, a $PM_{2.5}$ precursor. Numerical BACT limits for each affected engine are presented in the table below.

TABLE 25: DIESEL-FIRED EMERGENCY GENERATOR NUMERIC EMISSION LIMITS

Source ID	Description	$PM/PM_{10}/PM_{2.5}$	NOx	CO	VOC	SO_2	CO_2e
315-1	>2 MW emergency generator	0.2 g/kW-hr	6.4 g/kW-hr	3.5 g/kW-hr	6.4 g/kW-hr	15 ppm Sulfur	279.1 ton/year
315-2	≤ 150 kW emergency generator	0.2 g/kW-hr	6.6 g/kW-hr	3.5 g/kW-hr	6.6 g/kW-hr	15 ppm Sulfur	20.94 ton/year

3.3.15 COOLING TOWERS

Cooling towers emit particulate matter (PM, PM_{10}, $PM_{2.5}$) primarily through drift—water droplets containing dissolved solids that escape into the atmosphere. The BACT analysis aims to minimize these emissions using the most effective and feasible technologies.

Step 1 – Identify Potential Control Technologies

Potentially applicable controls for reducing fugitive emissions from cooling towers are described below.

High Efficiency Drift Eliminators (HDEs)

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 reduce PM, PM_{10}, and $PM_{2.5}$ emissions.

Step 2 – Technical Feasibility of Control Technologies

All proposed controls in Step 1 are technically feasible.

Step 3 – Rank Technologies by Control Effectiveness

The potential control technologies are ranked as follows:

1. HDE, as low as 0.001% of circulating flow
2. Proper equipment design and operation and good maintenance practices

Step 4 – Evaluate Effectiveness of Control Technologies and Achievability of Emission Limits

OA proposes to accept the top-ranked control technology of HDEs, therefore no further analysis is required.

Step 5 – BACT Selection

Based on the review of the RBLC for similar activities, BACT for $PM/PM_{10}/PM_{2.5}$ is proposed as the use of a HDE, capable of meeting a drift rate of 0.001%. The affected source IDs include: 450 (Casthouse Cooling Water and Treatment Towers), 213 (Green Anode Cooling Towers), 430-3 (Mold Water Cooling Systems), and 241-13 (Carbon area cooling T.

APPENDIX A: RBLC DATA TABLES

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
IN-0359	NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN1)	CO2e	Good engineering design and manufacturer's recommended operating and maintenance procedures.	163	LB/MMBTU	BACT-PSD
				CO	Oxidation catalyst and certified engine	2.61	G/HP-H	BACT-PSD
				NOX	Certified engine	4.8	G/HP-H	BACT-PSD
				TPM	Certified engine	0.15	G/HP-H	BACT-PSD
				TPM10	Certified engine	0.15	G/HP-H	BACT-PSD
				TPM2.5	Certified engine	0.15	G/HP-H	BACT-PSD
				SO2	Ultra-low sulfur diesel fuel (0.0015%S)	0	N/A	BACT-PSD
				VOC	Certified engine	0.32	G/HP-H	BACT-PSD
AR-0180	HYBAR LLC	4/8/2023	Emergency Generators	CO2e	Good combustion practices	164.0	LB/MMBTU	BACT-PSD
				CO	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.9	G/HP-H	BACT-PSD
				NOX	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	3.9	G/HP-H	BACT-PSD
				TPM	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.1	G/HP-H	BACT-PSD
				TPM10	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.1	G/HP-H	BACT-PSD
				TPM2.5	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.1	G/HP-H	BACT-PSD
				SO2	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	15	PPM MAX FUEL CONTENT	BACT-PSD
AR-0177	NUCOR STEEL	11/21/2022	SN-230 Galvanizing Line No, 2 Emergency Generator	CO2e	NONE LISTED	163	LB/MMBTU	BACT-PSD
				CO	NONE LISTED	3.5	G/KW-HR	BACT-PSD
				NOX	NONE LISTED	5.6	G/KW-HR	BACT-PSD
				FPM	NONE LISTED	0.2	G/KW-HR	BACT-PSD
				TPM10	NONE LISTED	0.2	G/KW-HR	BACT-PSD
				TPM2.5	NONE LISTED	0.2	G/KW-HR	BACT-PSD
				SO2	Fuel Specification	15	PPM FUEL	BACT-PSD
				VE	NONE LISTED	20	% OPACITY	BACT-PSD
				VOC	NONE LISTED	0.8	G/KW-HR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	Tunnel Furnace Emergency Generator (EP 08-06)	CO	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				NOX	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				FPM	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM10	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM2.5	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
			Caster B Emergency Generator (EP 08-07)	CO	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.0	N/A	BACT-PSD
				NOX	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				FPM	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM10	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM2.5	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
			New Pumphouse (XB13) Emergency Generator #1 (EP 08-05)	CO	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				NOX	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				FPM	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM10	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM2.5	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
			Air Separation Unit Emergency Generator (EP 08-08)	CO	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				NOX	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				FPM	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM10	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM2.5	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
			EP 10-07 - Air Separation Plant Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0110	NUCOR NUCOR STEEL BRANDENBURG	7/23/2020	EP 10-04 - Emergency Fire Water Pump	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
			EP 10-02 - North Water System Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
			EP 10-01 - Caster Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
			EP 10-03 - South Water System Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	4.77	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
OH-0376	IRONUNITS LLC - TOLEDO HBI	2/9/2018	Emergency diesel-fired generator (P007)	CO2e	Equipment design and maintenance requirements	163.6	LB/MMBTU	BACT-PSD
				CO	Comply with NSPS 40 CFR 60 Subpart IIII	15.4	LB/H	BACT-PSD
				NOX	Comply with NSPS 40 CFR 60 Subpart IIII	28.2	LB/H	BACT-PSD
				TPM10	Comply with NSPS 40 CFR 60 Subpart IIII	1.01	LB/H	BACT-PSD
				TPM2.5	Comply with NSPS 40 CFR 60 Subpart IIII	1.01	LB/H	BACT-PSD
				VE	Comply with NSPS 40 CFR 60 Subpart IIII	0	N/A	N/A

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
AR-0180	HYBAR LLC	4/28/2023	Emergency Water Pumps	CO2e	Good combustion practices	164	LB/MMBTU	BACT-PSD
				CO	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	3.03	G/BHP-H	BACT-PSD
				NOX	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	14.06	G/BHP-H	BACT-PSD
				TPM	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	1	G/BHP-H	BACT-PSD
				TPM10	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	1	G/BHP-H	BACT-PSD
				TPM2.5	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	1	G/BHP-H	BACT-PSD
				SO2	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	15	PPM MAX FUEL CONTENT	BACT-PSD
IN-0359	NUCOR STEEL	3/30/2023	Emergency Generator (CC-GEN2)	CO2e	Good engineering design and manufacturer's recommended operating and maintenance procedures.	163.6	LB/MMBTU	BACT-PSD
				CO	Oxidation catalyst and certified engine	2.61	G/BHP-H	BACT-PSD
				NOX	Certified engine	3	G/BHP-H	BACT-PSD
				TPM	Certified engine	0.15	G/BHP-H	BACT-PSD
				TPM10	Certified engine	0.15	G/BHP-H	BACT-PSD
				TPM2.5	Certified engine	0.15	G/BHP-H	BACT-PSD
				SO2	Ultra-low sulfur diesel fuel (0.0015%S)	0	N/A	BACT-PSD
				VOC	Certified engine	1.13	G/BHP-H	BACT-PSD
			P010 - 225 Hp Diesel engine for bulk material screen	CO2e	Good combustion practices	1,209.0	T/YR	BACT-PSD
				CO	Good combustion practices to meet Tier IV emissions	1.29	LB/H	BACT-PSD
				NOX	Good combustion practices to meet Tier IV emissions	0.15	LB/H	BACT-PSD
				TPM10	Good combustion practices to meet Tier IV emissions	0.02	LB/H	BACT-PSD
				TPM2.5	Good combustion practices to meet Tier IV emissions	0.02	LB/H	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
OH-0388	IRON UNITS LLC	12/22/2022	P011 and P013 - 100 Hp Diesel Engine	CO2e	Good combustion practices	539	T/YR	BACT-PSD
				CO	Good combustion practices to meet Tier IV emissions	0.83	LB/H	BACT-PSD
				NOX	Good combustion practices to meet Tier IV emissions	0.07	LB/H	BACT-PSD
				TPM10	Good combustion practices to meet Tier IV emissions	0.01	LB/H	BACT-PSD
				TPM2.5	Good combustion practices to meet Tier IV emissions	0.01	LB/H	BACT-PSD
			P012 - 125 Hp Diesel Engine for Screen Bypass Screen	CO2e	Good combustion practices	65	T/YR	BACT-PSD
				CO	Good combustion practices to meet Tier IV emissions	1.03	LB/H	BACT-PSD
				NOX	Good combustion practices to meet Tier IV emissions	0.08	LB/H	BACT-PSD
				TPM10	Good combustion practices to meet Tier IV emissions	0.01	LB/H	BACT-PSD
				TPM2.5	Good combustion practices to meet Tier IV	0.01	LB/H	BACT-PSD
KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	Cold Mill Complex Emergency Generator (EP 09-05)	CO	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				NOX	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0	N/A	BACT-PSD
				FPM	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM10	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
				TPM2.5	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.15	G/HP-H	BACT-PSD
AR-0168	BIG RIVER STEEL LLC	3/17/2021	Emergency Engines	CO2	Good combustion practices	163	LB/MMBTU	BACT-PSD
				CO	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	3.5	G/KW-HR	BACT-PSD
				CH4	Good combustion practices	0.0061	LB/MMBTU	BACT-PSD
				NOX	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	4.86	G/KW-HR	BACT-PSD
				N2O	Good combustion practices	0.0013	LB/MMBTU	BACT-PSD
				TPM	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.2	G/KW-HR	BACT-PSD
				TPM10	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.2	G/KW-HR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
				TPM2.5	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.2	G/KW-HR	BACT-PSD
				SO2	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	0.0015	SULFUR FUEL	BACT-PSD
				VE	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	20	% OPACITY	BACT-PSD
				VOC	Good Operating Practices, limited hours of operation, Compliance with NSPS Subpart IIII	1.55	G/KW-HR	BACT-PSD
			EP 11-03 - Rolling Mill Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
			EP 11-04 - IT Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 11-02 - Reheat Furnace Emergency	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
			EP 11-05 - Radio Tower Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				SO2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
			EP 11-01 - Melt Shop Emergency Generator	CO2e	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				CO	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.61	G/HP-H	BACT-PSD
				NOX	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	2.98	G/HP-H	BACT-PSD
				FPM	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM10	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD
				TPM2.5	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0.15	G/HP-H	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
				SO_2	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD
				VOC	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.	0	N/A	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
SC-0198	CENTURY ALUMINUM OF SOUTH CARO	1/15/2020	ANODE BAKE FURNACE	NOX	GOOD OPERATING PRACTICES	18.16	LB/H	BACT-PSD
KY-0099	RIO TINTO ALCAN-SEBREE WORKS	8/19/2010	3 POTLINES	CO	GOOD COMBUSTION CONTROLS	233.6	LB/T	BACT-PSD
				FPM10	DRY ALUMINA SCRUBBER/BAGHOUSE	2.1	LB/T	BACT-PSD
				PM	DRY ALUMINA SCRUBBER/BAGHOUSE	4.88	LB/T	BACT-PSD
				TRS	DRY ALUMINA SCRUBBER/BAGHOUSE	1.9	LB/T	BACT-PSD
SC-0146	ALCOA - MT. HOLLY (OPERATING A	11/19/2002	PRIMARY ALUMINUM ORE REDUCTION	CO	NONE LISTED	0	N/A	BACT-PSD
				FLUORIDES, TOTAL	DRY ALUMINA INJECTION	0.04	LB/TON	BACT-PSD
				PB	BAGHOUSE, BEST MANAGEMENT PRACTICES	0	N/A	BACT-PSD
				NOX	NONE LISTED	0	N/A	BACT-PSD
				TPM	BAGHOUSE, NATURAL GAS AS PRIMARY FUEL/PROPANE AS BACK-UP FUEL, BEST MANAGEMENT PRACTICES	0.005	GR/DSCF	BACT-PSD
				TPM10	BAGHOUSE, NATURAL GAS AS PRIMARY FUEL/PROPANE AS BACK-UP FUEL, BEST MANAGEMENT PRACTICES	0	N/A	BACT-PSD
				VE	BAGHOUSE	10	% OPACITY	BACT-PSD
KY-0070	NSA-A DIVISION OF SOUTHWIRE CO	05/29/1998	POTLINE 5	SO2	SCRUBBER, PERFORMANCE TESTING. RECORDS OF SULFUR CONTENTS BY WEIGHT OF THE PETROLEUM COKE, COAL TAR PITCH, AND GREEN ANODE MIX. RECORDS OF ANODE CONSUMPTION AND AMOUNT OF ALUMINUM PRODUCED	7.44 (Roof Monitor) 25.51 (Stack)	LB/H	BACT-PSD
				CO	INSPECT & RECORD CONDITIONS OF POTS & QUICKLY REPAIR DAMAGES. PERFORMANCE TESTING. RECORD PRODUCTION RATES OF ANODES, RAW MATERIAL FEED RATES, & CELL OR POTLINE VOLTAGE. BAGHOUSE.	432.56 57.413	LB/H LB/TON	Other Case-by-Case
				PM	VISIBLE EMISSIONS READINGS. IF READINGS DURING 3 CONSECUTIVE MOS DEMONSTRATE OPACITIES ARE <75% OF STANDARD, READINGS SHALL BE PERFORMED 1/MO. DRY ALUMINA SCRUBBER, BAGHOUSE.	15.07 (Roof Monitor) 13.71 (Stack)	LB/H	Other Case-by-Case
				VOC	RECORDS OF VOM CONTENTS OF COAL TAR PITCH AND PETROLEUM COKE. DRY ALUMINA SCRUBBER SYSTEM. PERFORM COMPLIANCE TESTS.	8.29	LB/H	BACT-PSD
				CO	FUEL RESTRICTIONS- THERE IS AN OPERATION LIMIT OF 56 MMCF NATURAL GAS FOR THE EXISTING UNIT AND 19 MMCF NATURAL GAS FOR THE NEW UNIT. RECORDS OF FUEL USAGE RATES OF NATURAL GAS AND PROPANE AND FURNACE TEMP SHALL BE MAINTAINED.	2.68 0.035	LB/H LB/MMBTU	BACT-PSD
				Hydrogen Fluoride	SCRUBBER AND BAGHOUSE	0.64	LB/H	N/A
				NOX	FUEL RESTRICTION, SCRUBBER, AND BAGHOUSE. SCRUBBER, BAGHOUSE, RECORD FUEL USAGE RATES OF NATURAL GAS AND PROPANE AND FURNACE TEMPERATURE. RECORDS FOR MODIFIED AND NEW CARBON BAKE FURNACE SHALL BE KEPT SEPARATELY.	47 0.140	T/YR LB/MMBTU	Other Case-by-Case

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
			CARBON BAKE FURNACE	FPM10	WEEKDAY DAILY VE READINGS. IF 3 CONSECUTIVE MOS OF OPERATION DEMONSTRATE THAT OPACITIES ARE <75% OF STANDARD, READINGS SHALL BE 1/MO. DRY ALUMINA SCRUBBER, BAGHOUSE, GOOD PRACTICES.	3.16	LB/H	Other Case-by-Case
				SO2	PERCENT LIMITS BY WEIGHT OF SULFUR IN COAL TAR PITCH, PETROLEUM COKE, AND GREEN ANODE MIX. ANNUAL AND INITIAL PERFORMANCIE TESTING. DIVISION RESERVES THE RIGHT TO REQUIRE THE INSTALLATION OF CEMS. ANNUAL PERFORMANCE TESTS SHALL BE CONDUCTED FOR SO2.	110.22	LB/H	BACT-PSD
				VOC	LOW VOM COAL, FUEL. MAINTAIN RECORDS OF VOM CONTENTS OF COAL TAR PITCH AND PETROLEUM COKE. VOM CONTENTS SHALL NOT EXCEED THOSE DETERMINED IN PERFORMANCE TESTS.	3.83	LB/H	BACT-PSD
			BALLMILL	FPM10	NONE LISTED	0.26	LB/H	Other Case-by-Case
				VE	NONE LISTED	20	% OPACITY	Other Case-by-Case
			ALUMINA HANDLING SYSTEM	FPM10	CEM, LIMITS	0.32	LB/H	Other Case-by-Case
				VE	NONE LISTED	20	% OPACITY	Other Case-by-Case
			6 ALUMINA STORAGE FACILITIES	FPM10	FABRIC FILTER	0.0597	LB/H	Other Case-by-Case
				VE	NONE LISTED	20	% OPACITY	Other Case-by-Case
			COOLING TOWER	FPM10	REASONABLE POLLUTION PRECAUTIONS.	0.29	LB/H	Other Case-by-Case
SC-0037	ALUMAX OF SOUTH CAROLINA	8/30/1995	ANODE BAKE PLANT	CO	NONE LISTED	89.4	LB/H	Other Case-by-Case
				FLUORIDES, TOTAL	DRY ALUMINA SCRUBBING (EXISTING CONTROLS MET BACT REQUIREMENTS)	0.04	LB/T EQUIVALENT AL	BACT-PSD
				NOX	NONE LISTED	9	LB/H	Other Case-by-Case
				PM	NONE LISTED	4.8	LB/H	Other Case-by-Case
				SO2	LIMIT MAX % SULFUR OF ANODE COKE TO 2.95% LIMIT MAX % SULFUR OF ANODE PITCH TO 1.2%	85.5	LB/H	BACT-PSD
				VE	NONE LISTED	20	% OPACITY	Other Case-by-Case
			POTROOM GROUPS (4)	CO	NONE LISTED	1840	LB/H	Other Case-by-Case
				FLUORIDES, TOTAL	DRY ALUMINA SCRUBBING (EXISTING CONTROLS MET BACT REQUIREMENTS)	1.02	LB/T OF CAST AL	BACT-PSD
				PM	NONE LISTED	5.9	LB/H	Other Case-by-Case
				SO2	LIMIT MAX % SULFUR OF ANODE COKE TO 2.95% LIMIT MAX % SULFUR OF ANODE PITCH TO 1.2%	271	LB/H	BACT-PSD
				VE	NONE LISTED	10	% OPACITY	Other Case-by-Case
IN-0037	ALUMINUM COMPANY OF AMERICA -	11/3/1989	FURNACE, PRODUCTION RING	FLUORIDES, TOTAL	DRY ALUMINA SCRUBBER	0.1	LB F/T ALUMINM EQUIV	N/A
				SOX	DRY ALUMINA SCRUBBER	94.0999	LB/H	Other Case-by-Case
				SOX	DRY ALUMINA SCRUBBER	1.13	T/DAY, 35 T/MONTH	BACT-PSD
				VE	DRY ALUMINA SCRUBBER	20	% OPACITY	Other Case-by-Case

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0041	ARCO METALS CO	4/19/1983	PRIMARY ALUMINUM REDUCTION POTLINE	FLUORIDE	A-398 DRY SCRUBBING/BAGHOUSE HOODING	1.9	LB/T	BACT-PSD
				PM	BAGHOUSE, HOODING FOR RAW MATL. HANDLING	0.02	GR/SCF	BACT-PSD
				SO2	FUEL SPEC: LOW S COKE & PITCH	388	LB/H	BACT-PSD
KY-0017	ARCO ALUMINUM	4/18/1983	MIXER, ANODE/CATHODE	PM	NONE LISTED	0.94	LB/H	BACT-PSD
			MIXER, ANODE, 3	PM	NONE LISTED	0.54	LB/H	BACT-PSD
			GREEN ANODE SCRAP STG	PM	NONE LISTED	5.1	LB/H	BACT-PSD
			COKE PACKING & CONVEYING	PM	NONE LISTED	0.99	LB/H	BACT-PSD
			FLUID COKE CONVEYING & DIST	PM	NONE LISTED	0.86	LB/H	BACT-PSD
			FURNACE, ELECTRIC ARC, 4	PM	NONE LISTED	2.8	LB/H	BACT-PSD
			FURNACE, HOLDING, 5	CO	NONE LISTED	0.63	LB/H	BACT-PSD
				NOX	NONE LISTED	6.7	LB/H	BACT-PSD
				PM	NONE LISTED	0.37	LB/H	BACT-PSD
				SO2	NONE LISTED	0.02	LB/H	BACT-PSD
				VOC	NONE LISTED	0.11	LB/H	BACT-PSD
			AL REDUCTION POTROOM LINES, 4	FLUORIDE	SCRUBBER	64.0999	T/YR	BACT-PSD
				PM	BAGHOUSE	1.9	LB/T AL	BACT-PSD
				SO2	FUEL SPEC: S CONTENT	358.8	LB/H	BACT-PSD
				VE	NONE LISTED	10	% OPACITY	BACT-PSD
			COKE FINISH & HANDLING	PM	NONE LISTED	1.2	LB/H	BACT-PSD
			COKE CRUSHING	PM	NONE LISTED	1.3	LB/H	BACT-PSD
			MILL, COKE BALL	PM	NONE LISTED	0.86	LB/H	BACT-PSD
			UNREACTED ORE STORAGE, 3 TANKS	PM	BAGHOUSE	1.4	LB/H	BACT-PSD
				PM	BAGHOUSE	0.58	LB/H	BACT-PSD
				PM	BAGHOUSE	0.71	LB/H	BACT-PSD
			ANODE BUTTS CLEANING	PM	NONE LISTED	2	LB/H	BACT-PSD
			ANODE ROD & STUB CLEANING	PM	NONE LISTED	1	LB/H	BACT-PSD
			BUTTS SURGE TANKS, 2	PM	NONE LISTED	0.86	LB/H	BACT-PSD
			BATH STG. BIN	PM	NONE LISTED	5.1	LB/H	BACT-PSD
			CRUSHER, CYOLITE BATH	PM	NONE LISTED	12.9	LB/H	BACT-PSD
			POT DEMOLITION	PM	NONE LISTED	8.6	LB/H	BACT-PSD
			CENTRAL BUTTS PROCESSING	PM	NONE LISTED	3.6	LB/H	BACT-PSD
			ANODE BUTTS STRIP & CRUSHER	PM	NONE LISTED	3.3	LB/H	BACT-PSD
			FURNACE, ELECTRIC ARC, 4	PM	NONE LISTED	2.8	LB/H	BACT-PSD
WA-0003	ALCOA	2/12/1982	POTLINES 1,2,3	SO2	FUEL SPEC: LIMIT S CONTENT IN COKE, RAW	3	% S IN COKE	Other Case-by-Case
NC-0003	ALCOA	5/20/1981	POTLINE 3	CO2	NONE LISTED	1444	LB/H	BACT-PSD
				FLUORINE	DRY SCRUBBER	12	LB/H	BACT-PSD
				PM	FABRIC FILTER	26	LB/H	BACT-PSD
				SO2	NONE LISTED	321	LB/H	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
MO-0036	NORANDA ALUMINUM, INC	6/1/1979	CARBON BAKING FURNACE FOR POTLINE 3	FLUORIDES, TOTAL	NONE LISTED	6.57	T/YR	N/A
				FPM10	NONE LISTED	98.5999	T/YR	N/A
			POTLINE 1	FLUORIDES, TOTAL	COATED FILTER DRY SCRUBBER	14.3	T/YR	N/A
				FPM10	COATED FILTER DRY SCRUBBER	56.76	T/YR	N/A
			POTLINE 3	FLUORIDES, TOTAL	COATED FILTER DRY SCRUBBER	6.6	T/YR	N/A
				FPM10	COATED FILTER DRY SCRUBBER	68.8	T/YR	N/A

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0116	NOVELIS CORPORATION - GUTHRIE	7/25/2022	Dross Press #1 (EU-039)	PM	Baghouse capable of achieveing 0.002 gr/dscf and good work practices plan	0.03 0.002	lb/hr gr/dscf	BACT-PSD
				PM_{10}		0.02 0.002	lb/hr gr/dscf	
				$PM_{2.5}$		0.02 0.002	lb/hr gr/dscf	
			Holding Furnace #1 (EU-034)	CO2e	Design requirements, good combustion & operation practices plan.	15387	tons/year, 12-month rolling	BACT-PSD
				CO	Good combustion & operation practices plan.	0.06	lb/ton, 3-hr average	
				NOx	Good combustion & operation practices plan. Low NOx burners.	0.040 0.063	lb/ton, 3-hr average lb/MMBtu	
				FPM	Baghouse capable of achieveing 0.002 gr/dscf and good work practices plan	0.03	lb/ton, 3-hr average	
				TPM10	Baghouse capable of achieveing 0.002 gr/dscf and good work practices plan	0.04	lb/ton, 3-hr average	
				TPM2.5	Baghouse capable of achieveing 0.002 gr/dscf and good work practices plan	0.03	lb/ton, 3-hr average	
				VOC	Good combustion & operation practices plan.	0.03	lb/ton, 3-hr average	
			Holding Furnace #2 (EU-035)	CO2e	Design requirements, good combustion & operation practices plan.	15387	tons/year, 12-month rolling	BACT-PSD
				CO	Good combustion & operation practices plan.	0.06	lb/ton, 3-hr average	
				NOx	Good combustion & operation practices plan. Low NOx burners.	0.040 0.063	lb/ton, 3-hr average lb/MMBtu	
				FPM	Baghouse capable of achieveing 0.002 gr/dscf and good work practices plan	0.03	lb/ton, 3-hr average	
				TPM10	Baghouse capable of achieveing 0.002 gr/dscf and good work practices plan	0.04	lb/ton, 3-hr average	
				TPM2.5	Baghouse capable of achieveing 0.002 gr/dscf and good work practices plan	0.03	lb/ton, 3-hr average	
				VOC	Good combustion & operation practices plan.	0.03	lb/ton, 3-hr average	
IN-0327	ALUMINUM RECOVERY TECHNOLOGIES, INC.	7/22/2021	Chip Dryer #1	VOC	Chip Dryer #1R is equipped with an afterburner, identified as Afterburner, with a maximum heat input capacity of 6.0 million British thermal units per hour for VOC control, exhausting through Stack Vent #3.	98	%	OTHER CASE-BY-CASE
IN-0339	ELEMENT 13 LLC	5/6/2021	Thermal Scrap Pre-treatment ovens	VOC	Two afterburners per oven operating in series	0.4	LBS / TONS OF SCRAP	OTHER CASE-BY-CASE
IN-0321	NIKKEI MC ALUMINUM AMERICA, INC.	3/17/2021	Chip Dryer #1R (EU-04R)	VOC	Chip Dryer #1R (EU-04R) is equipped with an afterburner with a maximum heat input capacity of 8.00 million British thermal units per hour for VOC control, exhausting through Stack S1.	98	%	OTHER CASE-BY-CASE
				CO2e	For EP128 and EP134, the BACT determination for Greenhouse Gases (CO2e) requires the facility to meet the following design and operational requirements: [401 KAR 51:017] i. The facility design shall include ultra-low NOx cold air baffle burners, ii. Monitoring of afterburner temperature, kiln temperature, combustion fuel/air ratios, kiln inlet O2, and kiln operating pressure as part of an overall control system to minimize the amount of natural gas supplied to the kiln and maximize the amount of heat generated from the partial oxidation of coatings on the incoming scrap stream, iii. Installing and maintaining kiln feed and discharge airlocks and seals to minimize tramp air inflow, iv. Maintaining low external surface temperatures of rotary drums through installation and maintenance of adequate refractory/insulation lining to minimize convective and radiant heat losses.	27662	TPY	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0103	LOGAN ALUMINUM, INC.	12/27/2020	EP 128 & 134 (9033 & 9037) Decoaters A & B	CO	Emissions from these decoaters are controlled by an integral afterburner for CO. The afterburner has a burner rating of 30.2 MMBtu/hr, a combustion chamber temperature of at least 1400 °F, and a minimum residence time of 1.0 seconds. The permittee shall prepare and maintain for EP128 and EP134, 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 NOx, CO, VOC, and GHG emissions. Any revisions requested by the Division shall be made and the revisions 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: [401 KAR 51:017] 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.	14.14	LB/HR	BACT-PSD
				NOX	The permittee shall prepare and maintain for EP128 and EP134, 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 NOx, CO, VOC, and GHG emissions. Any revisions requested by the Division shall be made and the revisions 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: [401 KAR 51:017] 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.	6.5	LB/HR	BACT-PSD
				VOC	Emissions from these decoaters are controlled by an integral afterburner for VOC. The afterburner has a burner rating of 30.2 MMBtu/hr, a combustion chamber temperature of at least 1400 °F, and a minimum residence time of 1.0 seconds. The permittee shall prepare and maintain for EP128 and EP134, 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 NOx, CO, VOC, and GHG emissions. Any revisions requested by the Division shall be made and the revisions 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: [401 KAR 51:017] 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.	1.99	LB/HR	BACT-PSD
			EP 07 (2015-1) Reversing Mill	VOC	The permittee shall prepare written operating instructions and procedures that specify good operating and maintenance practices and includes, at a minimum, the following specific practices targeting VOC emissions minimization: [401 KAR 51:017] i. Controlling coolant application rates per unit of production to remain within targeted ranges for ensuring process conditions are maintained at optimum levels while simultaneously preventing wasted coolant from entering the system. ii. Maintaining the supplied coolant temperature within required temperature ranges to prevent overheated coolant from being exposed to aluminum slab/strip and work/backup rolls. iii. Performing periodic physical/chemical analysis of coolant package to assess coolant conditions and evaluate excessive degradation or out-of-range specifications for key coolant properties.	10.0	LB/HR	BACT-PSD
			EP 08 (2015-2) Finishing Mill	VOC	The permittee shall prepare written operating instructions and procedures that specify good operating and maintenance practices and includes, at a minimum, the following specific practices targeting VOC emissions minimization: [401 KAR 51:017] i. Controlling coolant application rates per unit of production and kerosene usage rates for the slab threading process to remain within targeted ranges for ensuring process conditions are maintained at optimum levels while simultaneously preventing wasted coolant/kerosene from entering the system. ii. Maintaining the supplied coolant temperature within required temperature ranges to prevent overheated coolant from being exposed to aluminum slab/strip and work/backup rolls. iii. Performing periodic physical/chemical analysis of coolant package to assess coolant conditions and evaluate excessive degradation or out-of-range specifications for key coolant properties. iv. Spill prevention and other waste reduction measures to ensure the coolant supplied to the system remains within the bounds of the storage, circulation, filtration, and treatment systems.	73.2	LB/HR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
			EP 161-01/02 (3050-1) Cold Mill 4 with Heavy Oil Scrubber	VOC	This unit is equipped with a Heavy Oil Scrubber (HOS), where the roll coolant (in the form of mist and vapor emissions) will be recovered for reuse. For the Heavy Oil Scrubber, the permittee shall install operate, maintain, and calibrate, according to the manufacturer's instructions, a continuous parametric monitoring system for the HOS to monitor, at a minimum, the following parameters: i. Washing oil flow rate, ii. Washing oil supply temperature to the adsorber column, and iii. Distillation column vacuum pressure. The permittee shall maintain the overall capture efficiency of the fume exhaust system at or above 98%. The permittee shall prepare written operating instructions and procedures that specify good operating and maintenance practices and includes, at a minimum, the following specific practices targeting VOC emissions minimization: [401 KAR 51:017] i. Controlling coolant application rates per unit of production using an automated flatness system for ensuring process conditions are maintained at optimum levels. ii. Maintaining the supplied coolant temperature within required temperature ranges to prevent overheated coolant from being exposed to aluminum slab/strip and work/backup rolls. iii. Performing periodic	6.88	LB/HR	BACT-PSD
			EP 131/137 (9053/9054) Holder A & B	CO2e CO NOx VOC	GOOD COMBUSTION AND OPERATION PRACTICES	12309 0.0420 0.0320 0.0310	TPY LB/TON LB/TON LB/TON	BACT-PSD
AL-0306	CONSTELLIUM ELEMENT 13	10/9/2015	DUAL LADLE PREHEAT STATION	CO2e	NONE LISTED	4098	TPY	BACT-PSD
				CO	GOOD COMBUSTION PRACTICES	0	N/A	BACT-PSD
				NOX	LOW NOX BURNER	0.05	LB/MMBTU	BACT-PSD
				VOC	GOOD COMBUSTION PRACTICES	0	N/A	BACT-PSD
			DELACQUERING KILN 4	CO2e	NONE LISTED	9229	TPY	BACT-PSD
				CO	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
				NOX	LOW NOX BURNER	0.36	LB/TON OF ALUMINUM	BACT-PSD
				VOC	HOT GAS GENERATOR/THERMAL OXIDERZER	0.06	LB/TON	BACT-PSD
AL-0307	CONSTELLIUM ALLOYS PLANT	10/9/2015	TWO 1.37 MMBTU/HR STRIP DRYERS	CO2e	NONE LISTED	36251	TPY	BACT-PSD
				CO	GOOD COMBUSTION PRACTICES	0.03	LB/MMBTU	BACT-PSD
				NOX	LOW NOX BURNER	0.07	LB/MMBTU	BACT-PSD
				VOC	GOOD COMBUSTION PRACTICES	0.006	LB/MMBTU	BACT-PSD
			170" HOT ROLLING MILL	VOC	NONE LISTED	83	TPY	BACT-PSD
			TWO 4.44 MMBTU/HR STRIP DRYERS	CO2e	NONE LISTED	36251	TPY	BACT-PSD
				CO	GOOD COMBUSTION PRACTICES	0	N/A	BACT-PSD
				NOX	LOW NOX BURNER	0.07	LB/MMBTU	OTHER CASE-BY-CASE
				VOC	NONE LISTED	0.006	LB/MMBTU	OTHER CASE-BY-CASE
			120" HOT ROLLING MILL	VOC	FUME EXHAUST CONTROL	106	PPMVD	BACT-PSD
			COLD ROLLING MILL	VOC	FUME CONTROL SYSTEM	50	MG/M^3	BACT-PSD
			PUSHER FURNACE 3	CO2e	NONE LISTED	106651	TPY	BACT-PSD
				CO	GOOD COMBUSTION PRACTICES	0.09	LB/MMBTU	BACT-PSD
				NOX	LOW NOX BURNER	0.1	LB/MMBTU	BACT-PSD
				VOC	GOOD COMBUSTION PRACTICES	0.03	LB/MMBTU	BACT-PSD
			TWO HARDENING FUNACES	CO2e	NONE LISTED	36251	TPY	BACT-PSD
				CO	GOOD COMBUSTION PRACTICES	0	N/A	BACT-PSD
				NOX	LOW NOX BURNER	0.07	LB/MMBTU	BACT-PSD
				VOC	GOOD COMBUSTION PRACTICES	0.006	LB/MMBTU	BACT-PSD
NC-0003	ALCOA	5/20/1981	ANODE PRODUCTION	PM	NONE LISTED	9	LB/H	BACT-PSD
				SO2	NONE LISTED	13	LB/H	BACT-PSD
				VOC	NONE LISTED	5	LB/H	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
IL-0135	Nucor Steel Kankakee	4/30/2024	Two Ladle Preheaters	CO NOx TPM TPM10 SO2 VOC CO2e	Low-NOx burners, good combustion practices, and natural gas fuel	0.082 0.080 0.0019 0.0075 0.0005 0.0054 117.0	lb/MMBtu	BACT-PSD
AR-0185	Hybar LLC	4/11/2024	Tundish Preheaters	CO NOx TPM TPM10 TPM2.5 SO2 VE CO2e	Low-NOx burners, good combustion practices, and combustion of natural gas	0.0824 0.097 0.0075 0.0075 0.0075 0.0006 5.0% 117.0	lb/MMBtu	BACT-PSD
TX-0959	Ashoka Steel Mills LLC Steel Mill	6/28/2023	Ladle Dryer and Preheater	CO NOx FPM FPM10 FPM2.5 SO2 VOC	Good combustion practices and use of pipeline quality natural gas	0.084 0.100 0.0019 0.0019 0.0019 0.084 0.0019	lb/MMBtu	BACT-PSD
AR-0185	Hybar LLC	4/28/2023	Ladle Preheaters	CO NOx TPM TPM10 TPM2.5 SO2 CO2e	Low-NOx burners, good combustion practices, and combustion of clean fuel	0.0824 0.095 0.0075 0.0075 0.0075 0.0006 117.0	lb/MMBtu	BACT-PSD
WV-0034	Nucor Steel West Virginia LLC West Virginia Steel Mill	5/5/2022	Horizontal/Vertical Ladle Preheaters	CO NOx TPM SO2 VOC CO2e	Good Combustion Practices and Low-NOx burners	0.082 0.098 0.0075 0.0006 0.0054 7693	lb/MMBtu lb/MMBtu lb/MMBtu lb/MMBtu lb/MMBtu tpy	
TN-0183	Sinova Silicon LLC	4/25/2022	Ladle Preheater #1	CO NOx TPM, FPM, TPM10, TPM2.5 Opacity SO2 VOC CO2e	Good Combustion Practices and Low-NOx burners	0.082 0.098 0.0075 10% 0.0006 0.0054 15387 tons combined total 3 ladle preheaters	lb/MMBtu lb/MMBtu lb/MMBtu lb/MMBtu lb/MMBtu	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 06-01 - Lime Handling System (dump station & material transfer)	FPM	For the Lime Handling System (dump station & material transfer) (EP 06-01): The permittee shall install, operate, and maintain a dust collector designed to control particulate grain loading to 0.005 grain/dscf and the flow rate to 2000 dscf/min.	0.005	GR/DSCF	BACT-PSD
				TPM10	For the Lime Handling System (dump station & material transfer) (EP 06-01): The permittee shall install, operate, and maintain a dust collector designed to control particulate grain loading to 0.005 grain/dscf and the flow rate to 2000 dscf/min.	0.005	GR/DSCF	BACT-PSD
				TPM2.5	For the Lime Handling System (dump station & material transfer) (EP 06-01): The permittee shall install, operate, and maintain a dust collector designed to control particulate grain loading to 0.005 grain/dscf and the flow rate to 2000 dscf/min.	0.005	GR/DSCF	BACT-PSD
			EP 06-02 A & B - Lime Silos A & B	FPM	For Lime Silos A & B (EP 06-02A & B): The permittee shall install, operate, and maintain a bin vent filter on each silo designed to control particulate grain loading to 0.005 grain/dscf and the flow rate to 900 dscf/min.	0.005	GR/DSCF	BACT-PSD
				TPM10	For Lime Silos A & B (EP 06-02A & B): The permittee shall install, operate, and maintain a bin vent filter on each silo designed to control particulate grain loading to 0.005 grain/dscf and the flow rate to 900 dscf/min	0.005	GR/DSCF	BACT-PSD
				TPM2.5	For Lime Silos A & B (EP 06-02A & B): The permittee shall install, operate, and maintain a bin vent filter on each silo designed to control particulate grain loading to 0.005 grain/dscf and the flow rate to 900 dscf/min.	0.005	GR/DSCF	BACT-PSD
LA-0239	CONSOLIDATED ENVIRONMENTAL MANAGEMENT INC	5/24/2010	COK-112 - Coke Battery 1 FGD Lime Silo Unloading	FPM	BACT is selected as collection and control by fabric filters.	0.005	LB/H	BACT-PSD
			COK-212 - Coke Battery 2 FGD Lime Silo Unloading	FPM	BACT is selected as collection and control by fabric filters.	0.005	LB/H	BACT-PSD
AR-0078	NUCOR CORPORATION	6/9/2003	LIME SILO	FPM10	FABRIC FILTER	0.1	LB/H	BACT-PSD
IA-0055	IPSCO STEEL, INC	1/3/1995	STORAGE SILOS, LIME AND DOLOMITE, EP #3	FPM10	BAGHOUSE. STANDARD UNITS NOT AVAILABLE.	0.1	GR/DSCF	BACT-PSD
				VE	BAGHOUSE	3	% OPACITY	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 04-01 - Shot Blaster	FPM	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control particulate grain loading to 0.003 gr/dscf at an exhaust flow rate of 15,786 scfm.	0.003	GR/DSCF	BACT-PSD
				TPM10	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control particulate grain loading to 0.003 gr/dscf at an exhaust flow rate of 15,786 scfm.	0.003	GR/DSCF	BACT-PSD
				TPM2.5	This EP is required to have a Good Work Practices (GWP) Plan and a baghouse designed to control particulate grain loading to 0.003 gr/dscf at an exhaust flow rate of 15,786 scfm.	0.003	GR/DSCF	BACT-PSD
IN-0100	AK STEEL CORPORATION	2/13/1997	SHOT BLASTER CHAMBER	PM	FABRIC FILTER; SHOT BLAST CHAMBER TO BE ENCLOSED AND MAINTAINED UNDER NEGATIVE PRESSURE	0.006	LB/H	BACT-PSD
OH-0189	GE CAPITAL RAILCAR REPAIR SERVICES CORP	5/31/1991	SAND BLAST BUILDING	PM	BAGHOUSE	1.9	LB/H	BACT-PSD
OH-0099.A	RIMER ENTERPRISES, INC	12/10/1986	SHOT BLAST, STEEL	PM	FABRIC FILTER	0.02	LB/H	Other Case-by-Case
OH-0096	BARON DRAWN STEEL CORP.	9/17/1986	ROD CLEANING MACHINE, 3 WHEEL	PM	FABRIC FILTER	0.32	LB/H	Other Case-by-Case
TX-0126	TRICO INDUSTRIES, INC	1/12/1983	STEEL SHOT CLEANING	PM	BAGFILTER	15	LB/H	BACT-PSD
IN-0015	GMC, CENTRAL FOUNDRY DIV	4/28/1981	SAND BLAST SYS.	PM	BAGHOUSE	15	T/YR	Other Case-by-Case
MS-0013	BATESVILLE CASKET CO., INC.	7/26/1988	BOOTH, SAND	PM	NONE LISTED	0.04	PPH	Other Case-by-Case
			BOOTH, SAND	PM	NONE LISTED	0.04	PPH	Other Case-by-Case
			BOOTH, SAND	PM	NONE LISTED	0.04	PPH	Other Case-by-Case
			BOOTH, SAND	PM	NONE LISTED	0.04	PPH	Other Case-by-Case
CA-0514	ARB FABRICATED SYSTEMS, INC.	9/11/1992	BLASTING CABINET, ABRASIVE	FPM10	FABRIC COLLECTOR (PRECEDED BY A CYCLONE)	0.1	LBM/H	Other Case-by-Case
CA-0315	COASTCAST CORP.	10/10/1989	BLASTING MACHINE, ABRASIVE	PM	DUST COLLECTOR	13	LB/D	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0070	NSA-A DIVISION OF SOUTHWIRE CO	05/29/1998	COOLING TOWER	FPM10	REASONABLE POLLUTION PRECAUTIONS.	0.29	LB/H	Other Case-by-Case
LA-0400	NUCOR STEEL LOUISIANA, LLC DIRECT REDUCED IRON FACILITY	9/20/2023	Cooling Tower CT-1 (EQT0074)	H2S	Limit cooling water circulating rate to no more than 51,888 gpm (annual average)	0	N/A	BACT-PSD
SC-0205	SCOUT MOTORS INC A DELAWARE CORPORATION - BLYTHEWOOD PLANT	10/31/2023	Cooling Towers	FPM	Drift Eliminator	0.001	% DRIFT RATE	BACT-PSD
				TPM10	Drift Eliminator	0.001	% DRIFT RATE	BACT-PSD
				TPM2.5	Drift Eliminator	0.001	% DRIFT RATE	BACT-PSD
KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	FPM	Mist Eliminator, 0.001% drift loss	0.27	LB/HR	BACT-PSD
				TPM10	Mist Eliminator, 0.001% drift loss	0.19	LB/HR	BACT-PSD
				TPM2.5	Mist Eliminator, 0.001% drift loss	0.0006	LB/HR	BACT-PSD
			DCW Auxiliary Cooling Tower (EP 03-14)	FPM	Mist Eliminator, 0.001% drift loss	0.06	LB/HR	BACT-PSD
				TPM10	Mist Eliminator, 0.001% drift loss	0.05	LB/HR	BACT-PSD
				TPM2.5	Mist Eliminator, 0.001% drift loss	0.0001	LB/HR	BACT-PSD
			Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	FPM	Mist Eliminator, 0.001% drift loss	0.17	LB/HR	BACT-PSD
				TPM10	Mist Eliminator, 0.001% drift loss	0.12	LB/HR	BACT-PSD
				TPM2.5	Mist Eliminator, 0.001% drift loss	0.0004	LB/HR	BACT-PSD
			Air Separation Plant Cooling Tower (EP 03-13)	FPM	Mist Eliminator, 0.001% drift loss	0.08	LB/HR	BACT-PSD
				TPM10	Mist Eliminator, 0.001% drift loss	0.07	LB/HR	BACT-PSD
				TPM2.5	Mist Eliminator, 0.001% drift loss	0.0002	LB/HR	BACT-PSD
			Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	FPM	Mist Eliminator, 0.001% drift loss	0.39	LB/HR	BACT-PSD
				TPM10	Mist Eliminator, 0.001% drift loss	0.29	LB/HR	BACT-PSD
				TPM2.5	Mist Eliminator, 0.001% drift loss	0.0008	LB/HR	BACT-PSD
			Cold Mill Cooling Tower (EP 03-12)	FPM	Mist Eliminator, 0.001% drift loss	0.14	LB/HR	BACT-PSD
				TPM10	Mist Eliminator, 0.001% drift loss	0.094	LB/HR	BACT-PSD
				TPM2.5	Mist Eliminator, 0.001% drift loss	0.0003	LB/HR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 09-02 - Melt Shop DCW Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.04	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.03	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0001	LB/HR	BACT-PSD
			EP 09-08 - Air Separation Plant Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.1	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.08	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0002	LB/HR	BACT-PSD
			EP 09-06 - Light Plate Quench DCW Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.06	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.04	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0001	LB/HR	BACT-PSD
			EP 09-04 - Rolling Mill DCW Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.17	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.12	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0004	LB/HR	BACT-PSD
			EP 09-03 - Rolling Mill ICW Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.06	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.04	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0001	LB/HR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
			EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.78	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.54	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0017	LB/HR	BACT-PSD
			EP 09-07 - Heavy Plate Quench DCW Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.02	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.02	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0001	LB/HR	BACT-PSD
			EP 09-01 - Melt Shop ICW Cooling Tower	FPM	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.36	LB/HR	BACT-PSD
				TPM10	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.27	LB/HR	BACT-PSD
				TPM2.5	High Efficiency Mist Eliminator. The mist eliminator drift loss shall be maintained at 0.001% or less to total gpm.	0.0008	LB/HR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Contact Cooling Towers - Melt Shop 2 (P027)	FPM	i. use of drift eliminator(s) designed to achieve a 0.001% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop 2 Cooling Tower - 1000 Caster Mold Water Cooling Tower - 800 Tunnel Furnace Cooling Tower - 800 Caster Non-Contact 2 Cooling Tower - 800 Caster Contact 2 Cooling Tower - 1400	1.170	T/YR	BACT-PSD
				FPM10	i. use of drift eliminator(s) designed to achieve a 0.001% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop 2 Cooling Tower - 1000 Caster Mold Water Cooling Tower - 800 Tunnel Furnace Cooling Tower - 800 Caster Non-Contact 2 Cooling Tower - 800 Caster Contact 2 Cooling Tower - 1400	0.930	T/YR	BACT-PSD
			Contact Cooling Towers (P014)	FPM	i. use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400	8.7	T/YR	BACT-PSD
				FPM10	i. use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400	6.95	T/YR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
				FPM2.5	☐use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400	0.020	T/YR	BACT-PSD
FL-0368	NUCOR STEEL FLORIDA, INC.	2/14/2019	Two Cooling Towers	TPM	Drift eliminators	0.001	% DRIFT RATE	BACT-PSD
OH-0376	IRONUNITS LLC - TOLEDO HBI	2/9/2018	Wet Cooling Tower (P005)	TPM10	Drift eliminator with a maximum drift rate of 0.0005% and total dissolved solids (TDS) concentration of the cooling water less than or equal to 1,100 parts per million by weight (ppmw).	0.020	LB/H	BACT-PSD
				TPM2.5	Drift eliminator with a maximum drift rate of 0.0005% and total dissolved solids (TDS) concentration of the cooling water less than or equal to 1,100 parts per million by weight (ppmw).	0.020	LB/H	BACT-PSD
				VE	Drift eliminator with a maximum drift rate of 0.0005% and total dissolved solids (TDS) concentration of the cooling water less than or equal to 1,100 parts per million by weight (ppmw).	0.000	N/A	N/A
LA-0309	BENTELER STEEL / TUBE MANUFACTURING CORPORATION	6/4/2015	Cooling Towers	TPM10	Drift eliminators	0.0005	% DRIFT RATE	BACT-PSD
				TPM2.5	Drift eliminators	0.0005	% DRIFT RATE	BACT-PSD
			COOLING TOWER: ROLLING MILL (CONTACT) ID#15B	FPM	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
				FPM10	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
			COOLING TOWER: #1 CAST ID#15D (CONTACT)	FPM	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
				FPM10	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	12/21/2012	COOLING TOWER: ROLLING MILL/CASTER (NON-CONTACT) ID#15E	FPM	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.003	% DRIFT RATE	BACT-PSD
				FPM10	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.003	% DRIFT RATE	BACT-PSD
			COOLING TOWER: ROLLING MILL (CONTACT) ID#15A	FPM	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
				FPM10	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
			COOLING TOWER: LVD BOILER (CONTACT) ID#15G	FPM	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.005	% DRIFT RATE	BACT-PSD
				FPM10	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.005	% DRIFT RATE	BACT-PSD
			COOLING TOWER: ROLLING MILL ID#15C (NONCONTACT)	FPM	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
				FPM10	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
			COOLING TOWER: CASTER SPRAYS (CONTACT) ID#15F	FPM	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD
				FPM10	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
OH-0392	NUCOR STEEL MARION, INC.	2/27/2024	Vehicular Traffic (F001)	FPM10	Best available control measures – speed reduction, good housekeeping practices, watering, resurfacing, and/or chemical stabilization	4.4	T/YR	BACT-PSD
				FPM2.5	Best available control measures – speed reduction, good housekeeping practices, watering, resurfacing, and/or chemical stabilization	0.63	T/YR	BACT-PSD
				PM, FUGITIVE	Best available control measures – speed reduction, good housekeeping practices, watering, resurfacing, and/or chemical stabilization	18.15	T/YR	BACT-PSD
				VE	Best available control measures – speed reduction, good housekeeping practices, watering, resurfacing, and/or chemical stabilization	0	%	BACT-PSD
SC-0205	SCOUT MOTORS INC A DELAWARE CORPORATION - BLYTHEWOOD PLANT	10/31/2023	Roads	PM, FUGITIVE	Paving and maintaining all roads	0	N/A	BACT-PSD
				FPM10	Paving and maintaining all roads	0	N/A	BACT-PSD
				FPM2.5	Paving and maintaining all roads	0	N/A	BACT-PSD
IN-0359	NUCOR STEEL	3/30/2023	Paved Roads	PM, FUGITIVE	Comply with fugitive dust control plan	0	N/A	BACT-PSD
AR-0173	BIG RIVER STEEL LLC	1/31/2022	Paved Roadways	FPM	Development and Implementation of Fugitive Dust Control Plan	2.8	T/YR	BACT-PSD
				TPM10	Development and Implementation of Fugitive Dust Control Plan	0.6	T/YR	BACT-PSD
				TPM2.5	Development and Implementation of Fugitive Dust Control Plan	0.2	T/YR	BACT-PSD
				VE	Development and Implementation of Fugitive Dust Control Plan	20	%	BACT-PSD
AR-0172	NUCOR CORPORATION NUCOR STEEL ARKANSAS	9/1/2021	SN-122 SN-210 Paved Roads	FPM	Water Sprays, sweeping	15.2	LB/HR	BACT-PSD
				TPM10	Water Sprays, sweeping	3.9	LB/HR	BACT-PSD
				TPM2.5	Water Sprays, sweeping	0.5	LB/HR	BACT-PSD
KY-0115	NUCOR STEEL GALLATIN, LLC	4/19/2021	Paved Roads & Satellite Coil Yard (EPs 04-01 & 04-04)	FPM	Sweeping & Watering	0	N/A	BACT-PSD
				TPM10	Sweeping & Watering	0	N/A	BACT-PSD
				TPM2.5	Sweeping & Watering	0	N/A	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
				FPM10	Best available control measures – speed reduction, good housekeeping practices, watering, resurfacing, and/or chemical stabilization	4.4	T/YR	BACT-PSD
IL-0132	NUCOR STEEL KANKAKEE, INC.	1/25/2021	New and Modified Roadways	TPM	Roadways shall be paved; speed limit posting of 15 miles/hour; best management practices to reduce fugitive emissions in accordance with written operating program that provides for cleaning or treatment of roadways	0	N/A	BACT-PSD
				TPM10	Roadways shall be paved; speed limit posting of 15 miles/hour; best management practices to reduce fugitive emissions in accordance with written operating program that provides for cleaning or treatment of roadways	0	N/A	BACT-PSD
				TPM2.5	Roadways shall be paved; speed limit posting of 15 miles/hour; best management practices to reduce fugitive emissions in accordance with written operating program that provides for cleaning or treatment of roadways	0	N/A	BACT-PSD
KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 14-01 - Paved Roadways	PM, FUGITIVE	Surface improvements (pavement), sweeping (good work practice) and watering	0	N/A	BACT-PSD
OH-0381	NORTHSTAR BLUESCOPE STEEL, LLC	9/27/2019	Plant Roadways & Parking Areas (F005)	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	T/YR	BACT-PSD
				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	T/YR	BACT-PSD
				PM, 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	T/YR	BACT-PSD
				VE	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	N/A	BACT-PSD
OH-0376	IRONUNITS LLC - TOLEDO HBI	2/9/2018	Paved roads (F001)	FPM10	Water flushing and sweeping	0.63	T/YR	BACT-PSD
				FPM2.5	Water flushing and sweeping	0.15	T/YR	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0070	NSA-A DIVISION OF SOUTHWIRE	5/29/1998	0.4 MILE PLANT ROAD	FPM10	REASONABLE POLLUTION PRECAUTIONS.	0.42	LB/H	Other Case-by-Case
				PM	REASONABLE POLLUTION PRECAUTIONS.	2.15	LB/H	Other Case-by-Case
LA-0400	NUCOR STEEL LOUISIANA, LLC	9/20/2023	South Ore Yard Screens (EQT0127 - EQT0130)	FPM10	Water suppression	0	N/A	BACT-PSD
				FPM2.5	Water suppression	0	N/A	BACT-PSD
AR-0173	BIG RIVER STEEL LLC	1/31/2022	Vehicle Travel on Paved and Unpaved Roads	FPM	Development and Implementation of Fugitive Dust Control Plan	0.2	T/YR	BACT-PSD
				TPM10	Development and Implementation of Fugitive Dust Control Plan	0.1	T/YR	BACT-PSD
				TPM2.5	Development and Implementation of Fugitive Dust Control Plan	0.1	T/YR	BACT-PSD
KY-0110	NUCOR STEEL BRANDENBURG	7/23/2020	EP 12-02 - Slag Processing Piles	PM, FUGITIVE	Use of dust suppressants	0	N/A	BACT-PSD
LA-0384	NUCOR STEEL LOUISIANA, LLC	6/13/2019	Bulk Material Storage Piles and Handling (FUG0023 - FUG0026)	TPM10	Wet suppression and minimize handling	0.0	N/A	BACT-PSD
				TPM2.5	Wet suppression and minimize handling	0	N/A	BACT-PSD
SC-0183	NUCOR STEEL - BERKELEY	5/4/2018	Raw Material Handling and Processing (carbon dump fugitives)	FPM	Good Work Practice Standards and Proper Operation and Maintenance.	0	N/A	BACT-PSD
			Raw Material Handling and Processing (alloy grizzly fugitives)	FPM	Good Work Practice Standards and Proper Operation and Maintenance.	0	N/A	BACT-PSD
			Raw Material Handling and Processing (lime dump fugitives)	FPM	Good Work Practice Standards and Proper Operation and Maintenance.	0	N/A	BACT-PSD
			Pickle Line Equipment (pickle line no. 3 fugitives) ***Source not built	CO2e	Energy Efficient Design	0	N/A	BACT-PSD
				FPM	Good Work Practice Standards and Proper Operation and Maintenance	0	N/A	BACT-PSD
				TPM10	Good Work Practice Standards and Proper Operation and Maintenance	0	N/A	BACT-PSD
				TPM2.5	Good Work Practice Standards and Proper Operation and Maintenance	0	N/A	BACT-PSD
				VOC	Proper Operation and Maintenance	0	N/A	BACT-PSD
FL-0368	NUCOR STEEL FLORIDA, INC. NUCOR STEEL FLORIDA FACILITY	2/14/2019	Silos	FPM	Bin vent filters	0.005	GR/DSCF	BACT-PSD

Project Name EGA - Inola
Project Location Inola, OK
RBLC Date 9/26/2025

RBLCID	Facility Name	Permit Issue Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units	Case-By-Case Basis
KY-0070	NSA-A DIVISION OF	5/29/1998	0.4 MILE PLANT ROAD	FPM10	REASONABLE POLLUTION PRECAUTIONS.	0.42	LB/H	Other Case-by-Case
AK-0084	DONLIN GOLD LLC. DONLIN GOLD PROJECT	6/30/2017	Material Loading and Unloading	TPM	Best Practical Methods/Fugitive Dust Control Plan (includes water spray)	530	T/YR COMBINED	BACT-PSD
				TPM10	Best Practical Methods/Fugitive Dust Control Plan (includes water spray)	530	T/YR COMBINED	BACT-PSD
				TPM2.5	Best Practical Methods/Fugitive Dust Control Plan (includes water spray)	530	T/YR COMBINED	BACT-PSD
			Fugitive Dust from Wind Erosion	TPM	Best Practical Methods/Fugitive Dust Control Plan (includes water spray)	32	TPY	BACT-PSD
				TPM10	Best Practical Methods/Fugitive Dust Control Plan (includes water spray)	32	TPY	BACT-PSD
				TPM2.5	Best Practical Methods/Fugitive Dust Control Plan (includes water spray)	32	TPY	BACT-PSD
			Drilling and Blasting	CO2e	Good Combustion Practices	11800	TPY	BACT-PSD
				CO	Good Combustion Practices	1900	TPY	BACT-PSD
				NOX	Good Combustion Practices	50	TPY	BACT-PSD
				TPM	Best Practical Methods	273	TPY COMBINED	BACT-PSD
				TPM10	Best Practical Methods	273	TPY COMBINED	BACT-PSD
				TPM2.5	Best Practical Methods	273	TPY COMBINED	BACT-PSD
SC-0196	NUCOR CORPORATION - DARLINGTON PLANT	4/29/2019	Raw Material Handling and Maintenance Activities	FPM	Good work practices and follow dust minimization plan.	0	N/A	BACT-PSD
				FPM10	Good work practices and follow dust minimization plan.	0	N/A	BACT-PSD

APPENDIX B: COST EVALUATIONS

Input name	Value	Notes
General		
Project name	Aluminum Smelter	Enter a short name
Facility	Oklahoma Aluminum	Company/site
Unit/Process	Potroom A	Source controlled
Analysis year	2026	Calendar year
Operating hours (hr/yr)	8760	Hours per year
Discount rate i (decimal)	0.0775	e.g., 0.0775 for 7.75%
Equipment life n (years)	20	Scrubber economic life
Process & Emissions		
Gas flow rate (acfm)	1897891.32	Actual cubic feet per minute
Gas temperature (°F)	338	Optional
Inlet SO2 concentration (ppm)	500	Baseline concentration
Outlet SO2 concentration (ppm)	50	Post-control concentration
Removal efficiency (%)	90.41762	If not using outlet ppm
Molecular weight SO2 (lb/lbmol)	64.066	Reference value
Gas molecular weight (lb/lbmol)	29	Use 29 for air
Cost Inputs — Capital		
Scrubber vessel & internals ($)	164,169,381	Packed/venturi vessel
Circulation pump(s) ($)	12,312,704	Pumps & motors
Mist eliminator ($)	15,390,879	Drift eliminator
Reagent preparation & storage ($)	20,521,173	Tanks, mixers
ID fan upgrade/addition ($)	30,781,759	If applicable
Ductwork & stack ($)	20,521,173	Ducts, stack mods
Instrumentation & controls ($)	10,260,586	DCS/PLC, gauges
Installation labor & materials ($)	41,042,345	Construction
Engineering & permitting (% of equip	10	Percent of equipment subtotal
Contingency (% of subtotal)	15	Applied to capital subtotal
Cost Inputs — Annual O&M		
Operator labor (hrs/yr)	8760	Annual operator time
Labor rate ($/hr)	60	Loaded rate
Maintenance materials ($/yr)	13500000	Spares, packing
Electricity rate ($/kWh)	0.15	Utility price
Pump power (kW)	250	Circulation pump(s)
Fan power (kW)	500	ID fan (if applicable)
Water use (gpm)	500	Average makeup rate
Water price ($/1000 gal)	8	Cost of water
Waste disposal ($/yr)	7000000	Sludge/disposal
Reagent Usage & Price		
Reagent type	Lime	e.g., Lime or Caustic
Reagent price ($/ton)	150	Delivered price
Reagent stoich factor (ton reagent / t	1.2	Accounts for efficiency & purity

Item	Amount ($)	Notes
Scrubber vessel & internals	164,169,381.11	From Inputs
Circulation pump(s)	12,312,703.58	From Inputs
Mist eliminator	15,390,879.48	From Inputs
Reagent preparation & storage	20,521,172.64	From Inputs
ID fan upgrade/addition	30,781,758.96	From Inputs
Ductwork & stack	20,521,172.64	From Inputs
Instrumentation & controls	10,260,586.32	From Inputs
Installation labor & materials	41,042,345.28	From Inputs
Equipment subtotal	263,697,068.40	Sum of equipment items
Engineering & permitting	26,369,706.84	Percent of equipment subtotal
Capital subtotal (before contingency)	341,369,706.84	Equip + install + eng
Contingency	3,955,456.03	Percent of subtotal
Total installed capital cost	345,325,162.87	Subtotal + contingency

O&M item	Amount ($/yr)	Notes
Operator labor	525,600.00	Hours × rate
Maintenance materials	13,500,000.00	Annual parts & materials
Electricity (pumps)	328,500.00	kW × hours × $/kWh
Electricity (fan)	657,000.00	kW × hours × $/kWh
Water cost	2,102,400.00	gpm × 60 × hours ÷ 1000 × $/kgal
Waste disposal	7,000,000.00	Annual disposal
Reagent consumption (tons/yr)	6,902.23	SO2 removed (tons/yr) × stoich factor
Reagent cost ($/yr)	1,035,334.76	Tons/yr × $/ton
Total annual O&M	25,148,834.76	Sum of O&M + reagent

Metric	Value	Formula/Notes
Capital cost (installed)	345,325,162.87	From Capital Cost sheet
Capital recovery factor (CRF)	10.0%	i(1+i)^n / [(1+i)^n - 1]
Annualized capital	34,520,337.07	Capital × CRF
Annual O&M	25,148,834.76	From Annual O&M sheet
Total annualized cost	59,669,171.83	Annualized capital + O&M

Metric	Value	Notes
Inlet SO2 emission rate (lb/hr)	1452.383	ppm × acfm × 60 × MW_SO2 / (385.3 × MW_gas)
Outlet SO2 emission rate (lb/hr)	139.173	ppm × acfm × 60 × MW_SO2 / (385.3 × MW_gas)
Inlet SO2 (tons/yr)	6,361.44	lb/hr × hours / 2000
Outlet SO2 (tons/yr)	609.58	lb/hr × hours / 2000
SO2 removed (tons/yr)	5,751.86	Inlet – Outlet
Cost-effectiveness ($/ton removed)	$ 10,373.89	Annualized cost / SO2 removed

Input name	Value	Notes
General		
Project name	Aluminum Smelter	Enter a short name
Facility	Oklahoma Aluminum	Company/site
Unit/Process	Paste Plant	Source controlled
Analysis year	2026	Calendar year
Operating hours (hr/yr)	8760	Hours per year
Discount rate i (decimal)	0.07	e.g., 0.07 for 7%
Equipment life n (years)	15	Baghouse economic life
Process & Emissions		
Gas flow rate (acfm)	17000	Actual cubic feet per minute
Gas temperature (°F)	250	For density adjust (optional)
Static pressure (in. w.c.)	8	Fan total static (optional)
Inlet PM concentration (gr/dscf)	0.01	Baseline concentration
Outlet PM concentration (gr/dscf)	0.001	Post-control concentration
Capture/collection efficiency (%)	99	If not calculating via conc
Cost Inputs — Capital		
Baghouse base cost ($)	$ 50,000.00	Vendor-supplied equipment
Induced draft fan cost ($)	$ 50,000.00	Fan & motor
Ductwork cost ($)	$ 30,000.00	Ducts, stacks
Instrumentation & controls ($)	$ 25,000.00	DCS/PLC, gauges
Installation labor & materials ($)	$ 125,000.00	Construction
Engineering & permitting (% of equip)	10	Percent of equipment subtotal
Contingency (% of subtotal)	1500%	Applied to capital subtotal
Cost Inputs — Annual O&M		
Operator labor (hrs/yr)	500	Annual operator time
Labor rate ($/hr)	60	Loaded rate
Maintenance materials ($/yr)	40000	Spare parts, seals
Bag replacement interval (years)	5	Average bag life
Bag replacement cost ($ per event)	200000	All bags & labor
Electricity rate ($/kWh)	0.08	Utility price
Fan power (kW)	50	If unknown, enter estimate
Additional utilities ($/yr)	0	Compressed air, etc.
Waste disposal ($/yr)	5000	Dust/solids disposal

Item	Amount ($)	Notes
Baghouse equipment	50,000.00	From Inputs
Induced draft fan	50,000.00	From Inputs
Ductwork	30,000.00	From Inputs
Instrumentation & controls	25,000.00	From Inputs
Installation labor & materials	125,000.00	From Inputs
Equipment subtotal	155,000.00	Sum of equipment items
Engineering & permitting	12,500.00	Percent of equipment subtotal
Capital subtotal (before contingency)	292,500.00	Equip + install + eng
Contingency	1,875.00	Percent of subtotal
Total installed capital cost	294,375.00	Subtotal + contingency

O&M item	Amount ($/yr)	Notes
Operator labor	30,000.00	Hours × rate
Maintenance materials	40,000.00	Annual parts & materials
Bag replacement annualized	40,000.00	Event cost / interval
Electricity (fan)	35,040.00	kW × hours × $/kWh
Additional utilities	5,000.00	Compressed air, etc.
Waste disposal	5,000.00	Annual disposal
Total annual O&M	150,040.00	Sum of O&M items

Metric	Value	Formula/Notes
Capital cost (installed)	294,375.00	From Capital Cost sheet
Capital recovery factor (CRF)	11.0%	i(1+i)^n / [(1+i)^n - 1]
Annualized capital	32,320.79	Capital × CRF
Annual O&M	150,040.00	From Annual O&M sheet
Total annualized cost	182,360.79	Annualized capital + O&M

Metric	Value	Notes
Inlet PM emission rate (lb/hr)	0.3	gr/dscf × acfm × 60 / 7000
Outlet PM emission rate (lb/hr)	0.003	gr/dscf × acfm × 60 / 7000
Inlet PM (tons/yr)	0.65	lb/hr × hours / 2000
Outlet PM (tons/yr)	0.01	lb/hr × hours / 2000
PM removed (tons/yr)	0.65	Inlet – Outlet
Cost-effectiveness ($/ton removed)	$ 281,655.69	Annualized cost / PM removed

APPENDIX E CLASS II AIR DISPERSION MODELING PROTOCOL

Class II PSD Air Quality Dispersion Modeling Protocol

Oklahoma Aluminum: New Primary Aluminum Smelter

Oklahoma Aluminum

DATE
9 February 2026

0793283

SIGNATURE PAGE

Class II PSD Air Quality Dispersion Modeling Protocol

Oklahoma Aluminum: New Primary Aluminum Smelter

0793283

Jeffery H. Twaddle
Partner

Olga Samani
Technical Director

Robert Van Kleeck
Scientist

Environmental Resources Management
ERM's Glastonbury Office
95 Glastonbury Boulevard
Suite 101
Glastonbury
Connecticut
United States
06033
T: +1 860 466 8500
F: +1 860 466 8501

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronym	Description
$\mu g/m^3$	micrograms per cubic meter
AQRV	Air Quality-Related Values
AQS	Air Quality Standards
BPIP	Building Profile Input Program
CFR	Code of Federal Regulations
CO	carbon monoxide
EPN	Emission Point Numbers
ERM	Environmental Resources Management, Inc.
GAQM	EPA Guideline on Air Quality Model
GEP	Good Engineering Practice
GHG	greenhouse gas
km	Kilometer
MERP	Modeled Emission Rates for Precursors
NAAQS	National Ambient Air Quality Standards
NH3	Ammonia
NOx	nitrogen oxides
NSR	New Source Review
PM	particulate matter
PM10	PM with aerodynamic diameter less than 10 microns
PM2.5	PM with aerodynamic diameter less than 2.5 microns
ppb	parts per billion
PRIME	Plume Rise Model Enhancement
Project	Aluminium smelter to be located in Inola, Oklahoma
PSD	Prevention of Significant Deterioration
SIA	Significant Impact Area
SMC	Significant Monitoring Concentration

Acronym	Description
SO2	sulfur dioxide
TPY	tons per year
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

1. PROJECT OVERVIEW

Oklahoma Aluminum (OA) is proposing to build a new aluminum smelting facility in Inola, Oklahoma ("Project"). The property is a greenfield site within the Inola industrial park developed by Tulsa Ports, and all OA processes and equipment will be new. This industrial site is in the Inola municipality, Rogers County, State of Oklahoma, 40 kilometers (25 miles) east of the city of Tulsa (36°07'22"N 95°33'18"W), and approximately 200 kilometers (125 miles) North-East of Oklahoma City.

The proposed Project will produce aluminum metal (Al) through the Hall- Héroult process, utilizing OA EX Pot Technology across 484 pots housed in two potroom buildings. Each potroom will contain 242 pots, split into two sections of 121 pots. The facility projects to produce 826,734 tons per year of liquid aluminum. Exhaust from each of the 484 pots are captured and ducted to one of two gas treatment centers to control emissions. During pot tending operations, the air flow rate from the potlines to the gas treatment centers is increased to minimize uncaptured emissions. Uncaptured emissions will exhaust through a roof vent on top of the potline buildings.

The smelter includes material handling facilities to receive and store the raw materials (alumina and petroleum coke) required for the smelter process. Additionally, there will be a carbon paste plant, baking furnace, rodding shop, bath treatment facility, cast house to produce pure aluminium ingot, alloyed aluminium ingot, sheet ingot and extrusion billet product, along with all necessary auxiliary, pollution control facilities, services and offices.

The Project will consist of the following equipment:

- Aluminum smelting potrooms A & B
- Potline services (potshell lining/delining, crucible cleaning, taping tube cleaning)
- Small natural gas-fired heaters/boilers/furnaces (<100 MMBtu/hr)
- Casthouse services (crucible skimming, dross treatment)
- Solid material storage silos
- Liquid material storage tanks
- Paste mixing lines dry materials (dry aggregate crushing, milling, and classifiers)
- Paste mixing – anode formation (pitch melting, paste mixing, and anode forming)
- Anode baking furnace
- Shot blasting operations
- Baked anode services (cleaning, slot cutting, loading/unloading, bath removal, butt removal, recycling, cast iron cleaning, rod brushing)
- Raw material handling (suction pipe unloader, conveyor, truck loading/unloading, bucket elevator, bag breaker)
- Emergency generators

- Cooling Towers
- Paved roadways

The Air Quality Analysis will be conducted to demonstrate that conservatively calculated emissions associated with the Project will not cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS), or Prevention of Significant Deterioration (PSD) increment consumption limits. Methods to assess Project's impacts with respect to growth, visibility, and soils will also be discussed. Class I PSD Increment and Air Quality-Related Values (AQRVs) will be addressed in a separate document.

1.1 TYPE OF PERMIT REVIEW

Rogers County is designated as an attainment or unclassified area for all criteria pollutants. As shown in the air permit application, the proposed Project will be subject to New Source Review (NSR) permitting and PSD review for NSR regulated pollutants, which are nitrogen oxides (NOx), carbon monoxide (CO), particulate matter (PM), PM with aerodynamic diameters less than 10 microns (PM_{10}), PM with aerodynamic diameters less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), Volatile Organic Compounds (VOCs), and GHG emissions. As such, this consolidated application along with the modeling protocol is being submitted for the NSR and PSD permits.

Table 1-1 below provides a summary of PSD applicability for each PSD-regulated pollutant.

TABLE 1-1: TOTAL PROJECT POTENTIAL EMISSIONS IN COMPARISON TO MAJOR SOURCE THRESHOLDS

Pollutant	Project Emissions (TPY)	PSD Major Source Threshold (TPY)	Subject To PSD Review?
NOx	316.2	100	Yes
CO	87183.0	100	Yes
VOC	217.6	100	Yes
SO_2	1520.1	100	Yes
PM	731.1	100	Yes
PM_{10}	453.7	100	Yes
$PM_{2.5}$	265.5	100	Yes
GHG (CO_2e)	6,938,730.4	75,000	Yes

Based on preliminary PTE (Potential to Emit), the Project will trigger PSD review for NOx, CO, SO_2, PM, PM_{10}, and $PM_{2.5}$. To satisfy PSD review requirements, these pollutants were evaluated for comparison with the NAAQS and PSD increment consumption limits, summarized in Table 1-2.

1.2 REGULATORY AMBIENT IMPACT ASSESSMENT

The following section outlines the proposed approach to assessing impacts from the Project. This will include methods to:

- Determine whether the proposed Project has a significant air quality impact for each pollutant subject to PSD review;
- Demonstrate compliance with the PSD Increments;
- Demonstrate compliance with the NAAQS;

1.3 SIGNIFICANCE IMPACT ANALYSIS

The significance impact level (SIL) analysis involves refined modeling to determine maximum ambient impacts from the Project in comparison to pollutant-specific SILs. The applicable Class II Area SILs are summarized in Table 1-2. The results of the significance analysis determine the potential need for further cumulative modeling, which would include all impacts from the Project sources, potentially explicit modeling of nearby non-Project emission sources (discussed in Section 5), and the addition of an ambient background concentration to represent minor sources in the area not explicitly included in the modeling to evaluate compliance with the NAAQS (discussed in Section 6). Compliance with the PSD increments does not include ambient background. The Project sources to be included in the SIL modeling are discussed in Section 2 and listed in Appendix B. The results of the modeling of Project sources will be compared to the SILs to conservatively estimate the significant impact area for each pollutant and averaging period. Only the receptors within the SIA will be utilized for cumulative modeling. For those pollutants and periods for which the model-predicted impacts are below the SILs, compliance with the NAAQS / PSD increment is demonstrated and no further analysis is required.

TABLE 1-2: SUMMARY OF CLASS II SILS, NAAQS, INCREMENTS (µg/m3)

Pollutant	Averaging Period	Significant Impact Level (SIL)	NAAQS Primary	NAAQS Secondary	PSD Increment
SO_2	1-hour	7.8	196	--	--
	3-hour	25	--	1300	512
	24-hour	5	--	--	91
	Annual	1	--	26	20
CO	1-hour	2,000	40,000	--	--
	8-hour	500	10,000	--	--
NO_2	1-hour	7.5	188	--	--
	Annual	1	100	100	25
PM_{10}	24-hour	5	150	150	30
	Annual	1	--	--	17
$PM_{2.5}$	24-hour	1.2	35	35	9
	Annual	0.13	9	15	4

1.4 CUMULATIVE IMPACT ANALYSES

If the modeled ambient air concentration from the proposed Project equals or exceeds the SIL for either the short term or the annual averaging period for a respective criteria pollutant, a cumulative impact assessment will be conducted. Initially, the significant impact area, which is the area surrounding the facility within a radial distance at which predicted air concentrations are at or above the SIL, will be determined for averaging period(s) that equaled or exceeded the SIL. This full impact NAAQS analysis will account for the combined impact of the proposed Project sources and emissions from other nearby sources along with a representative background ambient air concentration. The cumulative impacts are then compared to the NAAQS to determine whether the proposed Project will cause or contribute to a violation of the NAAQS. The cumulative PSD increment analysis will include all of the proposed Project sources and emissions from offsite PSD consuming and PSD expanding sources identified. The offsite inventory is discussed in Section 5, and the applicable NAAQS and Class II PSD Increments are summarized in Table 1-2.

2. EMISSION SOURCES

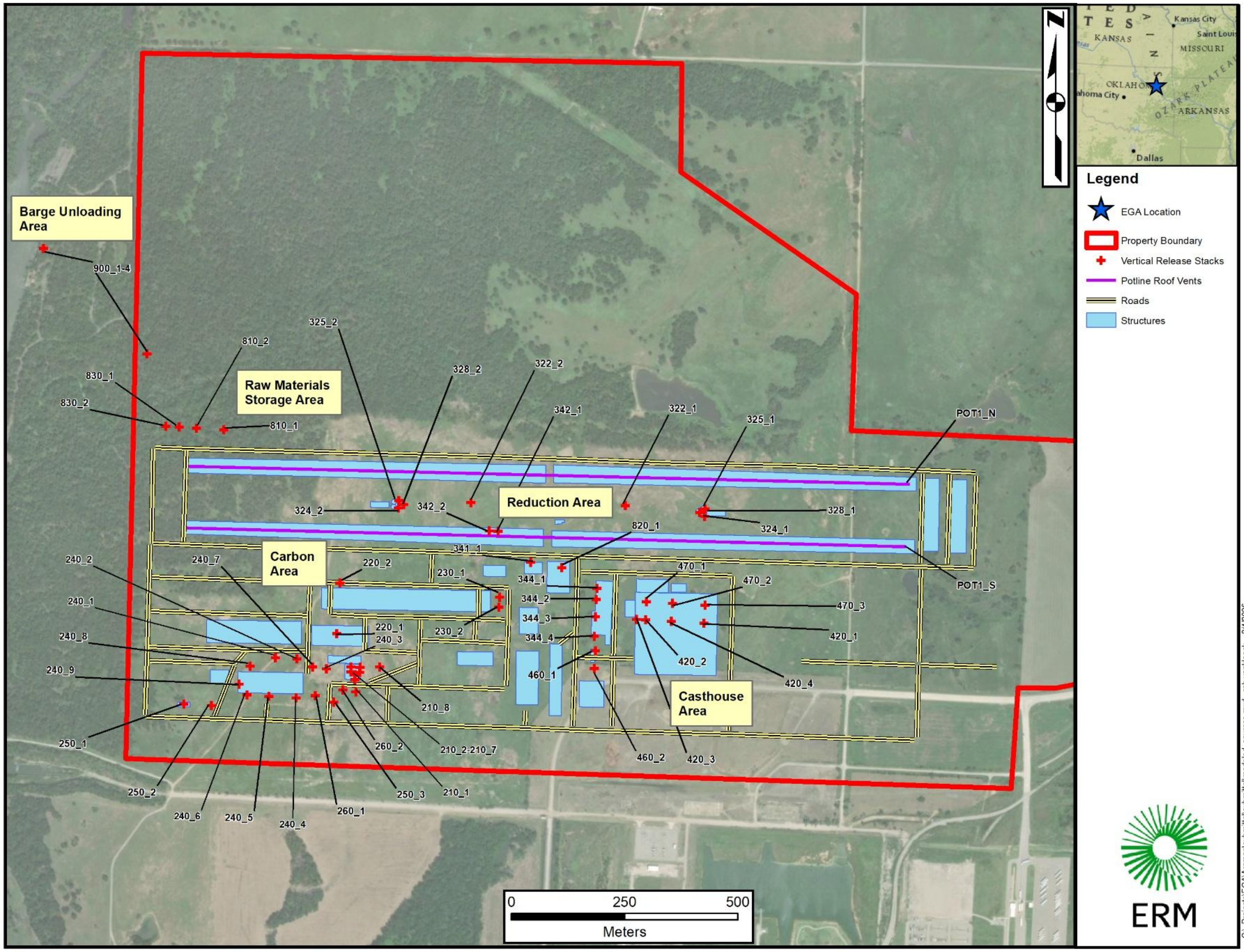
2.1 PROJECT SOURCES

As discussed in Section 1, Oklahoma Aluminum is submitting a permit application to authorize a new aluminum smelting facility. Emission sources associated with the Project will be associated with the following processes:

- **Reduction area** consisting of the Potline (ID 0320), Electrolytic Pots (ID 0322), Pot Tending Equipment (ID 0323), Fluorinated Alumina Storage and Handling (ID 0324), . Crushed Bath and Covering Material Storage (ID 0325), Covering Alumina Storage (ID 0326), fresh alumina silos (ID 0328), cathode rodding (ID 0341), pot delining/relining (ID 0342), and crucible cleaning (ID 0344)
- **Carbon area** consisting of Paste Plant (ID 0210), supply of coke and pitch (ID 0211), green anode cooling system (ID 0213), anode baking furnaces (ID 0230), anode cutting (0220), cast iron cooling water system (ID 0241-13), bath and anode butt handling/drying/recycling (ID 0240), bath material treatment and storage (ID-0250), and carbon recycling (ID 0260),
- **Casthouse area** consisting of alloyed ingot casting lines (ID 0420-2), wire rod casting lines (ID 0420-3), three Vertical Direct Chill casters (ID 0420-1&4), mold preheaters (ID 0430-1), casting conveyors, coating systems (ID 0430-2), cooling systems, drying fans, exhaust stacks (ID 0430-4, 0430-5), Cooling water treatment (ID 0430-3, 0450), Crucible skimming and treatment stations (ID 0460), and Dross treatment (ID 0470),
- **Raw materials storage area** consisting of a connected conveyor system (ID 0900), a fresh alumina handling and storage facility (ID 0810), 120-ton elevated feed bin (ID 0820), dust control systems (ID 0830),
- **Barge Unloading Area** consisting of a belt conveyor system (ID 0900)
- **Ancillary Operations** consisting of road transport fugitives (ID 0120)

A table summarizing the Project-related emission sources and the proposed emission rates, source parameters is included in Appendix B. This table also provides a cross-reference between the modeling identification numbers and the Emission Point Numbers (EPNs) listed in the NSR Workbook. Figure 2-1 shows the location of the emissions sources to be modeled.

FIGURE 2-1: MODELED SOURCES



3. IMPACT ASSESSMENT TOOLS AND TECHNIQUES

This section proposes modeling procedures pursuant to 40 CFR §52.21(k) to demonstrate that the Project will not cause or significantly contribute to a violation of any applicable NAAQS or Class II PSD Increment.

3.1 MODEL OPTIONS

The most recent versions of the AERMOD Modeling System components will be used at the time of the submittal, currently version 24142. These include the existing regulatory components (AERMOD, AERMET, AERMAP, and BPIPPRM) and the existing non-regulatory components (AERSURFACE).

AERMOD is the USEPA preferred refined dispersion model for evaluating impacts of land-based stationary sources within 50 km of the source. AERMOD is one of the listed refined dispersion models in USEPA's Guideline on Air Quality Models (40 CFR Part 51 Appendix W)[1] that are recommended for NSR and PSD programs.

AERMOD with Plume Rise Model Enhancement (PRIME) includes building downwash algorithms capable of modeling receptors in both the near-building wake (cavity) and far-building wake regions. The PRIME algorithm accounts for the distance from each building or structure to potentially affected sources in that building's region of influence. Cavity predictions within AERMOD removes a modeling discontinuity that existed with AERMOD without the PRIME algorithm and obviates the need for additional cavity impact analysis using the SCREEN3 model or other calculation procedures.

The following AERMOD control options will be used in the refined modeling analysis consistent with USEPA recommendations:

- Stack-tip downwash;
- Incorporate effects of elevated terrain;
- Missing data processing routine;
- Default wind profile exponents; and
- Vertical potential temperature gradients consistent with Rural and Urban options.
- All Project sources will be modeled at their actual release heights.

3.2 SOURCE CHARACTERIZATION

Emissions from the Project will be represented through a variety of approaches. Stationary emission sources will be modeled as vertical unobstructed release, represented by "POINT" source type in AERMOD. Emissions from the vent opening running along the top of the two potline buildings will be modeled using AERMOD's Buoyant Line and Point Source (BLP) algorithm, represented by "BUOYLINE" source type in AERMOD.

[1] USEPA. Guideline on Air Quality Models – 40 CFR Part 51 Appendix W, November 2024 epa.gov/system/files/documents/2024-11/appendix_w-2024.pdf

Buoyant line source type requires a set of modeling inputs, including physical roof vent parameters as presented in Table 3-1.

TABLE 3-1: POTLINE ROOF VENTS PHYSICAL PARAMETERS

Parameter	Parameter Description	Value	Unit
HB	Average building height	13.845	m
L	Average building length	800.00	m
WB	Average building width	28.87	m
WM	Average line source width	TBD	m
Dx	Average building separation	109.385	m
Hs	Release height	TBD	m

In addition to physical dimensions of the potline structure, a buoyancy flux parameter (FPRIME or F') is required as an input to AERMOD. Table 3-2 shows a list of parameters for calculating FPRIME and is computed using Equation 1.

Equation 1:

$$F' = \frac{g\ L\ W_m\ w(Ts - Ta)}{Ts}$$

Some of the listed parameters are not available at the time of the protocol submittal as they are derived with a Computational Fluid Dynamics model and/or provided by an equipment vendor (marked as "TBD" in Table 3-1 and Table 3-2). A complete set of inputs and FPRIME calculations will be provided in the report submittal.

TABLE 3-2: POTLINE ROOF VENTS BUOYANCY FLUX CALCULATIONS

Parameter	Parameter Description	Value	Unit
g	Gravity Acceleration	9.81	m/s2
L	Source length	1600.00	m
Wm	Source width	TBD	m
w	Source flow rate	TBD	m/s
Ta	Average ambient temperature (1)	288.43	K
Ts	Average source temperature	TBD	K
Ts-Ta	Average delta temperature (source minus ambient)	TBD	K
F'	Average buoyancy parameter	TBD	m4/s3

(1) The average ambient temperature was computed from the Inola Mesonet meteorological file for years 2011-2015.

OA has outlined several haul roads on the property to transport alumina and anodes to the reduction area. As described in the OKDEQ modeling guidelines Section 2.1.4.1[2], haul roads will be represented as a series of adjacent volume sources with dimensions based on vehicle width and height. Because current vehicle type information is limited, the haul trucks will be preliminarily assumed to be 3 meters tall and wide, with single lane traffic only. Table 3-3 below highlights the resulting volume source calculations that will be used for all roads. If road segment variability becomes established by OA, these variables will be adjusted based on new vehicle or road information. Preliminary emission rates on a segment-by-segment basis are shown in Appendix B.

[2] OKDEQ. Air Dispersion Modeling Guidelines, June 2017

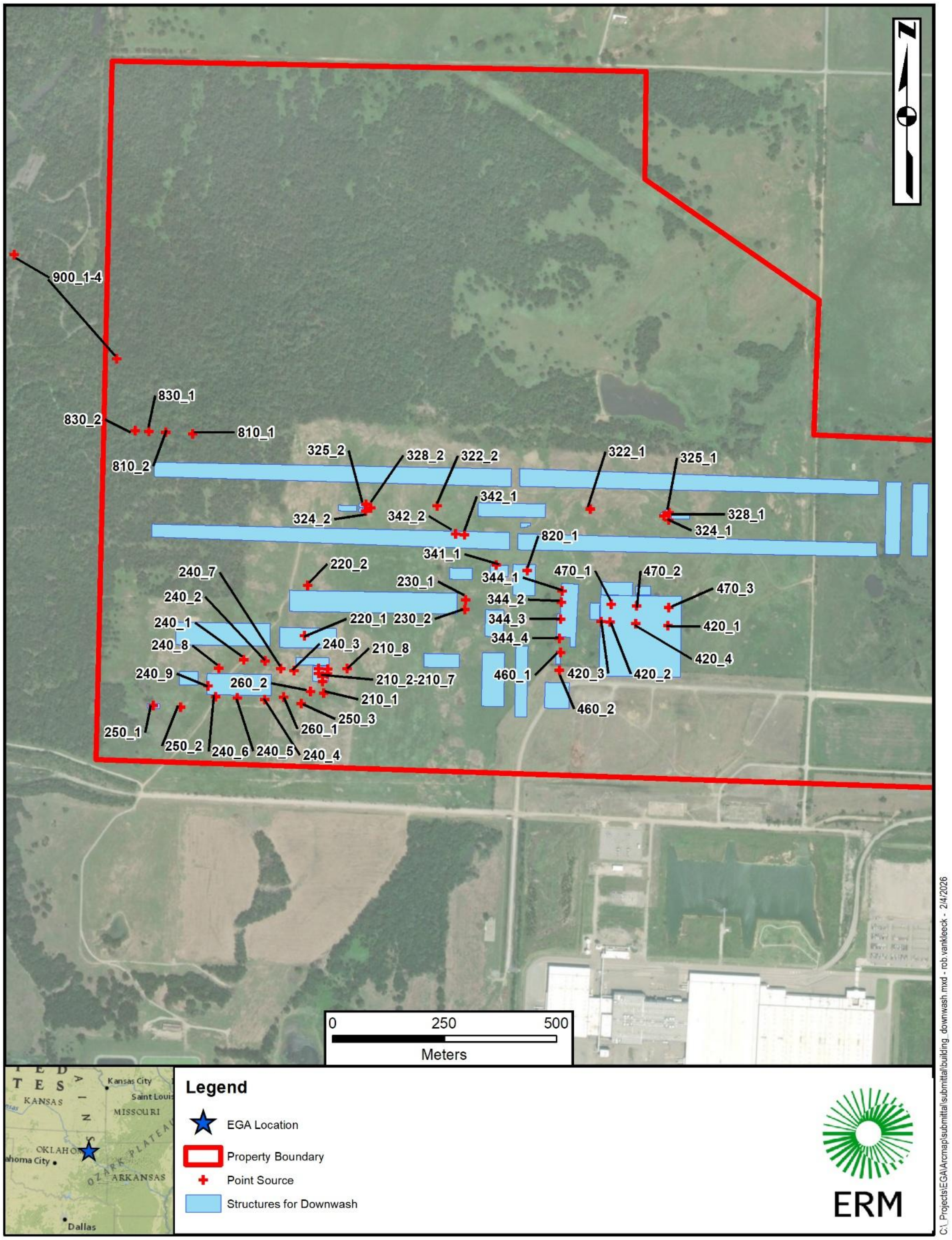
TABLE 3-3: VOLUME SOURCE INPUT PARAMETERS CALCULATIONS

Parameter	Parameter Description	Value	Unit
Vh	Vehicle height	3.0	m
Vw	Vehicle width	3.0	m
Pw	Plume width	9.0	m
Ph	Plume height	5.1	m
RH	Release height	2.55	m
σ_{yo}	Initial horizontal dimension	4.19	m
σ_{zo}	Initial vertical dimension	2.37	m

3.3 DOWNWASH ANALYSIS

The USEPA's Building Profile Input Program (BPIP), Version 04274, will be used to calculate downwash effects for the modeled point emission sources. Figure 3-1 shows a preliminary location of the sources relative to the structures, and Appendix A contains the layout drawing. The point sources are expected to have stack heights below the greater of the Good Engineering Practice (GEP) formula height calculated by BPIP or 65 meters (213 feet). Building dimensions data output from BPIP will be input into AERMOD to represent aerodynamic downwash effects on all the point sources located at the facility.

FIGURE 3-1: LOCATION OF SOURCES AND STRUCTURES FOR DOWNWASH ANALYSIS



3.4 NO2 TO NOX CONVERSION

OA will use the Tier 2 option to convert NOx to NO2. A default minimum ambient ratio of 0.5 and the maximum ambient ratio of 0.9 will be used.

3.5 SECONDARY $PM_{2.5}$ FORMATION ANALYSIS

OA's impacts of secondary PM2.5 concentrations, resulting from precursor emissions of NOX and SO2, was estimated using the USEPA's Modeled Emission Rates for Precursors (MERPs) analysis.

OA used the first-tier assessment following the latest USEPA's guidance from April 30, 2024[3]. USEPA provides a MERPs View Qlik Tool[4] for identifying a representative hypothetical source and using the hypothetical source modeled impacts on PM2.5 to estimate Project secondary PM2.5 impacts. Table 3-4 shows the MERPs for the most representative hypothetical source (e.g., 1000 tpy for SO2, 500 tpy for NO2, and 90 meter stack) located nearest to the Project. The Muskogee County hypothetical source in Oklahoma is approximately 40 km south of the Project; both sites are in a relatively flat terrain with light development nearby. The results of the MERPs View Qlik Tool are also summarized in Table 3-4 for Class II modeling. Class I secondary will be addressed in the Class I modeling protocol.

TABLE 3-4: EPA MERPS VIEW QLIK OUTPUT FOR PM2.5 ANALYSIS

State	County	Metric	Precursor	Emission (tpy)	Stack (m)	USEPA Max Modeled PM2.5 Concentration (µg/m3)
Oklahoma	Muskogee	Annual PM2.5	NOx	500	90	0.002
Oklahoma	Muskogee	Annual PM2.5	SO2	1000	90	0.008
Oklahoma	Muskogee	Daily PM2.5	NOx	500	90	0.054
Oklahoma	Muskogee	Daily PM2.5	SO2	1000	90	0.672

The secondary formation of PM2.5 from pre-cursor emissions of NOx (316.20 tpy) and SO2 (1520.08 tpy) from the Project were computed using Equation 2 below from the 2024 guidance[3] and hypothetical source data from Table 3-4.

Equation 2:

Project Air Quality Impact = Project emissions * (modeled air quality impact from hypothetical source / modeled emissions rate from hypothetical source)

[3] USEPA. Supplement to the Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program. April 30, 2024. Available at: epa.gov/system/files/documents/2024-04/supplement-to-the-guidance-on-significant-impact-levels-for-ozone-and-fine-particles-in-the-psd-permitting-program-4-30-2024.pdf

[4] USEPA. MERPs View Qlik Tool, 2024 https://www.epa.gov/scram/merps-view-qlik

- *24-hour PM2.5 Secondary Project Air Quality Impact*

NOx Project Air Quality Impact = 316.20 tpy * (0.054 μg/m3 / 500 tpy) = 0.0343 μg/m3

SO2 Project Air Quality Impact = 1520.08 tpy * (0.672μg/m3 / 1000 tpy) = 1.0222 μg/m3

Total PM2.5 secondary (due to NOx & SO2) 24-hour Project Air Quality Impact =

0.0343 μg/m3 + 1.0222 μg/m3 = 1.06 μg/m3

The calculated amount of 1.06 μg/m3 will be added to the primary PM2.5 modeled concentration before comparing to the Class II SILs, NAAQS, and PSD thresholds to account for the contribution of 24-hour secondary PM2.5.

- *Annual PM2.5 Secondary Project Air Quality Impact*

NOx Project Air Quality Impact = 316.20 tpy * (0.002 μg/m3 / 500 tpy) = 0.0015 μg/m3

SO2 Project Air Quality Impact = 1520.08 tpy * (0.008 μg/m3 / 1000 tpy) = 0.0122 μg/m3

Total PM2.5 secondary (due to NOx & SO2) Annual Project Air Quality Impact =

0.0015 μg/m3 + 0.0122 μg/m3 = 0.01 μg/m3

The calculated amount of 0.01 μg/m3 will be added to the primary annual PM2.5 modeled concentration before comparing to the Class II SILs, NAAQS, and PSD thresholds to account for the contribution of annual secondary PM2.5.

Contribution of secondary PM2.5 from offsite sources is already accounted for in the measured ambient concentrations.

3.6 OZONE IMPACT ANALYSIS

The Project impacts on ozone formation from precursor emissions of VOC and NOx were estimated using MERPs first-tier assessment. Table 3-5 shows the MERPs for the most representative hypothetical source located nearest to the Project. The Muskogee County hypothetical source in Oklahoma (e.g., 500 tpy for NOx, 1000 tpy for VOC and 90 meter stack) is approximately 40 km south of OA, both in a flat terrain.

TABLE 3-5: EPA MERPS VIEW QLIK OUTPUT FOR OZONE ANALYSIS

State	County	Metric	Precursor	Emission (tpy)	Stack (m)	USEPA Max Modeled Ozone Concentration (ppb)
Oklahoma	Muskogee	8-hr Ozone	NOx	500	90	1.429
Oklahoma	Muskogee	8-hr Ozone	VOC	1000	90	0.274

Ozone concentrations from pre-cursor emissions of NOx (316.20 tpy) and VOC (217.58 tpy) Project emissions was computed using Equation 2 above from the 2024 guidance[3] and hypothetical source data from Table 3-5.

8-hour Ozone Secondary Project Air Quality Impact

NOx Project Air Quality Impact = 316.20 tpy * (1.429 parts per billion [ppb] / 500 tpy) = 0.9035 ppb

VOC Project Air Quality Impact = 217.58 tpy * (0.274 ppb / 1000 tpy) = 0.0596 ppb

Total secondary ozone (due to NOx & VOC) Project Air Quality Impact =

0.9035 ppb + 0.0596 ppb = 0.963 ppb

The Project's preliminary ozone impacts are estimated to be 0.963 ppb, which is lower than the ozone SIL of 1 ppb. The representative background concentration of ozone was established to be 65 ppb based on the Cherokee Heights monitor (AQS Site 40-097-9014). Section 6.4 and Appendix C provide monitor justification analysis. When added to the background concentration, the resulting total concentration including secondary ozone is 65.963 ppb, below the NAAQS threshold of 70 ppb. Therefore, the Project cumulative ozone concentrations are below the NAAQS and demonstrate compliance with NAAQS.

4. AREA MAPS AND FACILITY PLOT PLANS

The Project will be located in Rogers County, Oklahoma, approximately 40 kilometers (25 miles) east of the city of Tulsa (36°07'22"N 95°33'18"W), and approximately 200 kilometers (125 miles) North-East of Oklahoma City.

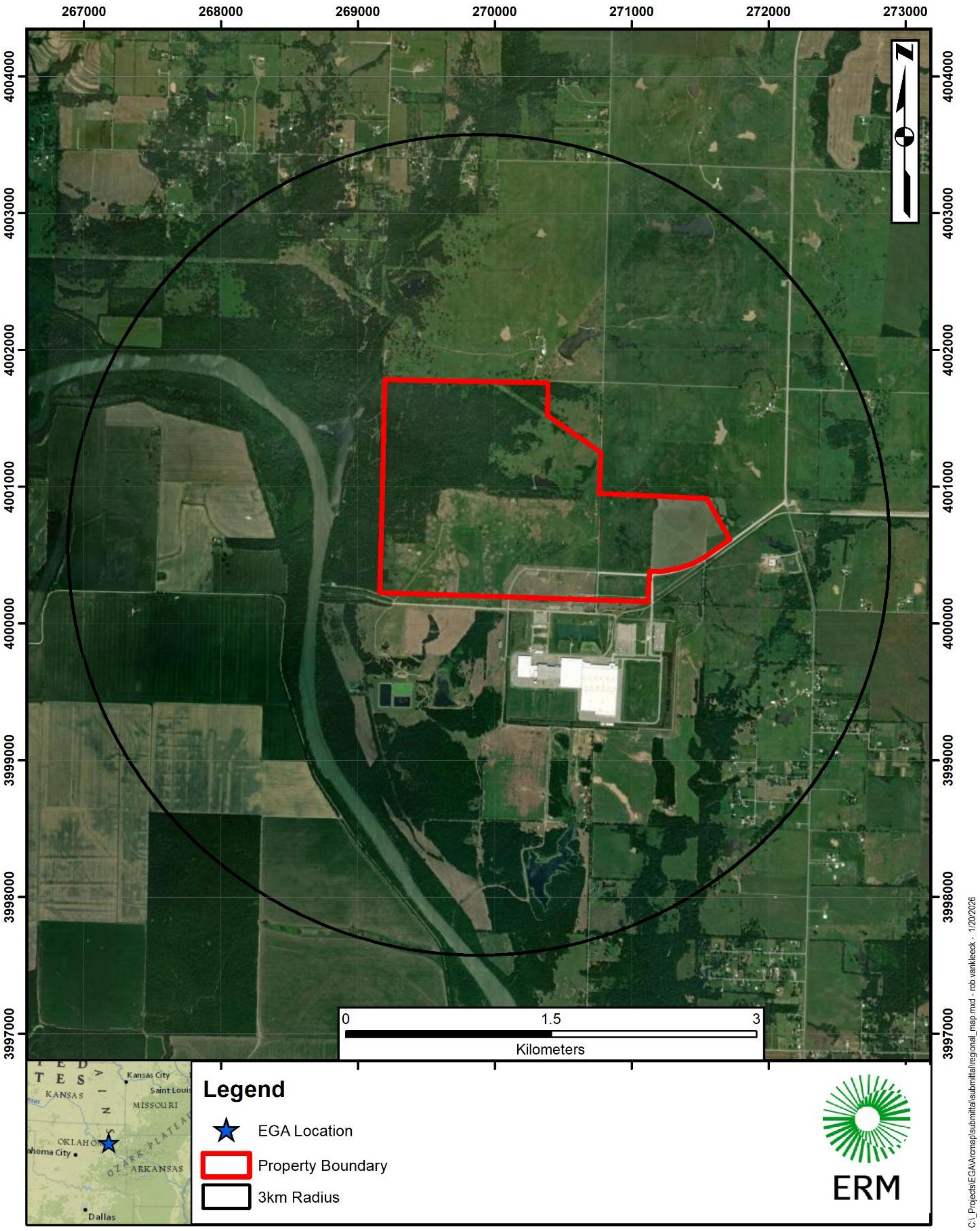
The detailed proposed site plot plan is included as Appendix A.

Figure 4-1 below shows the property boundary and the surrounding area. OA plans to enclose the entire boundary with a fence. For any reason, if some sections of the boundary will not contain a fence, they will have guard shack(s), signage, video surveillance or other means to preclude public access.

The location of downwash structures and emissions points are identified in Figure 2-1.

There are three PSD Class I areas within 300 km of the Project site: Upper Buffalo Wilderness Area, Caney Creek Wilderness area, and Hercules-Glades Wilderness area. Upper Buffalo and Caney Creek are in Arkansas, while Hercules-Glades is in Missouri. The analysis for these facilities is discussed in Section 10.4.

FIGURE 4-1: REGIONAL MAP OF THE OKLAHOMA ALUMINUM AREA



5. OFFSITE MODELING EMISSIONS INVENTORY

If model-predicted concentrations exceed the Class II modeling SIL for a pollutant, then a full impact analysis will be performed for that pollutant and averaging period to determine compliance with the NAAQS and Class II Increment levels as listed in 40 CFR §52.21. First, a significant impact area (SIA) will be defined based on the extent of predicted impacts associated with Project-only emissions in excess of the applicable SIL.

OKDEQ modeling guidance specifies offsite inventories should extend at least 20 km from the Project. Due to the size of the facility and the expected SIAs, emissions data for all off-site sources within 50 km of the Project site were requested and received from OKDEQ. Emissions from the sources were actual emission rates over the most recent three years (2022-2024). In accordance with Table 8-2 of EPA's Guideline of Air Quality Models[1], an average the most recent two years of these data will be used to calculate annual averaging period emission rates.

In some cases, such as testing and startup/shutdown scenarios, these actual emissions may underpredict short-term emission rates. Therefore, for either sources close to the facility or those with significant emissions within the domain, OKDEQ provided operating permits to integrate allowable emissions directly from the permit for short-term modeling demonstrations. Since ERM has conducted much of the offsite refinement required for the modeling demonstration, the preliminary inventory will be submitted to OKDEQ ahead of the full submittal for review and approval. To be conservative and keep the inventory as simple as possible, the NAAQS and PSD Increment demonstrations will use the same sources and emission rates.

The emission inventory is still under development and will be provided to OKDEQ separately for review. All calculations and edits made to the original data will be clearly indicated and traceable.

6. AIR QUALITY MONITORING DATA FOR NAAQS COMPLIANCE

A key aspect of NAAQS compliance is the use of ambient background concentrations. These data assess criteria pollutant concentrations in the ambient air separate from Project emissions. Therefore, ambient background data must be reflective of the ambient air surrounding the proposed Project to demonstrate that no NAAQS exceedances will take place.

It is expected that Oklahoma Aluminum will be significant for all criteria pollutants and thus will require NAAQS modeling where Project impacts will be added to the ambient background concentrations. Background concentrations representative of the Project modeling domain were obtained from the most recent three years (2022-2024) of monitoring data available from the most representative monitoring location for the Project site.

The representativeness of each monitoring site were discussed with OKDEQ and justified based upon USEPA guidance contained in Section 8.2 (Background Concentrations) of the "Guideline on Air Quality Models"[1] and Section 2.4 (Use of Representative Air Quality Data) of the "Ambient Monitoring Guidelines for PSD".[5] This guidance was also supplemented with OKDEQ's own modeling guidance, specifically Section 2.2.7 which outlines requirements for monitoring data[2].

Multiple criteria were considered in evaluating the representativeness of ambient background data from air quality monitoring sites:

1. Monitor location relative to the Project site and maximum impact areas;
2. Quality of the data;
3. Timeliness of the data;
4. Quantity and type of emissions near the monitor;
5. Population near monitor compared to OA

The quality of the data from the chosen monitoring sites meets USEPA of 75 percent completeness per quarter. Table 6-1 shows the proposed ambient background concentrations to be used in the cumulative impact analysis and Figure 6-1 shows their locations. Sections 6-1 through 6-6 below discuss the monitor justifications in detail. The full NAAQS assessment methods are described in Section 1.4.

Preliminary approval from OKDEQ for the ambient monitor selection and design values were provided to ERM on December 3rd 2025. OKDEQ requested further justification for the ozone monitor selection, which is presented in Appendix C.

6.1 AMBIENT MONITORING STATION JUSTIFICATION FOR NO2

For NO2, OA proposes to use the Tulsa Central Monitor (ID 40-143-1127) in Tulsa County as a representative background monitor for the Project. Situated just north of Downtown Tulsa, the monitor yields conservative NO2 measurements reflective of urban sources and a more developed

[5] USEPA. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), USEPA-450/4/87/007, May 1987
epa.gov/sites/default/files/2015-07/documents/monguide.pdf

region than Rogers County. The monitor is only 39 km away from the Project site, and with no other NO2 monitors nearby, OA believes this monitor is the clear choice to demonstrate compliance with the 1-hr and annual NO2 NAAQS.

6.2 AMBIENT MONITORING STATION JUSTIFICATION FOR SO2

For SO2, OA proposes to use the Tulsa Central Monitor (ID 40-143-1127) in Tulsa County as a representative background monitor for the Project. This monitor also provides conservative SO2 measurements at an urban scale. OA believes this monitor is appropriate for demonstrating compliance with the 1-hr SO2 NAAQS.

6.3 AMBIENT MONITORING STATION JUSTIFICATION FOR CO

For CO, OA proposes to use the Tulsa Central Monitor (ID 40-143-1127) in Tulsa County as a representative background monitor for the Project. This monitor also provides conservative CO measurements at an urban scale, and there are no other CO monitors within 100km. OA believes this monitor is appropriate for demonstrating compliance with the 1-hr and 8-hr CO NAAQS.

6.4 AMBIENT MONITORING STATION JUSTIFICATION FOR OZONE

For ozone, OA proposes to use the Cherokee Heights monitor (ID 40-097-9014) in Mayes County as a representative background monitor for the Project. This monitor is in a rural/lightly developed setting about 29 km east of the Project site. The land use is very similar between the Project and the monitor location, with predominantly forested undeveloped space intercut with light development and residences. OA believes the Cherokee Heights monitor provides the appropriate ozone data to show compliance with the NAAQS. Further justification for this monitor selection is provided in Appendix C.

6.5 AMBIENT MONITORING STATION JUSTIFICATION FOR PM10

For PM10, OA proposes to use the Tulsa Central Monitor (ID 40-143-1127) in Tulsa County as a representative background monitor for the Project. This monitor also provides conservative PM10 measurements at an urban scale, and there are no other PM10 monitors within 100km. OA believes this monitor is appropriate for demonstrating compliance with the 24-hr PM10 NAAQS.

6.6 AMBIENT MONITORING STATION JUSTIFICATION FOR PM2.5

For PM2.5, OA proposes to use the Glenpool Monitor (ID 40-143-0174) in Tulsa County as a representative background monitor for the Project. This monitor is located just south of downtown Tulsa about 44km away from the Project site. The monitor’s proximity to downtown Tulsa yields suitably conservative PM2.5 measurements representative of Inola and other exurbs of the Tulsa metropolitan area. OA believes this monitor is appropriate for demonstrating compliance with the 24-hr and annual PM2.5 NAAQS. A discussion of exceptional events to refine measured concentrations is included in the section below.

6.6.1 EXCEPTIONAL EVENTS JUSTIFICATION

Exceptional events are unusual or naturally occurring events that affect air quality and are not reasonably controllable or preventable. States can request that EPA not consider air quality data affected by an exceptional event when determining if an area met an air quality health standard. EPA has stated that events that affect air quality such as wildfires, prescribed fires, high winds blowing dust, dust from the Saharan Desert, fireworks to celebrate days such as July 4th, etc., can be considered exceptional events, as documented in the 2016 Exceptional Event Rule[6].

The DEQ has not submitted the exceptional events demonstration to EPA because all monitors in Oklahoma are currently in attainment with the annual PM2.5 NAAQS of 9 μg/m3. The PM2.5 Glenpool 2024 design concentration is 8.0 μg/m3, leaving very little margin for the Project primary, Project secondary, and offsite sources' impacts. Review of the Glenpool daily monitoring data, as displayed in Figure 6-2, shows multiple days (orange and brown dots) exceeding normal historical fluctuation (blue dots). Excluding such days from the dataset would reduce the 2024 design values from 8.0 μg/m3 to about 7.3 μg/m3. OA proposes to provide evidence and justification documentation that the Glenpool monitor was affected by dust and smoke during these exceptional events. The demonstration will follow the criteria outlined in the 40 CFR §50.14(c)(3)(iv) in the 2016 Exceptional Event Rule to demonstrate an exceptional event:

- A narrative conceptual model describing the event causing the exceedance with details of how those emissions transported to and affected Glenpool monitor;
- A demonstration of a clear causal relationship between the event and monitored exceedance;
- Historical concentration comparison of the affected monitor prior to and during the event;
- Evidence that the exceedance was attributed to a natural event or other exceptional event which was not reasonably controllable and not reasonably preventable.

A separate justification document with the above criteria will follow at a later date.

---

[6] USEPA Treatment of Data Influenced by Exceptional Events. October 3, 2016. https://www.epa.gov/air-quality-analysis/final-2016-exceptional-events-rule-supporting-guidance-documents-updated-faqs

TABLE 6-1: PROPOSED AMBIENT BACKGROUND CONCENTRATIONS (µg/m3)

Pollutant	Averaging Period	Monitor Name	AQS ID	City, State	County	Monitor Scale	Distance to OA (km)	2022-2024 Design Conc. (µg/m3)	NAAQS (µg/m3)
CO	1-hr	Tulsa Central	40-143-1127	Tulsa, OK	Tulsa	Urban	39	1488.3[2]	40,000
	8-hr							801.4[2]	10,000
NO_2	1-hr	Tulsa Central	40-143-1127	Tulsa, OK	Tulsa	Urban	39	63.9	188
	Annual							11.3	100
PM_{10}	24-hr	Tulsa Central	40-143-1127	Tulsa, OK	Tulsa	Urban	39	101[2]	150
$PM_{2.5}$	24-hr	Glenpool	40-143-0174	Glenpool, OK	Tulsa	Urban	44.5	19.0	35
	Annual							8.0 [1]	9
SO_2	1-hr	Tulsa Central	40-143-1127	Tulsa, OK	Tulsa	Urban	39	7.9	196
O_3	8-hr	Cherokee Heights	40-097-9014	Pryor, OK	Mayes	Neighborhood	29.8	127.6	137.4

(1) OA is proposing to remove exceptions events associated with natural events or human activity unlikely to recur at a particular location in
luce the design concentration below 8.0 µg/m3.
(2) Denotes design values provided by Joseph Wills of OKDEQ on December 3, 2025. All other values were obtained via the 2024 EPA Design
https://wepa.gov/air-trends/air-quality-design-values

FIGURE 6-1: AMBIENT MONITOR LOCATIONS COMPARISON WITH PROJECT

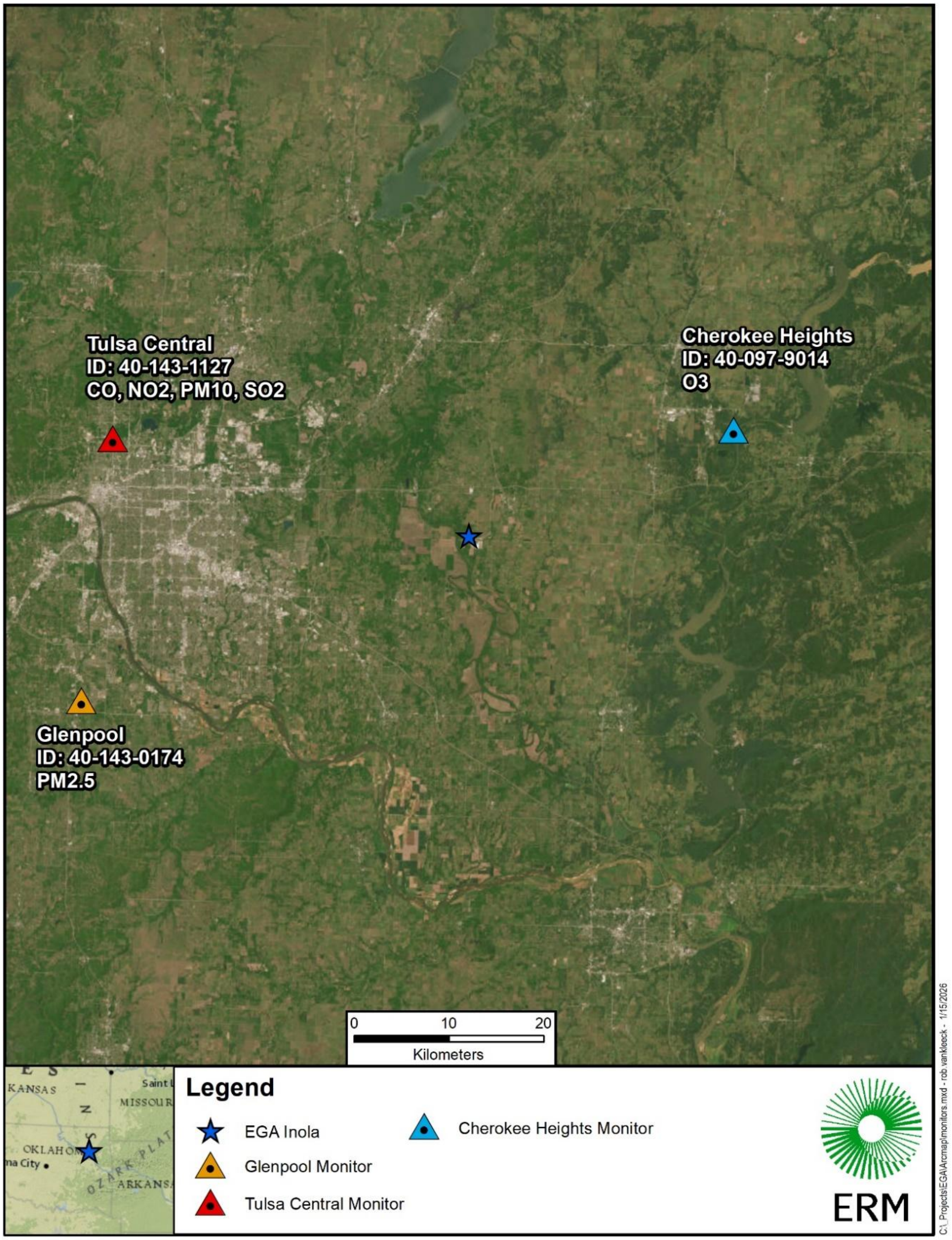
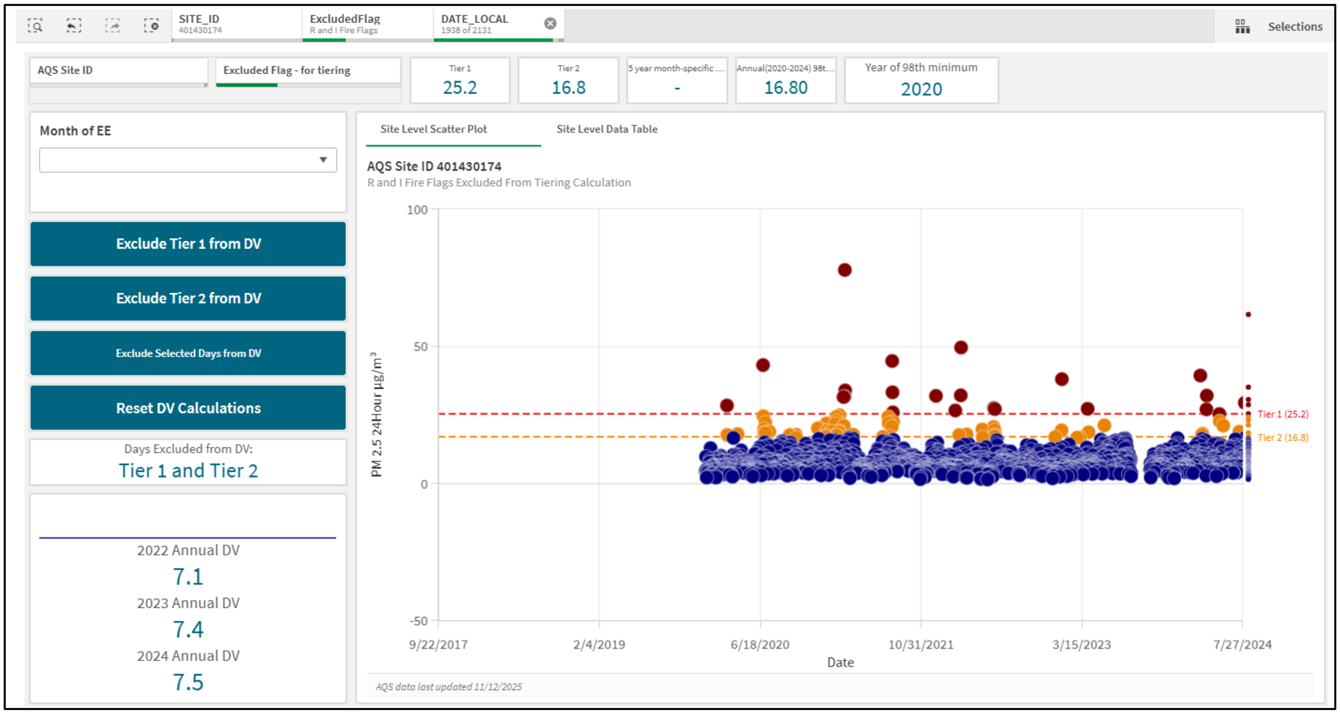


FIGURE 6-2: GLEPOOL MONITOR PM2.5 ANNUAL DESIGN VALUE ADSUTMENT AFTER REMOVAL OF TIER 1 AND TIER 2 EXEPTIONAL EVENTS



Source: USEPA PM2.5 tiering tool for exceptional events analysis, available at https://www.epa.gov/air-quality-analysis/pm25-tiering-tool-exceptional-events-analysis

6.7 PRE-CONSTRUCTION AMBIENT MONITORING REQUIREMENT

A preconstruction ambient air monitoring waiver must be requested 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 USEPA's Significant Monitoring Concentrations (SMCs) in 40 Code of Federal Regulations (CFR) §52.21. The applicable SMCs are summarized in Table 6-2. If a Project cannot be exempted from preconstruction monitoring based on modeling results, then the applicant may propose the use of existing monitoring data in lieu of performing preconstruction monitoring for any pollutant with preliminary impacts analysis results greater than SMC values. OA utilized representative regional background data from representative monitoring sites for relevant criteria pollutants, and this is discussed in the sections above.

TABLE 6-2: SIGNIFICANT MONITORING CONCENTRATIONS (μg/m3)

Pollutant	Averaging Period	Significant Monitoring Concentration
SO_2	24-hour	13
CO	8-hour	575
NO_2	Annual	14
PM_{10}	24-hour	10

7. LAND USE

7.1 SELECTION OF DISPERSION OPTION

For any dispersion modeling exercise, the determination of whether a source is in an "urban" or "rural" area is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is also important because AERMOD invokes a 4-hour half-life for urban SO_2 sources.

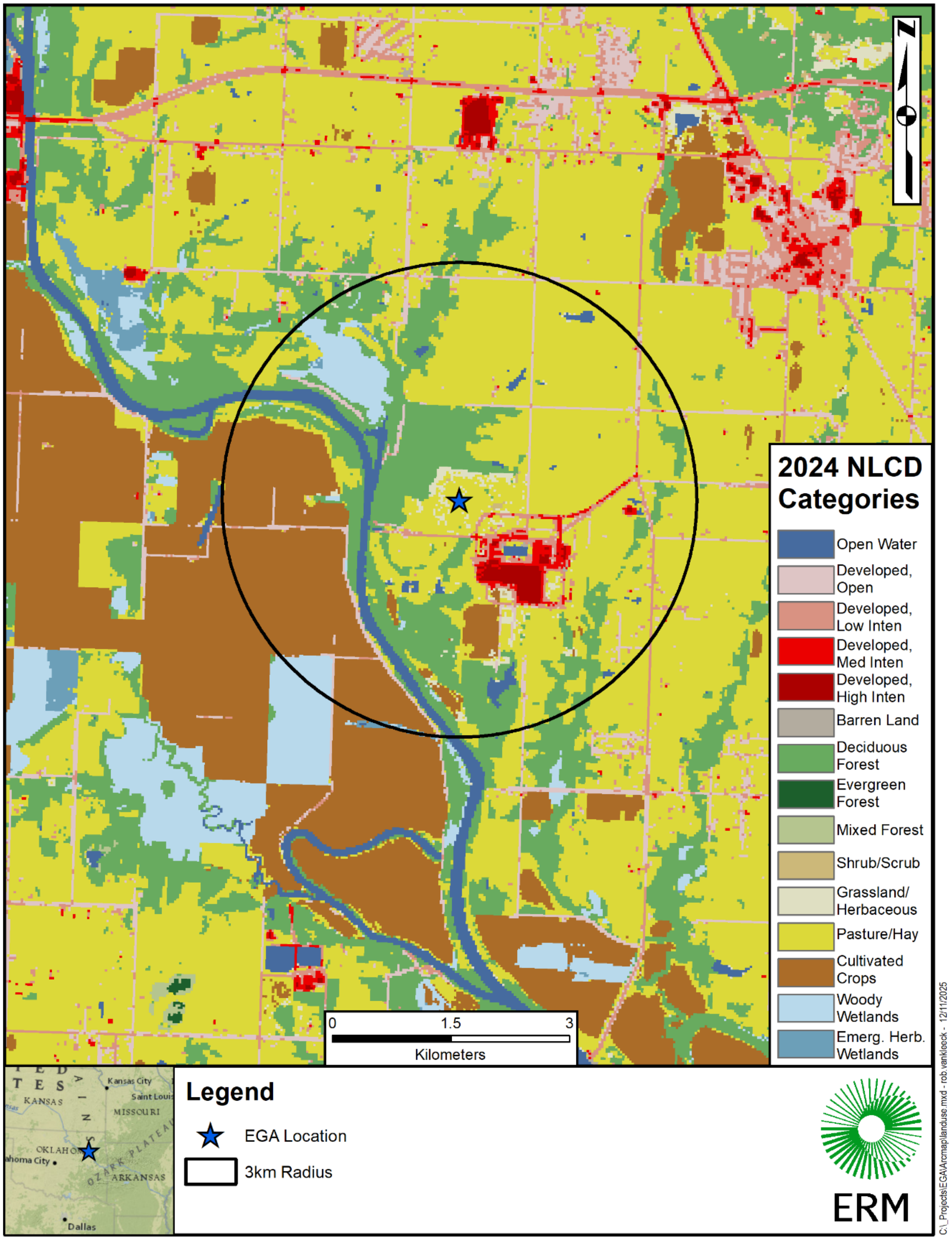
Except for the industrial area comprised of the proposed Project and adjacent papermill, the region is rural in nature. The Auer land use classification procedure[7] indicates that the area circumscribed by a 3 km radius circle centered about the Project is dominated by rural land use types (97.8%), with less than 3% of urban land-use types. Table 7-1 and Figure 7-1 show detailed breakdown of each land use type based on the United States Geological Survey 2024 National Land Cover Database.

TABLE 7-1: LAND-USE DISTRIBUTION WITHIN 3-KM STUDY AREA CENTERED AT THE PROJECT

Land-use Category	Land Category Description	Number of Grid Cells	Frequency (%)	Dispersion Type
11	Open Water:	1145	3.64%	Rural
21	Developed, Open Space:	1093	3.48%	Rural
22	Developed, Low Intensity:	763	2.43%	Rural
23	Developed, Medium Intensity:	396	1.26%	Urban
24	Developed, High Intensity:	304	0.97%	Urban
31	Barren Land (Rock/Sand/Clay):	16	0.05%	Rural
41	Deciduous Forest:	6574	20.93%	Rural
43	Mixed Forest:	1	0.00%	Rural
52	Shrub/Scrub:	26	0.08%	Rural
71	Grasslands/Herbaceous:	477	1.52%	Rural
81	Pasture/Hay:	14878	47.36%	Rural
82	Cultivated Crops:	4747	15.11%	Rural
90	Woody Wetlands:	955	3.04%	Rural
95	Emergent Herbaceous Wetland:	38	0.12%	Rural
TOTAL		31413		
			2.23%	Urban
			97.77%	Rural

7 A. H. Auer, "Correlation of Land Use and Cover with Meteorological Anomalies" (Auer, 1978).

FIGURE 7-1: LAND USE IN THE OKLAHOMA ALUMINUM AREA



7.1.1 URBAN OPTION JUSTIFICATION

OA is proposing to treat certain Project sources with urban dispersion due to the heat island expected to occur as a result of the potline operations. Urban option approach is routinely approved by EPA for heavy industry facilities, including for aluminium smelting facilities like Alcoa Warrick, Indiana and Alcoa Intalco, Washington[8,9].

It is worth noting that the urban dispersion in AERMOD is applied on a source-by-source basis and is not sensitive to the effective population size for buoyant source type. Urban influence in AERMOD is scaled based on a user-specified population only for point and volume source type used in this analysis. Therefore, OA proposes to apply urban dispersion option to the following sources only:

- Potline roof vents (ID 321-1/POT1_N and 321-2/POT1_S) modeled as buoyant line source type.
- GTC stacks (ID 322-1 and 322-2) modeled as point source type with the effective population of 2,000,000. The GTC stacks are located between the potline buildings.
- Certain roads segments modeled as volume source type with the effective population of 2,000,000. The roads segments considered are to be located between and immediately around the potline buildings (segment IDs to be determined later).

This section presents the justification for this position. Key references for this justification are the U.S. EPA's Guideline on Air Quality Models (GAQM), found at 40 CFR Appendix W (Section 7.2.1.1); the AERMOD model formulation document (MFD, 2019)[10]; the AERMOD Implementation Guide[11]; and literature references as noted in this section[12,13,14].

The GAQM contains guidance on determining whether AERMOD should be run in the rural or urban mode. The relevant parts of Section 7.2.1.1 are shown here (emphasis added):

a. For any dispersion modeling exercise, the urban or rural determination of a source is critical in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. Historically, steady-state Gaussian plume models used in most applications have employed dispersion coefficients based on Pasquill-Gifford in rural areas and McElroy-Pooler in urban areas. These coefficients are still incorporated in the BLP and OCD models. However, the AERMOD model incorporates a more up-to-date characterization of the atmospheric boundary layer using continuous functions of parameterized horizontal and vertical turbulence based on Monin-Obukhov similarity (scaling) relationships.

---

[8] USEPA Technical Support Document: Chapter 13 Final Round 3 Area Designations for the 2010 1-Hour SO2 Primary National Ambient Air Quality Standard for Indiana. Available at https://www.regulations.gov/document/EPA-R05-OAR-2023-0564-0007

[9] USEPA Technical Support Document: Chapter 10 Intended Round 4 Area Designations for the 2010 1-Hour SO2 Primary National Ambient Air Quality Standard for Washington. Available at https://www.epa.gov/sites/default/files/2020-08/documents/10-wa-rd4_intended_so2_designations_tsd.pdf

[10] USEPA, November 2024. AERMOD Model Formulation. Office of Air Quality Planning and Standards, Research Triangle Park, NC. Available at: https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_mfd.pdf

[11] USEPA, November 2024. AERMOD Implementation Guide. Office of Air Quality Planning and Standards, Research Triangle Park, NC. Available at: https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_implementation_guide.pdf

[12] R. Paine et al. *Source characterization refinements for routine modeling applications*/ Atmospheric Environment 129 (2016) 55e67

[13] Oke, T. R., 1973: City size and the urban heat island. *Atmospheric.Environment*, 7, 769-779.

[14] Oke, T. R., 1982: The energetic basis of the urban heat island. *Quart.J.Roy.Meteor.Soc.*, 108, 124.

Another key feature of AERMOD's formulation is the option to use directly observed variables of the boundary layer to parameterize dispersion.

b. The selection of rural or urban dispersion coefficients in a specific application should follow one of the procedures suggested by Irwin to determine whether the character of an area is primarily urban or rural (of the two methods, the land use procedure is considered more definitive.

> ***i. Land Use Procedure: (1) Classify the land use within the total area, Ao, circumscribed by a 3 km radius circle about the source using the meteorological land use typing scheme proposed by Auer; (2) if land use types I1, I2, C1, R2, and R3 account for 50 percent or more of Ao, use urban dispersion coefficients; otherwise, use appropriate rural dispersion coefficients.***
>
> ***ii. Population Density Procedure: (1) Compute the average population density, $\bar{p}$ per square kilometer with Ao as defined above; (2) If $\bar{p}$ is Greater than 750 people per square kilometer, use urban dispersion coefficients; otherwise use appropriate rural dispersion coefficients.***

c. Population density should be used with caution and generally not be applied to highly industrialized areas where the population density may be low and, thus, a rural classification would be indicated. However, the area is likely to be sufficiently built-up so that the urban land use criteria would be satisfied. Therefore, in this case, the classification should be ''urban'' and urban dispersion parameters should be used.

d. For applications of AERMOD in urban areas, under either the Land Use Procedure or the Population Density Procedure, the user needs to estimate the population of the urban area affecting the modeling domain because the urban influence in AERMOD is scaled based on a user-specified population. ***For non-population oriented urban areas, or areas influenced by both population and industrial activity, the user will need to estimate an equivalent population to adequately account for the combined effects of industrialized areas and populated areas within the modeling domain. Selection of the appropriate population for these applications should be determined in consultation with the appropriate reviewing authority (paragraph 3.0(b)) and the latest version of the AERMOD Implementation Guide.***

The latest version of the AERMOD implementation describes the urban effect in terms of a heat island, stemming primarily from the fact that buildings and concrete surfaces in the urban area retain heat from daytime solar radiation and release it more slowly than surrounding rural areas, causing an increase in temperature that in turn affects atmospheric dispersion. The effect of the heat released at night is to create what is referred to in the MFD as a "convective-like" boundary layer, with a higher effective mixing depth and greater turbulence than in rural areas. These effects on boundary layer characteristics, noted in the MFD, are not present during the daytime.

Based on the reasons stated above, urban dispersion option is more appropriate because of a localized urban heat island effect created by hot, industrial operations, such as the OA smelter. The Guideline on Air Quality Modeling (40 CFR Part 51 Appendix W) acknowledges that some industrial areas generate enough ambient heat that emitted plumes are better characterized using an urban dispersion treatment to simulate nighttime heat island effects. The OA smelter facility will utilize approximately 1200 MW electrical usage. Approximately 240 MW (20%) of this usage is released as residual heat. This creates a significant difference in temperature between air just over the smelter facility and the temperature of air just beyond the smelter operations. The Al Taweelah EGA operating smelter in Abu Dabi Emirates has a measured average temperature of about 17.5 degrees difference between potline roof vents release temperature and ambient temperature, as shown in Figure 7-2. Figure 7-3 depicts a satellite infrared imagery of surface temperature observations of EGA Al Taweelah smelter and it also confirms a significant difference in temperature of about 19.5 degrees. Using the residual heat loss value related to about 240 MW, and the subsequent urban/rural temperature difference, a representative population of 2,000,000 is proposed to be used in AERMOD to simulate the strength of the local heat island effect. The same population was approved by EPA for Alcoa Warrick, Indiana and Alcoa Intalco, Washington.

FIGURE 7-2: MEASURED TEMPERATURE AT EGA AL TAWEELAH FACILITY

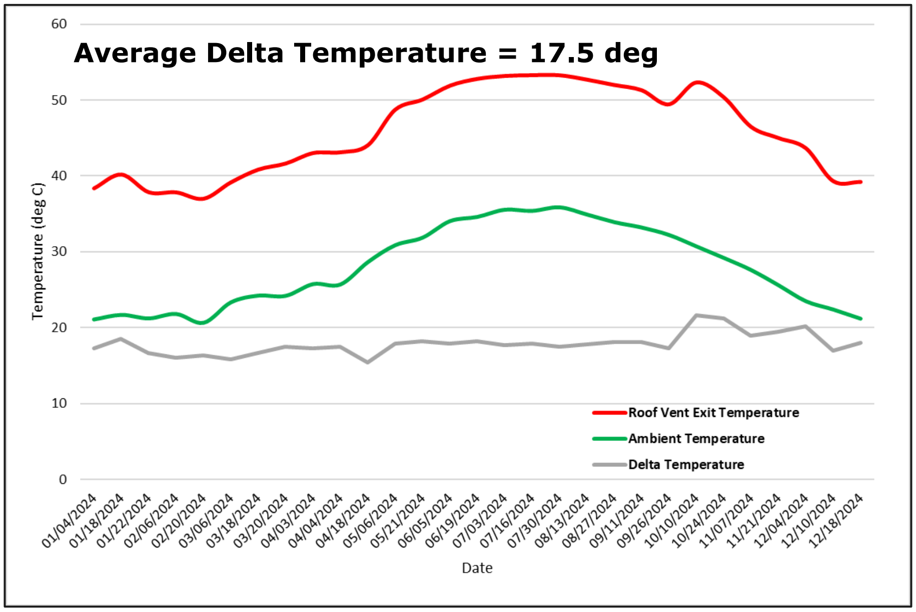
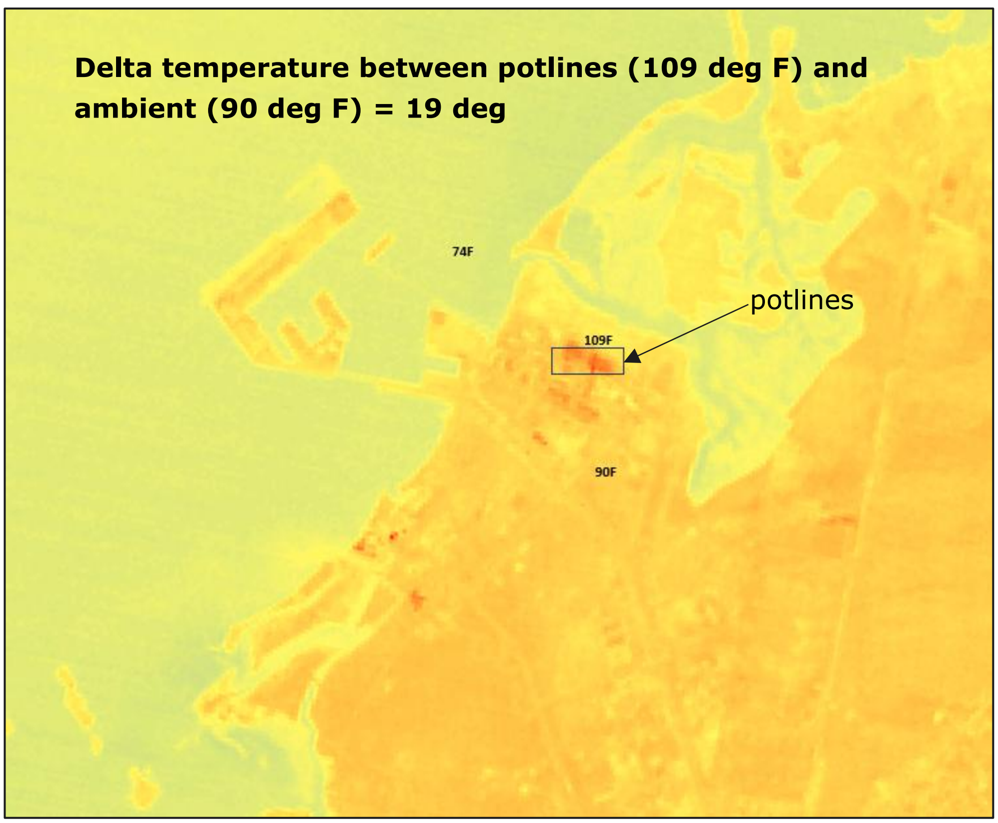


FIGURE 7-3: SATELLITE SURFACE TEMERATURE OVER THE EGA AL TAWEELAH FACILITY



8. RECEPTOR GRID

A comprehensive Cartesian receptor grid extending out to approximately 50 km from the Project will be used in the AERMOD modeling analysis to assess maximum ground-level pollutant concentrations.

The Cartesian receptor grid was developed in accordance with OKDEQ and USEPA Modeling Guidance, and consists of the following receptor spacing:

- Tier 1: 100-meter spacing along the facility boundary and extending out 1 km from the boundary;
- Tier 2: 250-meter spacing extending out 3 km from center of the facility;
- Tier 3: 500-meter spacing extending out 5 km from center of the facility;
- Tier 4: 750-meter spacing extending out 7.5 km from center of the facility;
- Tier 5: 1,000-meter spacing extending out 50 km from the facility boundary;
- Project approximate origin: 270093.40 E (m), 4000683.20 N (m);
- Coordinate system: UTM, Zone 15, NAD-83.

This receptor grid was designed to capture the maximum off-property ground-level concentrations for all pollutants.

Terrain elevations from National Elevation Data of resolution 1/3 arc-second, provided by United States Geological Survey, will be processed using the most recent version of AERMAP (version 24142) to extract the receptor terrain elevations required by AERMOD. Figure 8-1 shows the resulting near-field grid starting at the boundary, and Figure 8-2 shows the resulting far-field grid.

8.1.1 RESTRICTED ACCESS

In accordance with the USEPA draft guidance Revised Policy on Exclusions from "Ambient Air", video surveillance, monitoring, routine security patrols and clear signage may adequately preclude public access.[15] The final modeling report will specify areas that will be excluded from ambient air and the methods used for ensuring restricted public access.

[15] USEPA, *Revised Policy on Exclusions from "Ambient Air"* December, 2019. Available at https://www.epa.gov/sites/default/files/2019-12/documents/ambient_air2019.pdf

FIGURE 8-1: PROPOSED NEAR FIELD RECEPTOR GRID

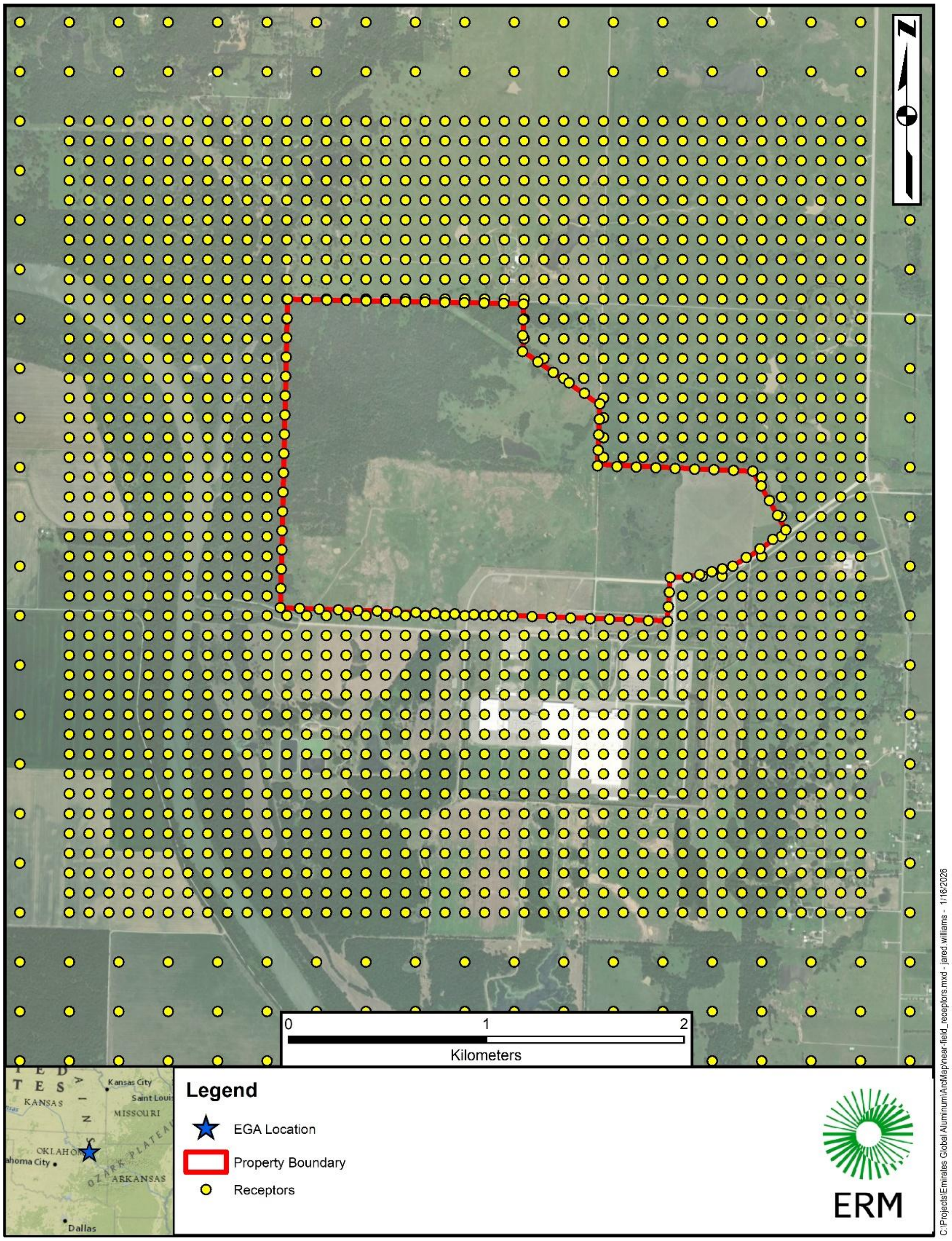
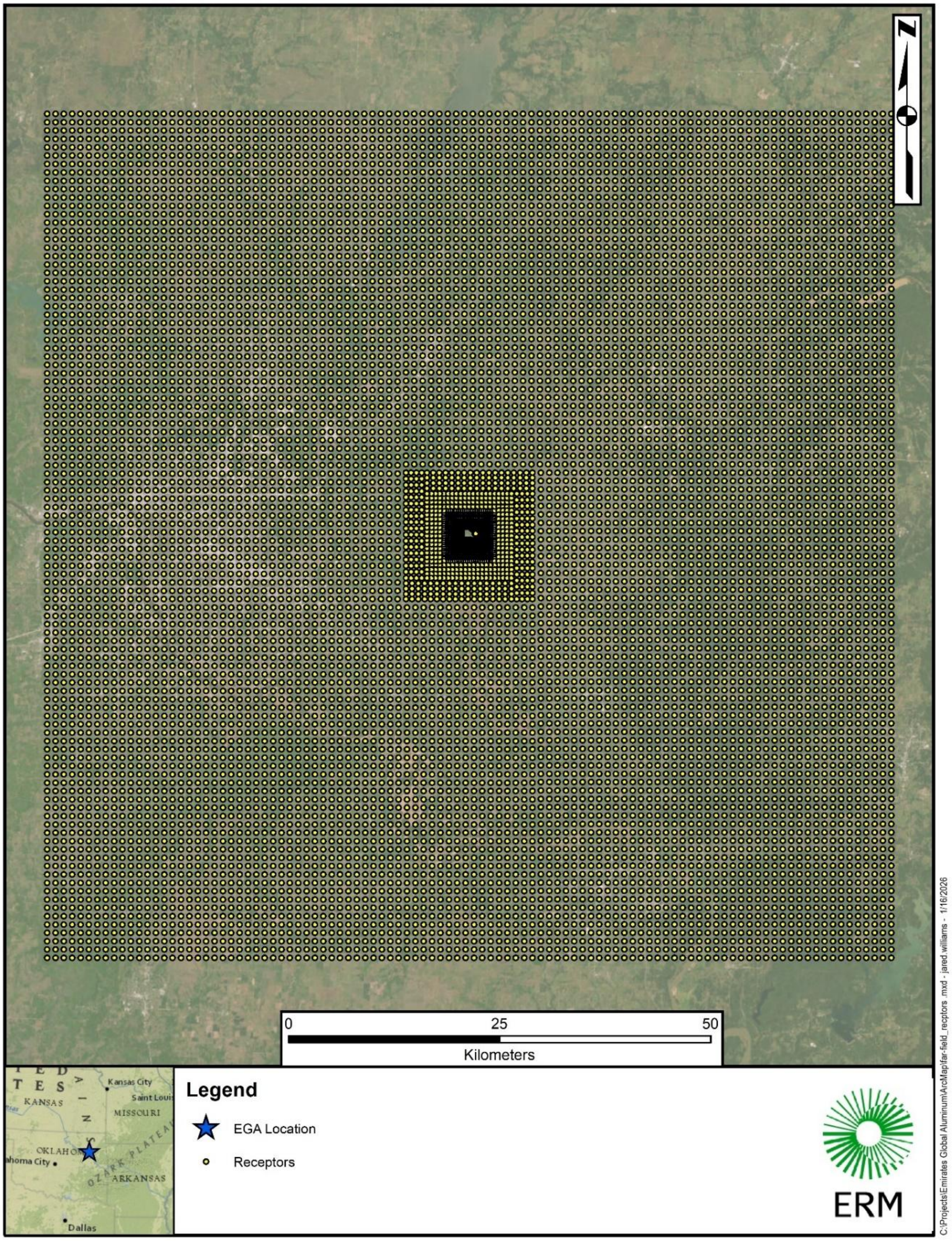


FIGURE 8-2: PROPOSED FAR FIELD RECEPTOR GRID



9. METEOROLOGICAL DATA

AERMOD modeling for the Project will be performed using five consecutive years (2011-2015) of preprocessed meteorology data provided by OKDEQ. These data incorporate surface measurements from the Oklahoma Mesonet Inola Station and the Claremore Regional Airport (KGCM, WBAN No. 53940). Concurrent upper air data from the Norman OK radiosonde launch site (WBAN No. 03948) were also provided by OKDEQ. These meteorological data were processed with version 24142 of AERMET and the ADJ_U* option was applied.

The characteristics of the meteorology data are shown in Table 9-1. Figure 9-1 shows the relative location of the surface data locations and the Project Site, and Figure 9-2 shows the 5-year wind rose for these meteorology data.

TABLE 9-1: CHARACTERISTICS OF THE METEOROLOGICAL DATA

Distance from the Project	12.5 miles (KGCM) | 6 miles (Mesonet)
Average Wind Speed	3.82 meters per second
Percent Calm Hours	0.81%
Data Completeness	99.93%

FIGURE 9-1: METEOROLOGY DATA RELATIVE TO OKLAHOMA ALUMINUM

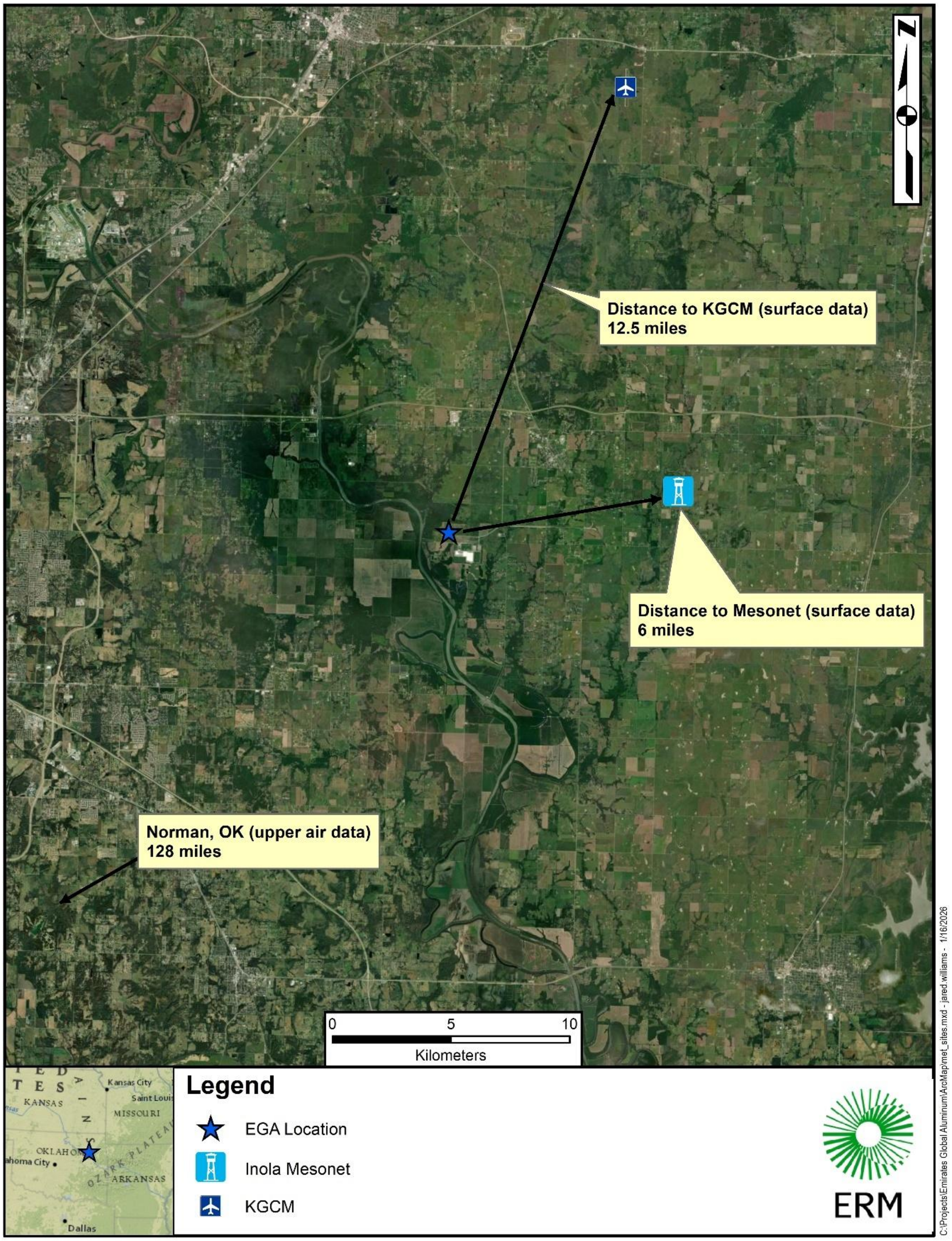
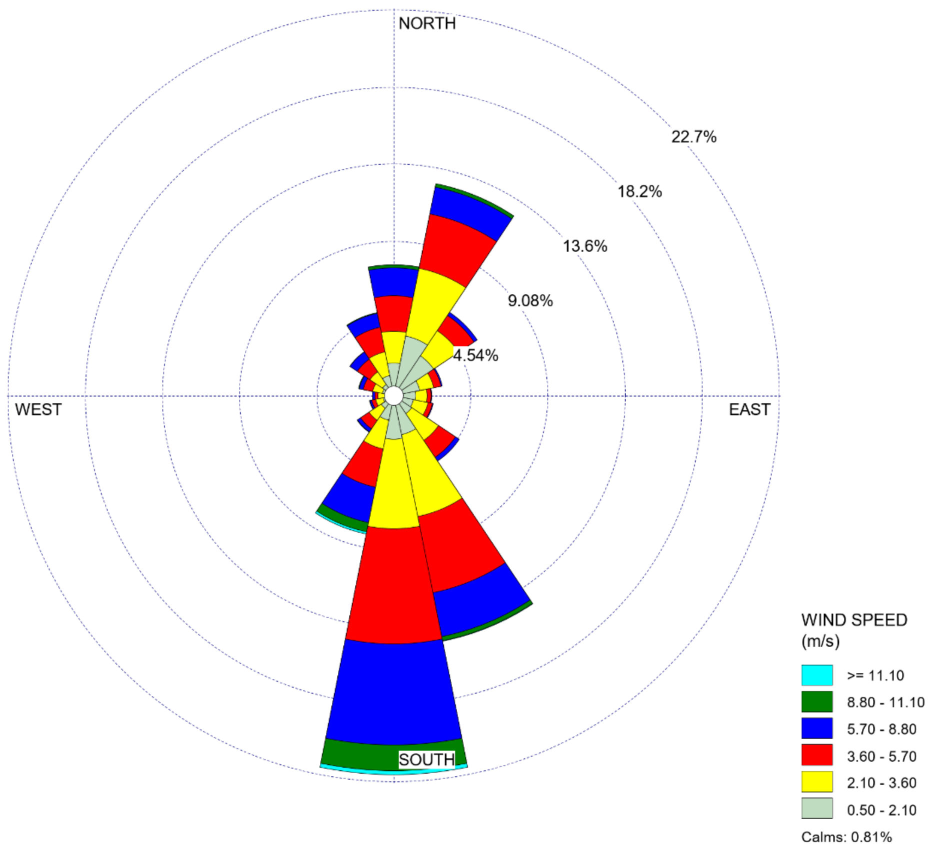


FIGURE 9-2: WINDROSE FOR SURFACE METEOROLOGY DATA

WIND ROSE PLOT:
Inola Mesonet and KGCM Five Year Windrose 2011-2015

DISPLAY:
Wind Speed Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 1/1/2011 - 00:00** **End Date: 12/31/2015 - 23:59**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.81%**	TOTAL COUNT: **43794 hrs.**	
	AVG. WIND SPEED: **3.82 m/s**	DATE: **12/15/2025**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

10. OTHER AIR QUALITY ANALYSES

Per the requirements of 40 CFR Part 52.21(o), OA will evaluate the potential impairment to visibility, soils and vegetation that could occur as a result of the proposed sources. OA will also provide an analysis of the potential air quality impacts predicted for the area from general commercial, residential, industrial and other growth associated with the source or modification. Analyses will be conducted as described in the 1990 Draft USEPA NSR Workshop Manual Guidance[16].

10.1 VISIBILITY IMPAIRMENT ANALYSIS

Section 4.4.1 of the OKDEQ modeling guidelines[2] highlights sensitive areas in Oklahoma that must be included in a visibility analysis using VISCREEN if they are within 30km of the Project. These locations are shown in Table 10-1. The closest sensitive location for a plume visibility analysis is the Deep Fork Wildlife Refuge about 70km away. Since this is well outside of the Class II modeling domain and 30km threshold outlined in the DEQ guidelines, no VISCREEN analysis will be necessary for this modeling demonstration.

TABLE 10-1: SUMMARY OF CLASS II SENSITIVE AREAS FOR VISIBILITY IMPACTS

Sensitive Area	Approximate Distance to Project (km)
Deep Fork Wildlife Refuge	70
Tall Grass Prairie Preserve	110
Ouachita National Forest	170
McCurtain County Wildlife Refuge	215
Arbuckle’s Lake Recreational Area	225
Tishomingo Wildlife Refuge	230
Great Salt Plains State Park	240
Little River Wildlife Refuge	250
Black Kettle National Grassland	380
Lake Optima Wildlife Refuge	500
Rita Blanca National Grassland	610

[16] USEPA. Draft EPA NSR Workshop Manual: PSD and Nonattainment Area Permitting Manual, October 1990. epa.gov/sites/default/files/2015-07/documents/1990wman.pdf

10.2 VEGETATION AND SOIL IMPACT ANALYSIS

PSD regulations require an analysis of air quality impacts on sensitive vegetation types with significant commercial or recreational values, and on sensitive types of soil. Evaluation of potential impacts on sensitive vegetation will be performed by comparing impacts from modeled Project sources to screening concentrations provided by the USEPA document "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals"[17] and to secondary NAAQS. The screening levels represent the minimum concentrations in either plant tissue or soils at which adverse growth effects or tissue injury were reported in the literature. The secondary NAAQS were set by EPA to protect public welfare, including protection against damage to crops and vegetation. Therefore, comparing the Project impacts to the screening levels and the secondary NAAQS demonstrates the emissions from the Project will not negatively impact growth, soils, vegetation, or visibility. Table 10-2 summarizes the applicable screening levels and secondary NAAQS, which maximum modeled impacts will be compared against.

TABLE 10-2: SUMMARY OF SECONDARY NAAQS AND SCREENING LEVELS (µg/m3)

Pollutant	Averaging Periods	Screening Levels	Secondary NAAQS
Ozone	8-hour	-	137
PM_{10}	24-hour	-	150
$PM_{2.5}$	24-hour	-	35
	Annual	-	15
NO_2	4-hour	3,760	-

10.3 ASSOCIATED GROWTH ANALYSIS

Pursuant to federal PSD review regulatory requirements [40 CFR §52.21(o)], the applicant is required to provide an analysis of general commercial, residential, industrial, and other growth associated with the source or modification. The growth analysis will quantify the number of employees, the availability of housing in the area, associated commercial and industrial growth, and construction-related activities and mobile sources. Construction at the facility is expected to require a large temporary workforce. Generally, an in-depth growth analysis is required only if a project would result in a significant shift of population (i.e. thousands of people) and the associated activities into the area, which is not expected.

10.4 CLASS I ANALYSIS

USEPA and OKDEQ require all major source or major modifications which are located within 300 km of a Class I area to perform an impact analysis for the affected Class I areas. There are

[17] USEPA. A Screening Procedure for the Impacts of Air Pollution sources on Plants, Soils, and Animals, EPA 450/2-81-078, December 12, 1980.

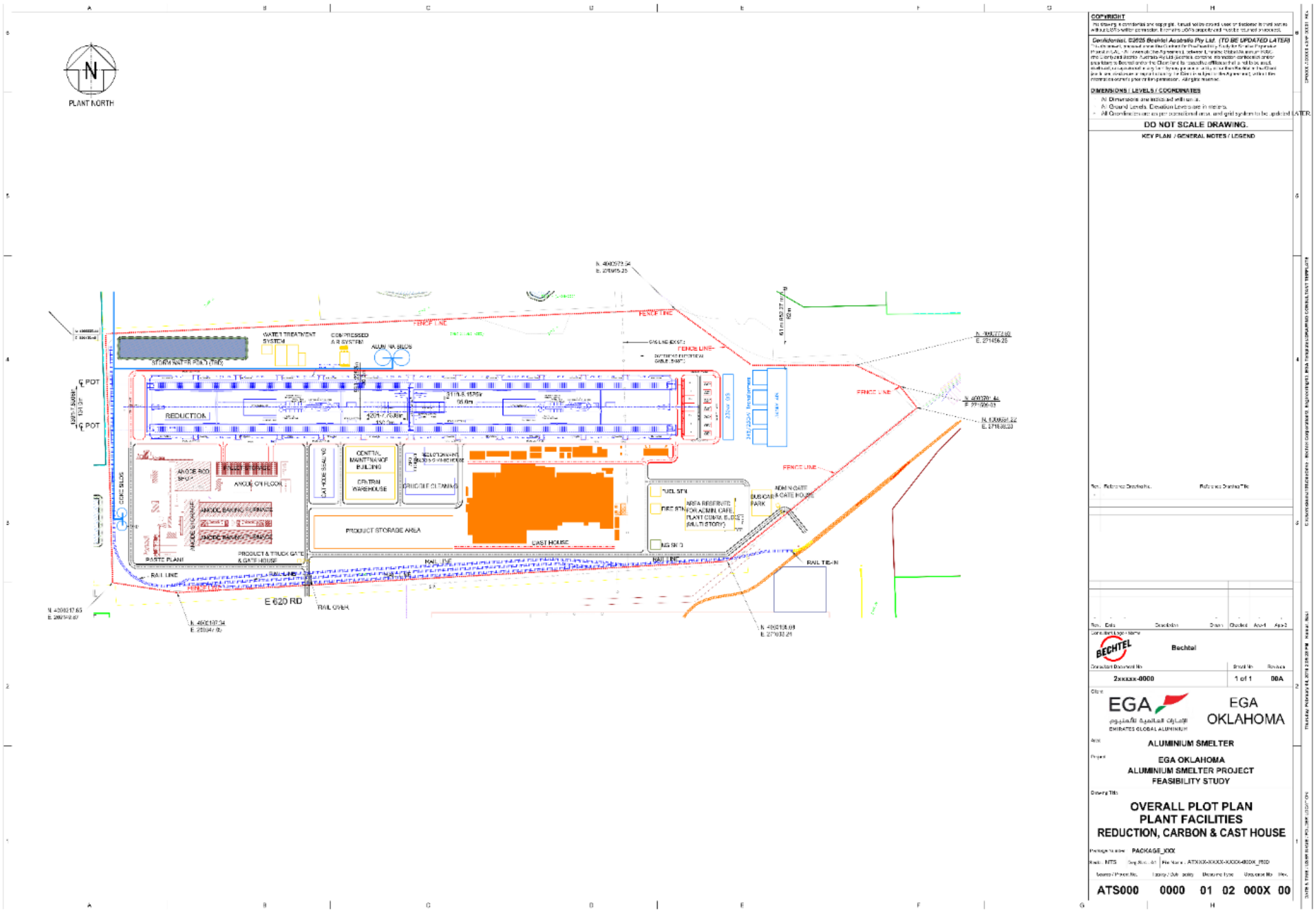
three Class I wilderness areas located generally east of the proposed Project site. These Class I areas are:

- Upper Buffalo Wilderness - 189km to the east in Arkansas,
- Caney Creek Wilderness - 227km to the southeast in Arkansas,
- Hercules-Glades Wilderness - 238km to the east-northeast in Missouri.

OA has engaged with EPA Region 6 regarding the PSD Class I increment modeling and with the Federal Land Managers (FLMs) regarding the air quality-related values (AQRVs) analyses. A separate document will be prepared to address Class I analyses.

APPENDIX A PLOT PLAN

FIGURE A-1: FACILITY PLOT PLAN



APPENDIX B PROJECT EMISSIONS AND STACK PARAMETERS

TABLE B-1: POINT SOURCE PARAMETERS

Source ID	Source Description	Type	UTMx (m) Zone 15 NAD 83	UTMy (m) Zone 15 NAD 83	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Exit Velocity (m/s)	Stack Diameter (m)
210_1	Paste Plant Coke handling and storage operation	POINT	269669.49	4000371.00	185.00	52	Ambient	15.00	0.33
210_2	Paste Plant dry matter crushing & screening operation	POINT	269666.91	4000397.71	185.00	52	Ambient	15.00	0.71
210_3	Paste Plant proportioning and pre-heating operation	POINT	269667.56	4000408.69	185.00	52	Ambient	15.00	0.58
210_4	Paste Plant#1 vertical mill	POINT	269677.90	4000414.08	185.00	52	Ambient	15.00	1.18
210_5	Paste Plant#2 vertical mill	POINT	269657.94	4000415.28	185.00	52	Ambient	15.00	1.18
210_6	Paste plant#1 CTP storage, paste mixing & forming operation	POINT	269678.56	4000425.06	185.00	52	623.15	15.00	1.24
210_7	Paste plant#2 CTP storage, paste mixing & forming operation	POINT	269658.60	4000426.26	185.00	52	623.15	15.00	1.24
210_8	Paste plant HTM gas boiler operation	POINT	269721.87	4000425.97	185.00	15	1773.15	15.00	1.00
220_1	Anode cleaning & slot cutting#1 operation	POINT	269627.10	4000499.76	185.00	5	328.15	15.00	1.00
220_2	Anode cleaning & slot cutting#2 operation	POINT	269633.79	4000611.56	185.00	5	328.15	15.00	1.00
230_1	Baking fires and FTC operation ABF#1	POINT	269986.53	4000580.10	185.00	57	363.15	22.00	2.00
230_2	Baking fires and FTC operation ABF#2	POINT	269985.22	4000558.14	185.00	57	363.15	22.00	2.00
240_1	Butt cleaning operation	POINT	269491.32	4000446.31	185.00	15	Ambient	15.00	0.95
240_2	Butt pre-cleaning operation	POINT	269539.24	4000443.45	185.00	15	Ambient	15.00	0.95
240_3	Butt shot blasting operation	POINT	269603.90	4000422.06	185.00	15	Ambient	15.00	0.95
240_4	Butt & thimble press operation	POINT	269537.62	4000357.19	185.00	15	Ambient	15.00	0.80

Source ID	Source Description	Type	UTMx (m) Zone 15 NAD 83	UTMy (m) Zone 15 NAD 83	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Exit Velocity (m/s)	Stack Diameter (m)
240_5	Butt transfer car operation	POINT	269476.73	4000360.83	185.00	15	Ambient	15.00	0.95
240_6	Cast iron recycling operation	POINT	269428.82	4000363.70	185.00	15	Ambient	15.00	0.80
240_7	Cast iron melting Induction furnace operation	POINT	269573.80	4000426.15	185.00	15	Ambient	15.00	0.80
240_8	Stem brushing operation	POINT	269435.63	4000427.41	185.00	15	Ambient	15.00	0.28
240_9	Stub shot blasting operation	POINT	269411.22	4000387.79	185.00	15	Ambient	15.00	0.95
250_1	Bath handling & storage	POINT	269289.39	4000343.99	185.00	15	Ambient	15.00	0.95
250_2	Bath processing facility operation	POINT	269350.28	4000340.35	185.00	15	Ambient	15.00	1.41
250_3	Cavity bath handling	POINT	269620.03	4000347.91	185.00	15	Ambient	15.00	0.95
260_1	Butts crushing operation	POINT	269579.82	4000362.34	185.00	15	Ambient	15.00	0.63
260_2	Carbon recycled material storage	POINT	269640.66	4000374.73	185.00	52	Ambient	15.00	0.23
322_1	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	POINT	270264.50	4000782.37	182.14	65	310.93	15.81	8.50
322_2	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	POINT	269923.03	4000789.45	182.14	65	310.93	15.81	8.50
324_1	Fluorinated alumina handling & storage#1	POINT	270439.62	4000758.67	185.00	52	Ambient	15.00	0.23
324_2	Fluorinated alumina handling & storage#2	POINT	269763.51	4000777.63	185.00	52	Ambient	15.00	0.23
325_1	Crushed bath handling & storage#1	POINT	270440.57	4000774.64	185.00	52	Ambient	15.00	0.23
325_2	Crushed bath handling & storage#2	POINT	269764.47	4000793.61	185.00	52	Ambient	15.00	0.23
328_1	Fresh alumina handling & storage#1	POINT	270429.11	4000767.31	185.00	52	Ambient	15.00	0.23
328_2	Fresh alumina handling & storage#2	POINT	269774.97	4000784.96	185.00	52	Ambient	15.00	0.23

Source ID	Source Description	Type	UTMx (m) Zone 15 NAD 83	UTMy (m) Zone 15 NAD 83	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Exit Velocity (m/s)	Stack Diameter (m)
341_1	Cast iron melting Induction furnace operation	POINT	270055.28	4000657.48	185.00	15	623.15	15.00	0.57
342_1	Potshell repair blasting operation	POINT	269983.86	4000725.38	185.00	15	Ambient	15.00	1.09
342_2	Pot delining operation	POINT	269963.89	4000726.58	185.00	15	Ambient	15.00	2.58
344_1	Crucible repair station operation	POINT	270202.09	4000599.61	185.00	15	Ambient	15.00	0.69
344_2	Crucible cleaning machine operation	POINT	270200.60	4000574.65	185.00	15	Ambient	15.00	0.69
344_3	Tube cleaning machine operation	POINT	270198.33	4000536.72	185.00	15	Ambient	15.00	0.69
344_4	Crucible lid cleaning operation	POINT	270195.76	4000493.80	185.00	15	Ambient	15.00	0.69
420_1	Casthouse billet casting furnace operation (6 stacks)	POINT	270437.90	4000522.39	185.00	25	1773.15	15.00	4.29
420_2	Casthouse PFA casting furnace operation (2 stacks)	POINT	270309.13	4000530.10	185.00	25	1773.15	15.00	2.47
420_3	Casthouse rod casting furnace operation (2 stacks)	POINT	270289.17	4000531.29	185.00	25	1773.15	15.00	2.47
420_4	Casthouse sheet casting furnace operation (3 stacks)	POINT	270366.03	4000526.69	185.00	25	1773.15	15.00	3.03
460_1	Sodium Reduction Station#1 (2 bays) operation	POINT	270198.10	4000461.75	185.00	15	523.15	15.00	1.04
460_2	Sodium Reduction Station#2 (2 bays) operation	POINT	270195.77	4000422.82	185.00	15	523.15	15.00	1.04
470_1	Casthouse dross press#1 operation	POINT	270311.52	4000570.02	185.00	5	623.15	15.00	0.33
470_2	Casthouse dross press#2 operation	POINT	270368.42	4000566.62	185.00	5	623.15	15.00	0.33
470_3	Casthouse dross press#3 operation	POINT	270440.29	4000562.32	185.00	5	623.15	15.00	0.33
810_1	Alumina storage#1	POINT	269376.90	4000950.19	185.00	65	Ambient	15.00	0.33

Source ID	Source Description	Type	UTMx (m) Zone 15 NAD 83	UTMy (m) Zone 15 NAD 83	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Exit Velocity (m/s)	Stack Diameter (m)
810_2	Alumina storage#2	POINT	269317.01	4000953.77	185.00	65	Ambient	15.00	0.33
820_1	AlF3 handling and storage	POINT	270123.68	4000645.37	185.00	15	Ambient	15.00	0.33
830_1	CPC storage#1	POINT	269279.08	4000956.04	185.00	65	Ambient	15.00	0.33
830_2	CPC storage#2	POINT	269249.13	4000957.83	185.00	65	Ambient	15.00	0.33
900_1	Vacuum barge unloader operation	POINT	268979.00	4001350.79	170.00	10	Ambient	15.00	0.82
900_2	Vacuum barge unloader operation	POINT	269207.96	4001117.84	170.00	10	Ambient	15.00	0.82
900_3	Raw material handling operation	POINT	268975.28	4001245.35	180.00	10	Ambient	15.00	0.33
900_4	Raw material handling operation	POINT	268967.10	4001213.16	180.00	10	Ambient	15.00	0.33

TABLE B-2: POTLINE ROOF VENTS PARAMETERS

Parameter	Parameter Description	Value	Unit
HB	Average building height	13.845	m
L	Average building length	800.00	m
WB	Average building width	28.87	m
WM	Average line source width	TBD	m
Dx	Average building separation	109.385	m
Hs	Release height	TBD	m
F’	Buoyancy release flux	TBD	m4/s3

TABLE B-3: POINT SOURCE EMISSIONS

Source ID	Source Description	SO2 ST (g/s)	SO2 LT (g/s)	PM25 ST (g/s)	PM25 LT (g/s)	PM10 ST (g/s)	PM10 LT (g/s)	NOx ST (g/s)	NOx LT (g/s)	CO (g/s)
210_1	Paste Plant Coke handling and storage operation	0.00E+00	0.00E+00	1.26E-04	7.17E-05	5.04E-04	4.73E-04	0.00E+00	0.00E+00	0.00E+00
210_2	Paste Plant dry matter crushing & screening operation	0.00E+00	0.00E+00	1.26E-04	6.74E-05	5.04E-04	4.45E-04	0.00E+00	0.00E+00	0.00E+00
210_3	Paste Plant proportioning and pre-heating operation	0.00E+00	0.00E+00	4.54E-05	4.59E-05	2.52E-04	3.03E-04	0.00E+00	0.00E+00	0.00E+00
210_4	Paste Plant#1 vertical mill	0.00E+00	0.00E+00	2.14E-03	2.17E-03	1.44E-02	1.44E-02	0.00E+00	0.00E+00	0.00E+00
210_5	Paste Plant#2 vertical mill	0.00E+00	0.00E+00	2.14E-03	2.17E-03	1.44E-02	1.44E-02	0.00E+00	0.00E+00	0.00E+00
210_6	Paste plant#1 CTP storage, paste mixing & forming	1.40E-01	1.40E-01	1.01E-03	9.98E-04	6.55E-03	6.59E-03	8.33E-02	8.32E-02	9.51E-02
210_7	Paste plant#2 CTP storage, paste mixing & forming	1.40E-01	1.40E-01	1.01E-03	9.98E-04	6.55E-03	6.59E-03	8.33E-02	8.32E-02	9.51E-02
210_8	Paste plant HTM gas boiler operation	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-02	1.16E-02	2.02E-03
220_1	Anode cleaning & slot cutting#1 operation	0.00E+00	0.00E+00	5.04E-04	4.75E-04	3.15E-03	3.13E-03	0.00E+00	0.00E+00	0.00E+00
220_2	Anode cleaning & slot cutting#2 operation	0.00E+00	0.00E+00	5.04E-04	4.75E-04	3.15E-03	3.13E-03	0.00E+00	0.00E+00	0.00E+00
230_1	Baking fires and FTC operation ABF#1	1.04E+01	1.04E+01	1.35E-01	1.35E-01	1.36E-01	1.36E-01	3.54E+00	3.54E+00	8.97E+00
230_2	Baking fires and FTC operation ABF#2	1.04E+01	1.04E+01	1.35E-01	1.35E-01	1.36E-01	1.36E-01	3.54E+00	3.54E+00	8.97E+00
240_1	Butt cleaning operation	0.00E+00	0.00E+00	7.56E-04	7.38E-04	4.91E-03	4.87E-03	0.00E+00	0.00E+00	0.00E+00
240_2	Butt pre-cleaning operation	0.00E+00	0.00E+00	7.56E-04	7.38E-04	4.91E-03	4.87E-03	0.00E+00	0.00E+00	0.00E+00
240_3	Butt shot blasting operation	0.00E+00	0.00E+00	5.04E-04	5.53E-04	3.65E-03	3.65E-03	0.00E+00	0.00E+00	0.00E+00
240_4	Butt & thimble press operation	0.00E+00	0.00E+00	1.26E-04	1.30E-04	8.82E-04	8.60E-04	0.00E+00	0.00E+00	0.00E+00
240_5	Butt transfer car operation	0.00E+00	0.00E+00	7.56E-04	7.38E-04	4.91E-03	4.87E-03	0.00E+00	0.00E+00	0.00E+00
240_6	Cast iron recycling operation	0.00E+00	0.00E+00	3.65E-03	3.68E-03	3.65E-03	3.68E-03	0.00E+00	0.00E+00	0.00E+00
240_7	Cast iron melting Induction furnace operation	0.00E+00	0.00E+00	3.40E-03	3.38E-03	3.40E-03	3.38E-03	0.00E+00	0.00E+00	0.00E+00
240_8	Stem brushing operation	0.00E+00	0.00E+00	3.78E-04	3.44E-04	7.56E-04	7.12E-04	0.00E+00	0.00E+00	0.00E+00
240_9	Stub shot blasting operation	0.00E+00	0.00E+00	1.39E-02	1.39E-02	1.39E-02	1.39E-02	0.00E+00	0.00E+00	0.00E+00
250_1	Bath handling & storage	0.00E+00	0.00E+00	7.56E-04	7.38E-04	4.91E-03	4.87E-03	0.00E+00	0.00E+00	0.00E+00
250_2	Bath processing facility operation	0.00E+00	0.00E+00	1.51E-03	1.48E-03	9.70E-03	9.76E-03	0.00E+00	0.00E+00	0.00E+00
250_3	Cavity bath handling	0.00E+00	0.00E+00	7.56E-04	7.38E-04	4.91E-03	4.87E-03	0.00E+00	0.00E+00	0.00E+00

Source ID	Source Description	SO2 ST (g/s)	SO2 LT (g/s)	PM25 ST (g/s)	PM25 LT (g/s)	PM10 ST (g/s)	PM10 LT (g/s)	NOx ST (g/s)	NOx LT (g/s)	CO (g/s)
260_1	Butts crushing operation	0.00E+00	0.00E+00	1.01E-03	1.00E-03	6.68E-03	6.63E-03	0.00E+00	0.00E+00	0.00E+00
260_2	Carbon recycled material storage	0.00E+00	0.00E+00	2.65E-05	2.60E-05	1.71E-04	1.72E-04	0.00E+00	0.00E+00	0.00E+00
322_1	GTC #1 - cell operation rooms A1&B1 & Fluorinated alumina handling	1.75E+01	1.75E+01	6.34E-01	6.34E-01	7.26E-01	7.26E-01	5.67E-01	5.67E-01	1.23E+03
322_2	GTC #2 - cell operation rooms A2&B2 & Fluorinated alumina handling	1.75E+01	1.75E+01	6.34E-01	6.34E-01	7.26E-01	7.26E-01	5.67E-01	5.67E-01	1.23E+03
324_1	Fluorinated alumina handling & storage#1	0.00E+00	0.00E+00	2.52E-04	2.08E-04	6.30E-04	5.90E-04	0.00E+00	0.00E+00	0.00E+00
324_2	Fluorinated alumina handling & storage#2	0.00E+00	0.00E+00	2.52E-04	2.08E-04	6.30E-04	5.90E-04	0.00E+00	0.00E+00	0.00E+00
325_1	Crushed bath handling & storage#1	0.00E+00	0.00E+00	3.65E-05	3.68E-05	2.52E-04	2.43E-04	0.00E+00	0.00E+00	0.00E+00
325_2	Crushed bath handling & storage#2	0.00E+00	0.00E+00	3.65E-05	3.68E-05	2.52E-04	2.43E-04	0.00E+00	0.00E+00	0.00E+00
328_1	Fresh alumina handling & storage#1	0.00E+00	0.00E+00	2.52E-04	2.08E-04	6.30E-04	5.90E-04	0.00E+00	0.00E+00	0.00E+00
328_2	Fresh alumina handling & storage#2	0.00E+00	0.00E+00	2.52E-04	2.08E-04	6.30E-04	5.90E-04	0.00E+00	0.00E+00	0.00E+00
341_1	Cast iron melting Induction furnace operation	0.00E+00	0.00E+00	6.30E-04	6.10E-04	6.30E-04	6.10E-04	0.00E+00	0.00E+00	0.00E+00
342_1	Potshell repair blasting operation	0.00E+00	0.00E+00	1.26E-03	1.26E-03	1.26E-03	1.26E-03	0.00E+00	0.00E+00	0.00E+00
342_2	Pot delining operation	0.00E+00	0.00E+00	1.26E-04	7.39E-05	5.04E-04	4.88E-04	0.00E+00	0.00E+00	0.00E+00
344_1	Crucible repair station operation	0.00E+00	0.00E+00	2.52E-04	2.20E-04	1.51E-03	1.45E-03	0.00E+00	0.00E+00	0.00E+00
344_2	Crucible cleaning machine operation	0.00E+00	0.00E+00	2.52E-04	2.20E-04	1.51E-03	1.45E-03	0.00E+00	0.00E+00	0.00E+00
344_3	Tube cleaning machine operation	0.00E+00	0.00E+00	2.52E-04	2.20E-04	1.51E-03	1.45E-03	0.00E+00	0.00E+00	0.00E+00
344_4	Crucible lid cleaning operation	0.00E+00	0.00E+00	2.52E-04	2.20E-04	1.51E-03	1.45E-03	0.00E+00	0.00E+00	0.00E+00
420_1	Casthouse billet casting furnace operation (6 stacks)	1.59E-02	1.58E-02	1.13E-02	1.14E-02	2.36E-02	2.36E-02	2.27E-01	2.27E-01	2.08E-01
420_2	Casthouse PFA casting furnace operation (2 stacks)	6.80E-03	6.78E-03	4.91E-03	4.88E-03	1.01E-02	1.01E-02	9.73E-02	9.73E-02	8.92E-02
420_3	Casthouse rod casting furnace operation (2 stacks)	3.78E-03	3.77E-03	2.77E-03	2.71E-03	5.67E-03	5.62E-03	5.41E-02	5.41E-02	4.95E-02
420_4	Casthouse sheet casting furnace operation (3 stacks)	6.80E-03	6.78E-03	4.91E-03	4.88E-03	1.01E-02	1.01E-02	9.73E-02	9.73E-02	8.92E-02
460_1	Sodium Reduction Station#1 (2 bays) operation	0.00E+00	0.00E+00	1.26E-04	1.87E-04	3.78E-04	3.87E-04	0.00E+00	0.00E+00	0.00E+00
460_2	Sodium Reduction Station#2 (2 bays) operation	0.00E+00	0.00E+00	1.26E-04	1.87E-04	3.78E-04	3.87E-04	0.00E+00	0.00E+00	0.00E+00
470_1	Casthouse dross press#1 operation	0.00E+00	0.00E+00	1.26E-04	1.56E-04	3.78E-04	3.22E-04	0.00E+00	0.00E+00	0.00E+00
470_2	Casthouse dross press#2 operation	0.00E+00	0.00E+00	1.26E-04	1.56E-04	3.78E-04	3.22E-04	0.00E+00	0.00E+00	0.00E+00

Source ID	Source Description	SO2 ST (g/s)	SO2 LT (g/s)	PM25 ST (g/s)	PM25 LT (g/s)	PM10 ST (g/s)	PM10 LT (g/s)	NOx ST (g/s)	NOx LT (g/s)	CO (g/s)
470_3	Casthouse dross press#3 operation	0.00E+00	0.00E+00	1.26E-04	1.56E-04	3.78E-04	3.22E-04	0.00E+00	0.00E+00	0.00E+00
810_1	Alumina storage#1	0.00E+00	0.00E+00	2.52E-05	2.85E-05	7.56E-05	8.09E-05	0.00E+00	0.00E+00	0.00E+00
810_2	Alumina storage#2	0.00E+00	0.00E+00	2.52E-05	2.85E-05	7.56E-05	8.09E-05	0.00E+00	0.00E+00	0.00E+00
820_1	AlF3 handling and storage	0.00E+00	0.00E+00	3.02E-05	3.03E-05	8.57E-05	8.59E-05	0.00E+00	0.00E+00	0.00E+00
830_1	CPC storage#1	0.00E+00	0.00E+00	1.26E-06	1.45E-06	1.01E-05	9.55E-06	0.00E+00	0.00E+00	0.00E+00
830_2	CPC storage#2	0.00E+00	0.00E+00	1.26E-06	1.45E-06	1.01E-05	9.55E-06	0.00E+00	0.00E+00	0.00E+00
900_1	Vacuum barge unloader operation	0.00E+00	0.00E+00	2.52E-03	2.50E-03	7.06E-03	7.08E-03	0.00E+00	0.00E+00	0.00E+00
900_2	Vacuum barge unloader operation	0.00E+00	0.00E+00	1.26E-04	1.27E-04	8.82E-04	8.36E-04	0.00E+00	0.00E+00	0.00E+00
900_3	Raw material handling operation	0.00E+00	0.00E+00	1.26E-04	1.14E-04	3.28E-04	3.24E-04	0.00E+00	0.00E+00	0.00E+00
900_4	Raw material handling operation	0.00E+00	0.00E+00	6.30E-06	5.79E-06	3.78E-05	3.82E-05	0.00E+00	0.00E+00	0.00E+00

TABLE B-4: POTLINE ROOF VENT EMISSIONS

Source ID	Source Description	SO2 ST (g/s)	SO2 LT (g/s)	PM25 ST (g/s)	PM25 LT (g/s)	PM10 ST (g/s)	PM10 LT (g/s)	NOx ST (g/s)	NOx LT (g/s)	CO (g/s)
POT1_N	Cell operation room A1, Cell operation room A2, Anode cover material transportation PTM station room A1-1, Anode cover material transportation PTM station room A1-2, Anode cover material transportation PTM station room A2-1, Anode cover material transportation PTM station room A2-2	2.09E+00	2.09E+00	1.90E+00	1.90E+00	3.46E+00	3.46E+00	6.55E-03	6.48E-03	1.41E+01
POT1_S	Cell operation room B1, Cell operation room B2, Anode cover material transportation PTM station room B1-1, Anode cover material transportation PTM station room B1-2, Anode cover material transportation PTM station room B2-1, Anode cover material transportation PTM station room B2-2	2.09E+00	2.09E+00	1.90E+00	1.90E+00	3.46E+00	3.46E+00	6.55E-03	6.48E-03	1.41E+01

TABLE B-5: HAUL ROAD SEGMENTS AND EMISSIONS

Segment ID	Approximate Segment Length (m)	PM10 (g/s)	PM25 (g/s)
1-1	68.8	1.67E-03	4.09E-04
1-2	656.5	6.17E-02	1.51E-02
1-3	147.9	1.35E-02	3.32E-03
1-4	275.5	1.60E-02	3.93E-03
1-5	255.8	1.43E-02	3.52E-03
1-6	296.4	1.61E-02	3.96E-03
1-7	111.2	5.44E-03	1.33E-03
2	209.6	5.81E-03	1.43E-03
3	204.5	1.92E-02	4.70E-03
4-1	67.7	1.70E-03	4.17E-04
4-2	150.9	1.35E-02	3.32E-03
4-3	129.5	1.18E-02	2.89E-03
4-4	266.9	2.51E-02	6.15E-03
4-5	323.6	2.89E-02	7.09E-03
4-6	229.5	1.21E-02	2.97E-03
4-7	525.7	2.86E-02	7.01E-03
4-8	58.4	1.58E-03	3.87E-04
4-9	59.8	1.58E-03	3.87E-04
5-1	70.5	1.79E-03	4.39E-04
5-2	72.4	1.79E-03	4.39E-04
5-3	79.9	2.24E-03	5.49E-04
5-4	31.1	1.13E-03	2.77E-04
5-5	121.2	4.52E-03	1.11E-03
6-1	349.9	8.68E-03	2.13E-03
6-2	266.4	6.70E-03	1.65E-03
6-3	172.7	4.85E-03	1.19E-03
7-1	68.5	2.85E-03	6.99E-04
7-2	73.6	3.56E-03	8.74E-04
7-3	78.2	3.56E-03	8.74E-04
7-4	50.8	1.18E-03	2.90E-04
8	344.9	8.28E-03	2.03E-03
9-1	211.4	1.08E-02	2.65E-03
9-2	61.3	3.32E-03	8.15E-04

Segment ID	Approximate Segment Length (m)	PM10 (g/s)	PM25 (g/s)
9-3	72.4	3.56E-03	8.74E-04
10-1	186.9	4.73E-03	1.16E-03
10-2	35.3	1.18E-03	2.90E-04
11	120.7	3.55E-03	8.71E-04
12-1	78.8	4.41E-03	1.08E-03
12-2	74.1	4.35E-03	1.07E-03
12-3	114.3	6.09E-03	1.49E-03
12-4	138.9	4.96E-03	1.22E-03
12-5	128.8	4.23E-03	1.04E-03
12-6	304.2	8.22E-03	2.02E-03
12-7	106.6	3.03E-03	7.43E-04
12-8	87.0	2.08E-03	5.10E-04
12-9	250.4	6.65E-03	1.63E-03
12-10	418.0	1.08E-02	2.65E-03
13	158.5	4.16E-03	1.02E-03
14	251.0	6.31E-03	1.55E-03
15	167.7	4.16E-03	1.02E-03
16	203.5	5.13E-03	1.26E-03
17	197.7	1.71E-02	4.20E-03
18	197.8	4.73E-03	1.16E-03
19	199.0	4.73E-03	1.16E-03
20-1	195.4	4.73E-03	1.16E-03
20-2	145.0	3.55E-03	8.71E-04
21-1	77.6	1.97E-03	4.84E-04
21-2	145.0	3.55E-03	8.71E-04
21-3	110.8	2.76E-03	6.78E-04
22-1	26.1	2.17E-03	5.32E-04
22-2	136.3	8.67E-03	2.13E-03
22-3	51.8	3.25E-03	7.98E-04
22-4	155.2	9.73E-03	2.39E-03
23-1	147.0	3.55E-03	8.71E-04
23-2	188.4	4.73E-03	1.16E-03
24-1	81.3	5.57E-03	1.37E-03
24-2	42.3	3.34E-03	8.20E-04

Segment ID	Approximate Segment Length (m)	PM10 (g/s)	PM25 (g/s)
25-1	66.4	1.76E-03	4.33E-04
25-2	49.3	1.18E-03	2.90E-04
25-3	96.7	2.37E-03	5.81E-04
26-1	83.4	2.08E-03	5.12E-04
26-2	41.3	1.25E-03	3.06E-04
26-3	68.3	1.64E-03	4.04E-04
26-4	189.7	4.73E-03	1.16E-03
27	112.9	3.55E-03	8.71E-04
28	78.7	2.17E-03	5.32E-04
29	75.2	2.08E-03	5.10E-04
30	119.5	2.88E-03	7.06E-04
31-1	45.7	1.23E-03	3.03E-04
31-2	28.1	8.22E-04	2.02E-04
31-3	23.7	8.22E-04	2.02E-04
31-4	46.2	1.23E-03	3.03E-04
32-1	115.3	2.88E-03	7.06E-04
32-2	69.1	1.64E-03	4.04E-04
33	42.8	1.23E-03	3.03E-04
34-1	76.5	2.06E-03	5.04E-04
34-2	120.1	2.88E-03	7.06E-04
34-3	120.5	2.76E-03	6.78E-04
34-4	66.8	1.58E-03	3.87E-04
35	61.5	1.83E-03	4.49E-04
36	62.3	1.64E-03	4.04E-04
37	71.9	1.64E-03	4.04E-04
38	63.6	1.58E-03	3.87E-04
39	39.8	1.18E-03	2.90E-04
40	31.3	1.02E-03	2.51E-04
41	28.4	1.42E-03	3.50E-04

APPENDIX C OZONE MONITOR JUSTIFICATION

C.1 Ozone Monitor Justification

The following sections provide justification for using the Cherokee Heights Ozone monitor for the Oklahoma Aluminum PSD Modeling Application.

C.1.1 Proximity and Land Use Considerations

The Cherokee Heights Ozone monitor (AQS ID 40-097-9014) is located about 29 km east of the Project in Mayes County. Mayes County is located at a similar elevation to the project site (about 185 meters) and has gentle sloping terrain much like Rogers County. Despite being a Tribal monitor with a neighborhood scale, the monitor meets the data completeness requirements with a valid 2022-2024 design value from the EPA.

Both the Cherokee Heights monitor and the Project, shown in Figure C-1, are in predominately rural settings, with forests interspaced with farmland and waterways. A comparison of NLCD land use categories is shown in Figure C-2; both regions have a similar distribution of land use categories. Therefore, the Cherokee Heights monitor is representative of the Project site.

FIGURE C-1: AERIAL IMAGERY SURROUNDING CHEROKEE HEIGHTS MONITOR

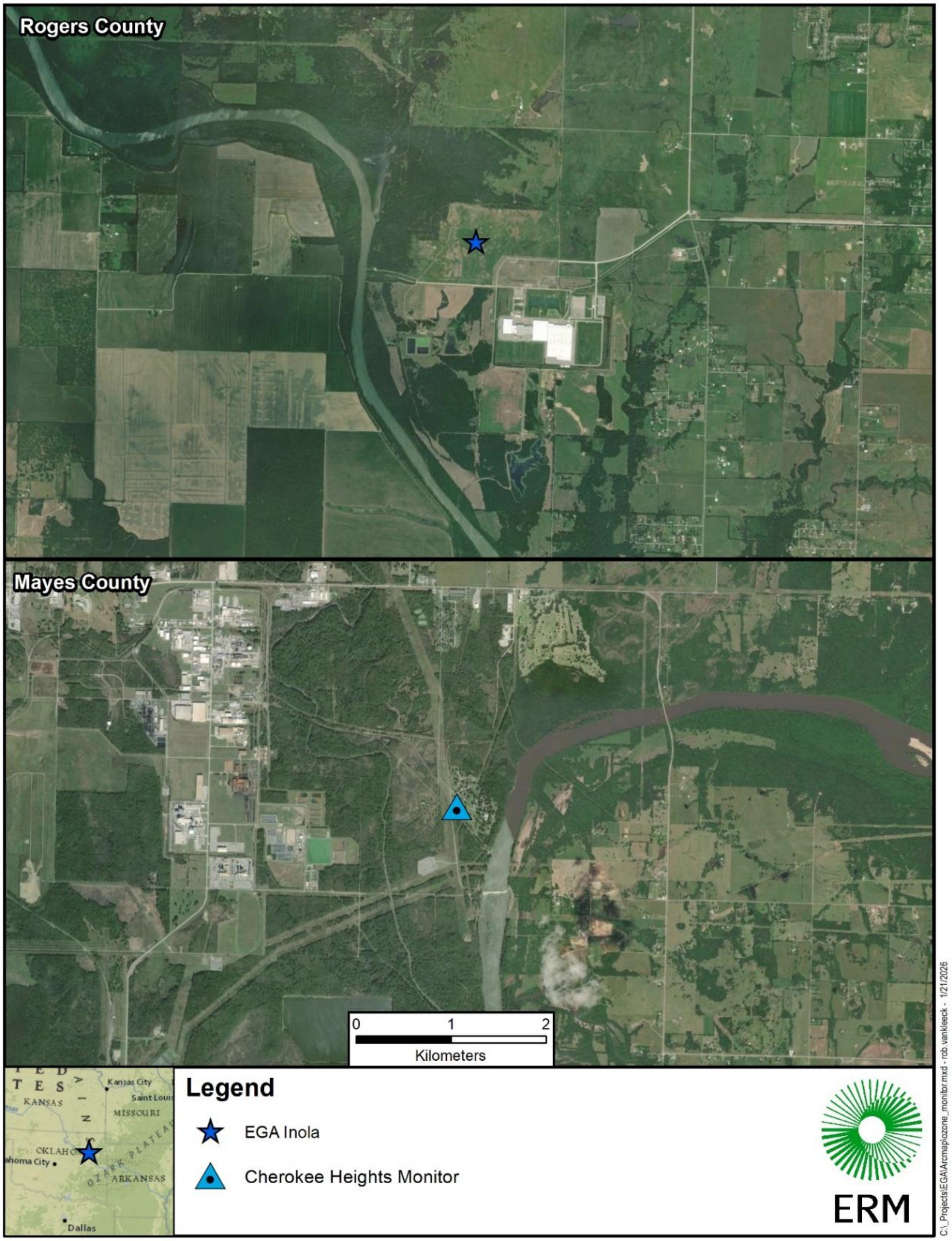
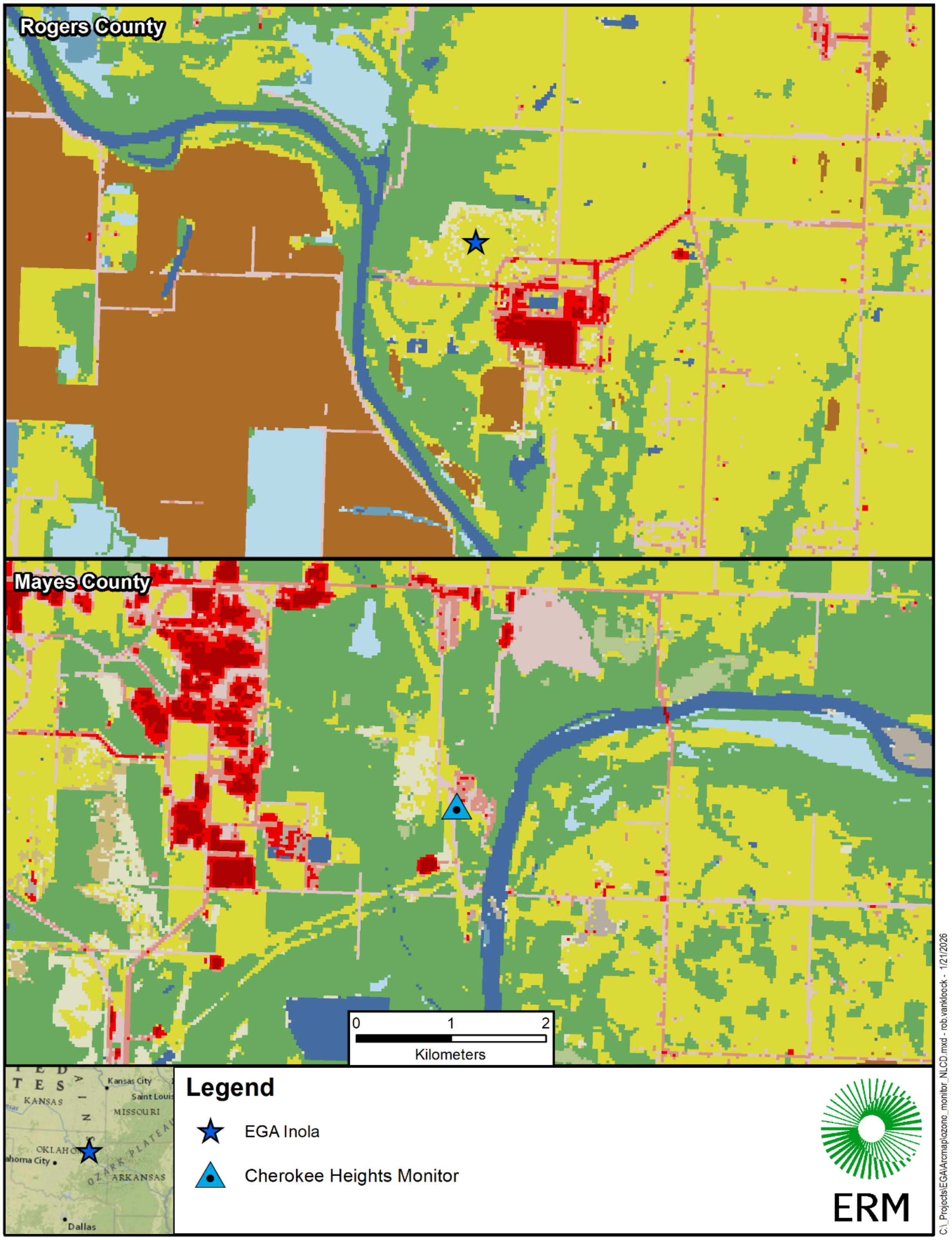


FIGURE C-2: 2024 NLCD LANDUSE SURROUNDING CHEROKEE HEIGHTS MONITOR



ERM

ERM HAS OVER 140 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina

Australia

Belgium

Brazil

Canada

China

Colombia

Denmark

France

Germany

Hong Kong

India

Indonesia

Ireland

Italy

Japan

Kazakhstan

Kenya

Malaysia

Mexico

Mozambique

Netherlands

New Zealand

Panama

Peru

Poland

Portugal

Romania

Singapore

South Africa

South Korea

Spain

Switzerland

Taiwan

Thailand

UAE

UK

US

Vietnam

ERM's Hartford Office

95 Glastonbury Boulevard
Suite 101
Glastonbury, CT 06033

T +1 860 466 8500
F +1 860 466 8501

www.erm.com

From:	Andrew Rengel
To:	DEQ AQD APU; Phillip Fielder
Cc:	Ziad Fares; Sudip Kumar Ghosh; NOOR SHAHAB ABDULRAZAQ FIKREE FIKREE; Gary Keating; Jeff Twaddle; Olga Samani; Rob Van Kleeck; Margaret Averill
Subject:	[EXTERNAL] PSD Construction Permit Application - Emirates Global Aluminum
Date:	Monday, February 9, 2026 2:13:47 PM
Attachments:	image001.png 20260209_OklahomaAluminum_PSDApplication.pdf

Dear Mr. Fielder,

On behalf of Emirates Global Aluminum (EGA), Environmental Resources Management (ERM) is pleased to submit this Prevention of Significant Deterioration (PSD) Air Permit Application for the planned Aluminum Smelter to be located on E 620 Road, Inola, OK 74036 at the Tulsa Ports Industrial Park in Inola, OK (Rogers County). Consistent with our discussions, the PSD Air Permit Application is being submitted electronically via the email address provided on the Oklahoma Environmental Quality website (AQD_APU@deq.ok.gov).

EGA has elected to pursue the Expedited Air Quality Permit Pilot Program in recognition of the critical schedule requirements tied to their planned aluminum smelter construction. A cover letter and payment associated with the air permit application processing fee ($7,500), and the expedited permit program fee ($15,000) and contract is being provided via express mail.

The application includes the following components:

- Introductory information that summarizes the process and air emissions, air regulatory program requirements; and
- Appendices which include application forms, air emission calculations, a process flow diagram, a Best Available Control Technology (BACT) Assessment, and an Air Emission Dispersion Modeling Protocol for the surrounding Class 2 Area.

EGA is committed to developing a facility design that fully meets the applicable air pollution regulatory requirements. The proposed EGA facility will be subject to, and will comply with, stringent air pollution regulatory requirements including PSD BACT, and the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Primary and Secondary Aluminum Smelting Operations (also known as Maximum Achievable Control Technology (MACT) Standards).

As discussed, the information presented in the application is accurate and complete as of the date of submittal but will be refined as project design and engineering activities progress. EGA will provide updates to the application as needed to support the PSD permitting process. This will include an update to the business entity’s official legal name, which is still being finalized. The entity is currently referred to in the application as EGA, and Oklahoma Aluminum, neither of which will be the final name.

Thank you in advance for your review and processing of the application. We look forward to on-going collaboration as the permitting process progresses.

Regards,

Andrew Rengel

ERM
Sustainability is our business

Managing Technical Consultant, Sustainable Operations
He/Him/His

Rolling Meadows
+1 847 258 8990

erm.com