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June 26, 2024

Melinda Wolanin
North Carolina Department of Environmental Quality
Division of Air Quality
610 East Center Avenue
Suite 301
Mooresville, NC 28115

Re: North Carolina Non-Title V Air Permit Application for Albemarle U.S., Inc. proposed Kings Mountain Lithium Mine Project in Kings Mountain, North Carolina.

Ms. Wolanin,

In accordance with the minor source permitting requirements of 15A North Carolina Administrative Code (NCAC) 02Q, Albemarle U.S., Inc. (Albemarle) is submitting a Non-Title V air permit application to recommission an existing spodumene ore mine and to construct and operate a new spodumene Concentrator Plant to process the extracted ore at its Kings Mountain facility in Kings Mountain, Cleveland County, NC.

All applicable NCDEQ DAQ forms and an application checklist can be found in Attachment A of this application, including the forms A1, A2-A3, all applicable B and C source forms, D1, D4, and D5.

As required for Non-Title V air permit applications, two copies are being submitted to the NCDEQ Mooresville Regional Office. The small source new permit fee of \$50 will be submitted via the NCDEQ Air Quality Application ePayments website. Please contact Kathryn Gardner, with the application ID needed for permit payment online, at Kathryn.gardner@swca.com.

Please feel free to contact me at (479) 651-6837 with any questions regarding this submittal.

Sincerely,

Seth Gately
Air Quality Project Specialist
SWCA Environmental Consultants

North Carolina Non-Title V Air Permit Application

Kings Mountain Lithium Mine Project

June 26, 2024

Document No.: KM60-EN-RP-9091

Revision: 0



Revision Record

Revision	Date	Description

Approval Record

	Name	Title	Signature	Date
[Insert Consultancy Name] Prepared By:				Month Day, Year
[Insert Consultancy Name] Approved By:				
Albemarle Approved By:				

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1. INTRODUCTION

In accordance with the minor source permitting requirements of 15A North Carolina Administrative Code (NCAC) 02Q, Albemarle U.S., Inc. (Albemarle) is submitting a Non-Title V air permit application to recommission and construct a new spodumene Concentrator to process the extracted spodumene ore at its Kings Mountain facility in Cleveland County, North Carolina.

Spodumene is a lithium aluminum silicate mineral and is found in pegmatite deposits at the mine. The mining operation would separate the spodumene ore from the overburden (i.e., a rocky/soil waste material), with the spodumene ore providing feedstock for the newly constructed Concentrator. The Concentrator would then produce concentrated ore known as “spodumene concentrate” by mechanical separation processes, including flotation.

A brief overview of the Project location and associated maps are presented in Section 2. A process description describing both the process and the associated emission sources is presented in Section 3. A discussion of the methods used to calculate emissions from the process equipment is included in Section 4, and a regulatory analysis discussing the applicability of both federal and state regulations is presented in Section 5.

All required NC DEQ forms for Non-Title V air permit applications are attached as Appendix A along with the air permit application checklist. The B and C forms are grouped by source number. These forms are presented in the order of the process flow and in the order that they appear in the emission calculations. Emissions of PM, PM₁₀, and PM_{2.5} presented in each emission source Form B represent the fugitive emissions from each emission source, i.e., emissions not captured and routed to the control device. All controlled PM, PM₁₀, and PM_{2.5} emissions captured or exhausted into the atmosphere by each baghouse are presented in Form C1.

Emission calculations are provided in Appendix B. Equipment specifications for the DMS Dryer (ES-039d), equipment specifications for the dust collection baghouses (CD-016, CD-018, CD-020, CD-021, CD-022, CD-023, CD-039, CD-040, and CD-043), and Safety Data Sheets (SDSs) for the reagents used in the Concentrator are provided in Appendix C. The specification sheets for the baghouses are marked-up working documents showing the latest designs from the vendor. Final baghouse specification sheets can be provided after equipment selection is confirmed.

As noted in the North Carolina Department of Air Quality (NC DAQ) Permit Applicability Determination letter dated February 9, 2023, attached as Appendix D, the existing Processing Plant at the Kings Mountain facility is incapable of processing the spodumene concentrate that will be produced by the proposed Concentrator. The output from the proposed mine and Concentrator would be a mineral product. The existing Processing Plant is a chemical plant using chemical raw materials rather than mineral raw materials, and it lacks the equipment necessary to process mineral products from the mine/Concentrator. Although under “common control” and on “contiguous or adjacent property” as the existing Processing Plant, the proposed

mine/Concentrator would be a separate stationary source under Prevention of Significant Deterioration (PSD) criteria, because the proposed project and the existing facility would operate under different Standard Industrial Classification (SIC) codes, and neither would serve as a support facility for the other.

Since the mine/Concentrator is not considered one of the 28 listed source categories, and as a separate stationary source, the mine/Concentrator will be a PSD minor source with Potential to Emit (PTE) less than 250 tons per year (tpy) of any regulated pollutant. Additionally, since the source is not a listed source category, fugitive emissions do not need to be included for the purposes of determining whether the mine/Concentrator is a "major source" subject to PSD per 40 CFR 51.166(b)(1)(iii), which is incorporated by reference in 15A NCAC 2D.0530(b).

A Zoning Consistency Determination is provided in Appendix E.

2. FACILITY OVERVIEW

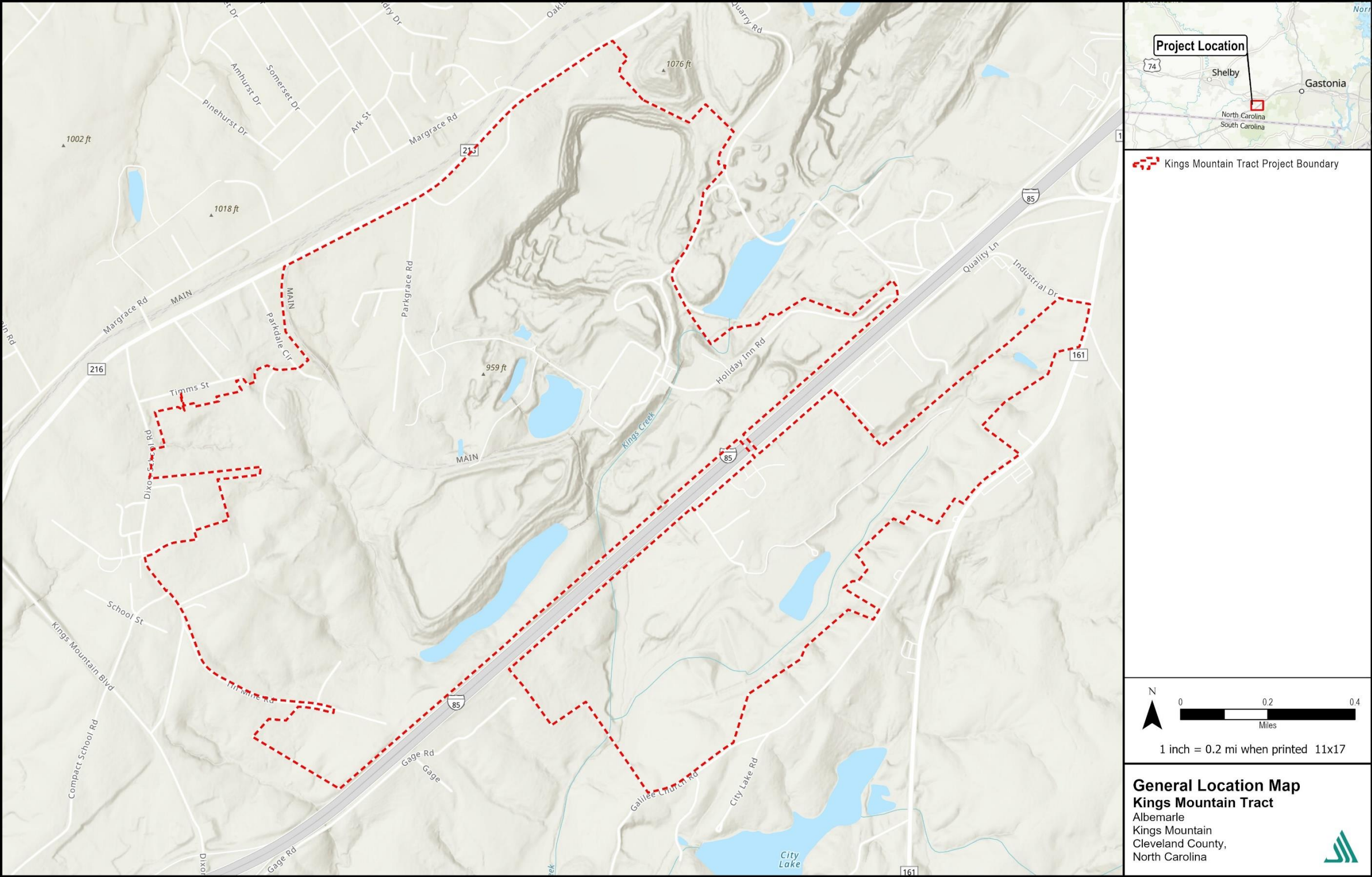
The project site is located in Kings Mountain off Interstate Highway 85, approximately 30 miles west of Charlotte, North Carolina and approximately 4 miles north of the North Carolina/South Carolina state line in Cleveland County, North Carolina. The pre-existing Kings Mountain Lithium Mine has been inactive since the 1980s. Land use surrounding the project area is generally made up of industrial and commercial businesses intermixed with residential areas and forested rolling terrain. According to the United States Census Bureau 2020 census data, Cleveland County has a population of 99,519 (U.S. Census Bureau 2022).

Proposed point sources include dust collectors associated with rock crushing, conveying, and screening and combustion sources to support the mine and concentrator operations. Fugitive emissions sources associated with the Project include unpaved haul roads, mining activities, storage piles (if material contains silt and is not water saturated), and material handling. Mobile fugitive emission sources are not included as part of this application.

A general area map showing the Kings Mountain tract is provided as Figure 1. A general area map showing the relative location of the Archdale tract with respect to the Kings Mountain tract is provided as Figure 2. A map of the Kings Mountain tract is provided as Figure 3.

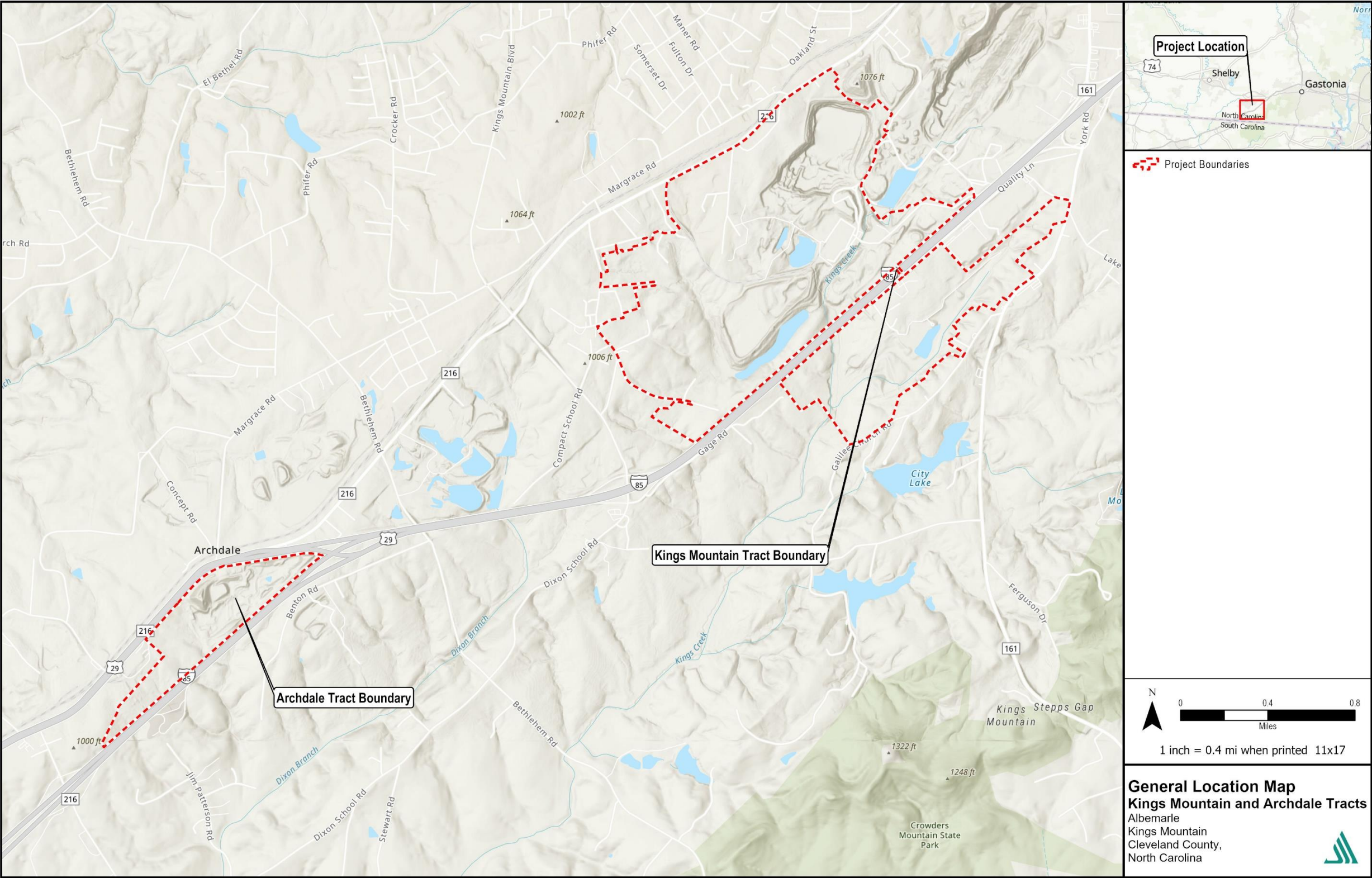
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Figure 1. General Area Map



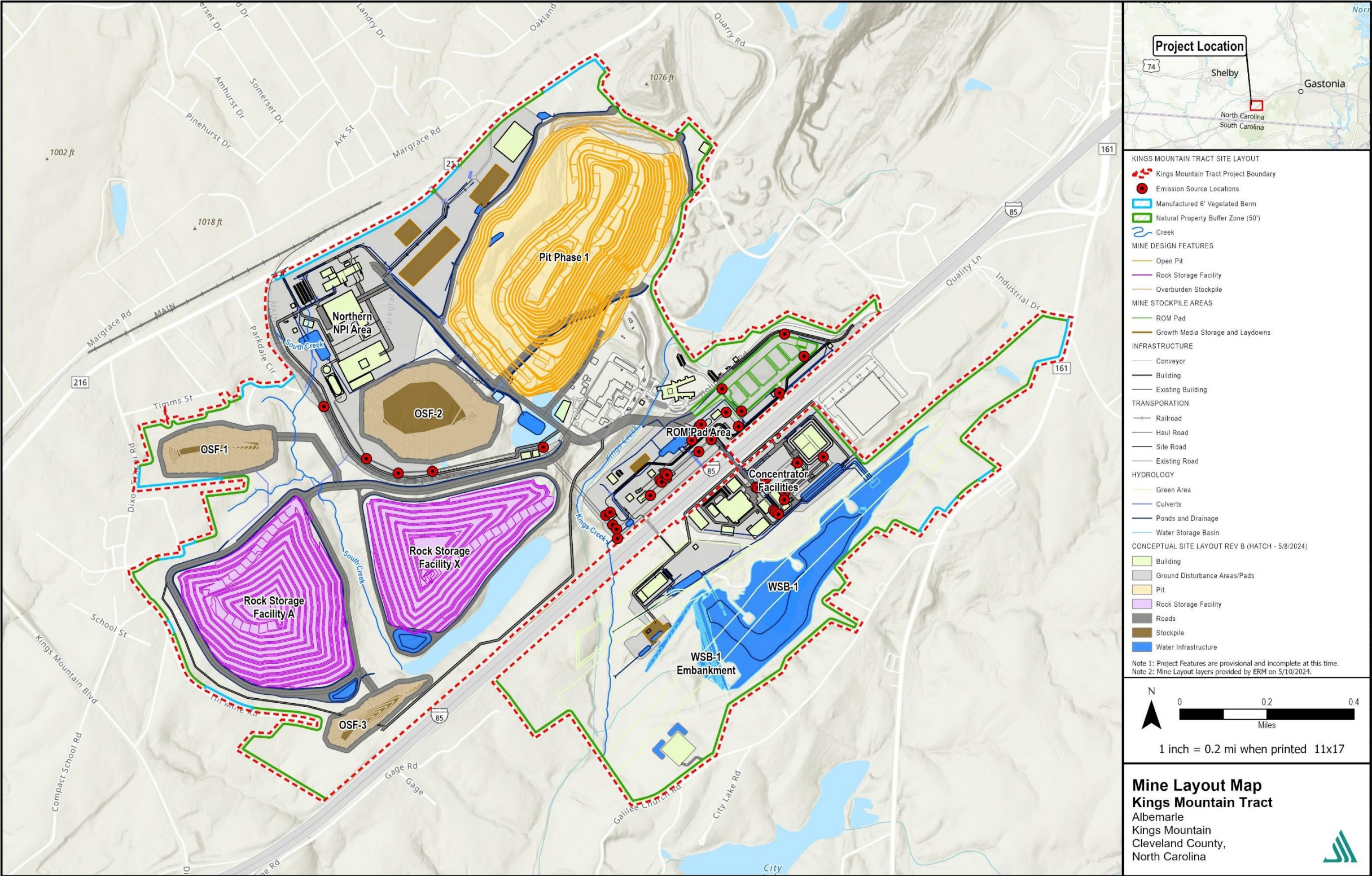
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Figure 2. Extended General Area Map Including Archdale



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Figure 3. Site Map



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3. PROCESS DESCRIPTION

Ore is removed from the mine to be processed through circuits for primary crushing, secondary crushing, ore sorting, and tertiary crushing to reduce the size of the material sufficiently before being saturated with water and fed into the wet processes in the Concentrator. The concentrated spodumene product then undergoes magnetic separation to remove magnetized material for disposal while the remaining material is sent off-site via truck and rail.

The process begins with blasting in the mine pit, which will produce ore and waste rock. Waste rock will be transported by truck to on and off-site storage areas. If necessary, rock breaking will occur to reduce the size of the ore to allow it to be transported by truck.

Ore will be sent by truck to the ROM Pad (ES-029), which serves as feedstock management to the remainder of the process. Waste rock (containing no ore) will be placed in onsite storage piles or sold to offsite aggregate producers.

Ore from the ROM pad is discharged by truck to the Apron Feeder Conveyor (ES-028a) which feeds the Vibrating Grizzly Screen (ES-028b). The ore is then transferred into the Primary Crusher (ES-028c) before being discharged to a sacrificial product conveyor (ES-028d). Dust is collected at strategic locations around the primary crushing station. The dust is then filtered from the air by the Primary Crusher Baghouse (CD-028) which is periodically discharged onto the crusher product conveyor.

After being initially reduced in size by a primary crusher system, the plant feed is conveyed (ES-023a, ES-026, and ES-027) to a single deck inclined scalping screen (ES-023b) which separates coarse material and discharges it into the Secondary Crusher Feed Bin (ES-023c) to be fed via the Secondary Crusher Belt Feeder (ES-023d) for further size reduction in the Secondary Cone Crusher (ES-023e) to prepare it for ore sorting by the Sorting Sizing Screen (ES-020a), with the undersize being recombined with the crusher product downstream. The Secondary Crusher Baghouse (CD-023) removes dust at strategic locations within the secondary crushing circuit before being returned to the downstream conveyor belt system (ES-023f and ES-023g).

Material sorted by the Sorting Sizing Screen (ES-020a) is conveyed by the Coarse Sorting Conveyor (ES-020b) and the Fine Sorting Conveyor (ES-020c) to the Coarse and Fine Sorter Feed Bins (ES-016a and ES-016c). The Sorting Sizing Screen Baghouse (CD-020) removes dust at strategic locations within the sorting sizing screen circuit before being returned to the downstream conveyor belt system.

The ore sized by the Sorting Sizing Screen is conveyed separately to the Coarse Sorter Feed Bin (ES-018a) and the Fine Sorter Feed Bin (ES-018c). The material is then withdrawn at a controlled rate via belt feeders (ES-018b and ES-018d) and discharged into the Coarse/Fine Sorting Machines (ES-016a and ES-016b) where additional separation of ore from waste rock occurs. Optionally, the Sorter Bypass Conveyors (ES-017a/b) can be used to transfer material directly to the tertiary crushing circuit. The sorting machines reject waste material, discharging it

110 onto a common sorted waste conveyor (ES-030) to be collected in the Sorter Rejects Bin (ES-
111 024), while the ore is collected on a common conveyor (ES-019) for downstream tertiary sizing
112 and crushing. Baghouses (CD-016, CD-018, and CD-020) remove dust at strategic locations
113 within the sorting machine circuit. The dust is then filtered before being returned to the Tertiary
114 Crushing Feed Conveyor (ES-019). The Tertiary Crushing Feed Conveyor transfers material to
115 the Tertiary Crusher Sizing Screens (ES-022a and ES-022b). Ore is then conveyed (ES-022c)
116 to the Tertiary Crusher Feed Bin (ES-021a). It is then withdrawn at a controlled rate via one of
117 two belt feeders (ES-021b and ES-021c) and is discharged into one of two Tertiary Cone
118 Crushers (ES-021d and ES-021e). The crushers reduce the material size before discharging it
119 onto a common conveyor (ES-021f) for downstream screening. The Tertiary Crusher Sizing
120 Screens (ES-022a and ES-022b) size the material into an oversized and an undersized fraction
121 which are conveyed either back to the tertiary crushing process (oversized) or to the plant feed
122 stockpile (undersized). Baghouses (CD-021 and CD-022) remove dust at strategic locations
123 within the tertiary crushing circuit. The dust is then filtered before being returned to the
124 downstream conveyor belt system (ES-031, ES-035, and ES-040a).

125 After tertiary crushing, ore is transported across I-85 by conveyor to the Plant Feed Stockpile
126 (ES-040b) adjacent to the Concentrator. Since the Concentrator processes occur in water,
127 material entering the Concentrator is sufficiently wetted to prevent dust emissions.

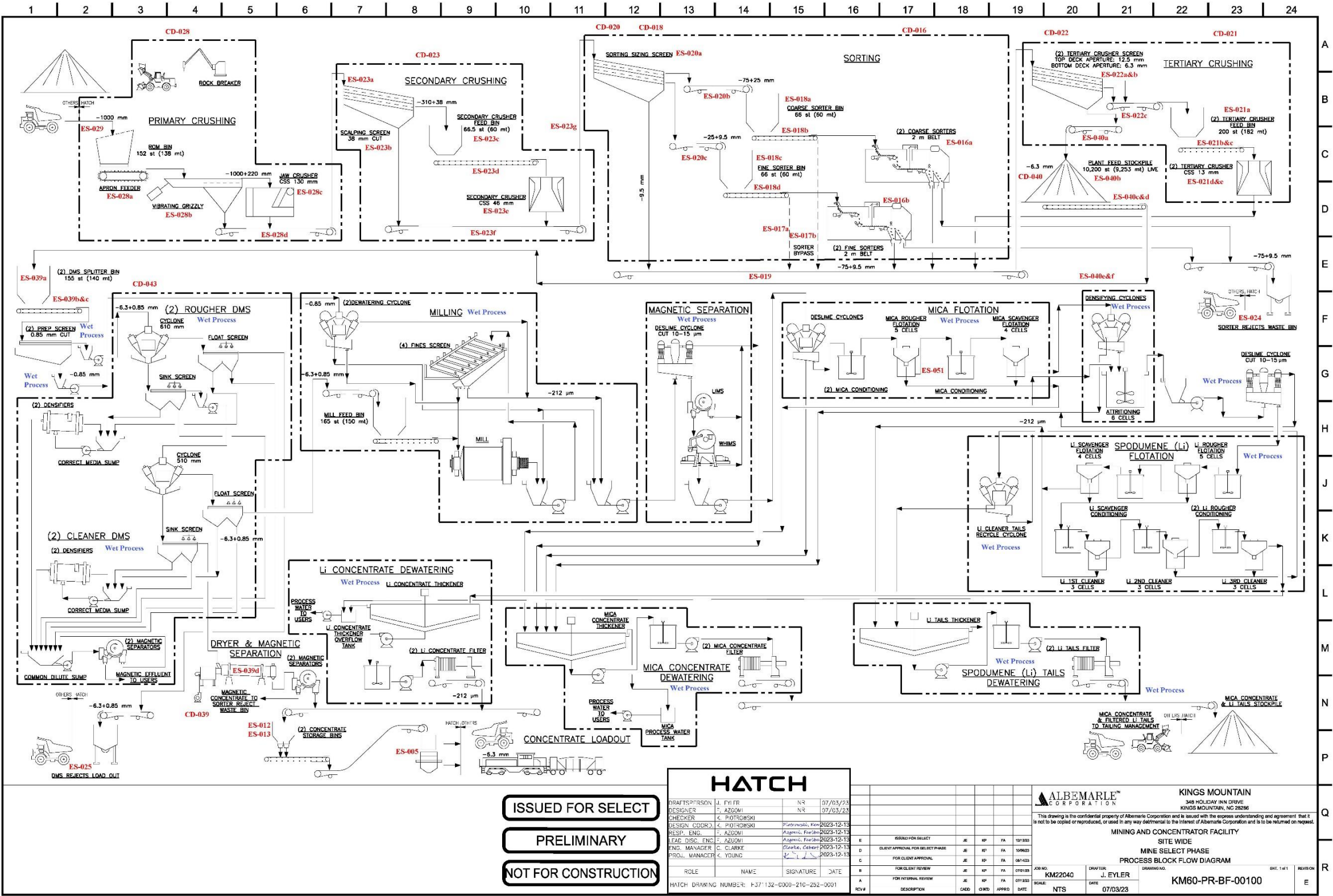
128 The material is conveyed to the DMS Feed Bin (ES-039a) before being transferred to a prep
129 screen by DMS Belt Feeders #1 and #2 (ES-039b and ES-039c). The material is saturated by
130 sprayers on the prep screen and the process is sufficiently wet to prevent dust emissions until
131 the material is dried downstream. The wet material undergoes dense media separation, wet
132 milling, magnetic separation, and further flotation separation in the Concentrator. Dense media
133 separation (DMS) separates concentrated spodumene product from other material that does not
134 contain spodumene. Streams from the DMS process are wet-milled to reduce size and then
135 undergo a 2-stage flotation separation process which results in concentrated spodumene
136 product, and tailings (material that contains no spodumene). The spodumene concentrate
137 produced in the DMS circuit will be dried in the natural gas-fired dryer (ES-039d) before
138 undergoing final magnetic separation (ES-043a through ES-043e) to remove undesirable
139 magnetic material to be conveyed via the Coarse Magnetics Conveyor (ES-043f) to the DMS
140 Rejects Bin (ES-025). The concentrated spodumene product is conveyed via the Coarse
141 Concentrate Conveyor (ES-043g) to the Concentrate Load Out Bins (ES-012 and ES-013).
142 Baghouses (CD-039 and CD-043) remove dust at strategic locations within the Concentrator
143 before the material is wetted and after the material exits the dryer.

144 The filtered tailings are conveyed across I-85 to a truck load out station for shipment to the off-
145 site Archdale storage facility. The spodumene concentrate produced in the DMS and flotation
146 processes is also transported by conveyor across I-85 to a railcar loading station (ES-005) for
147 shipment.

148 A process flow diagram is provided as Figure 4 below. The location of the emission sources is
149 provided in Figures 5 and 6 below.

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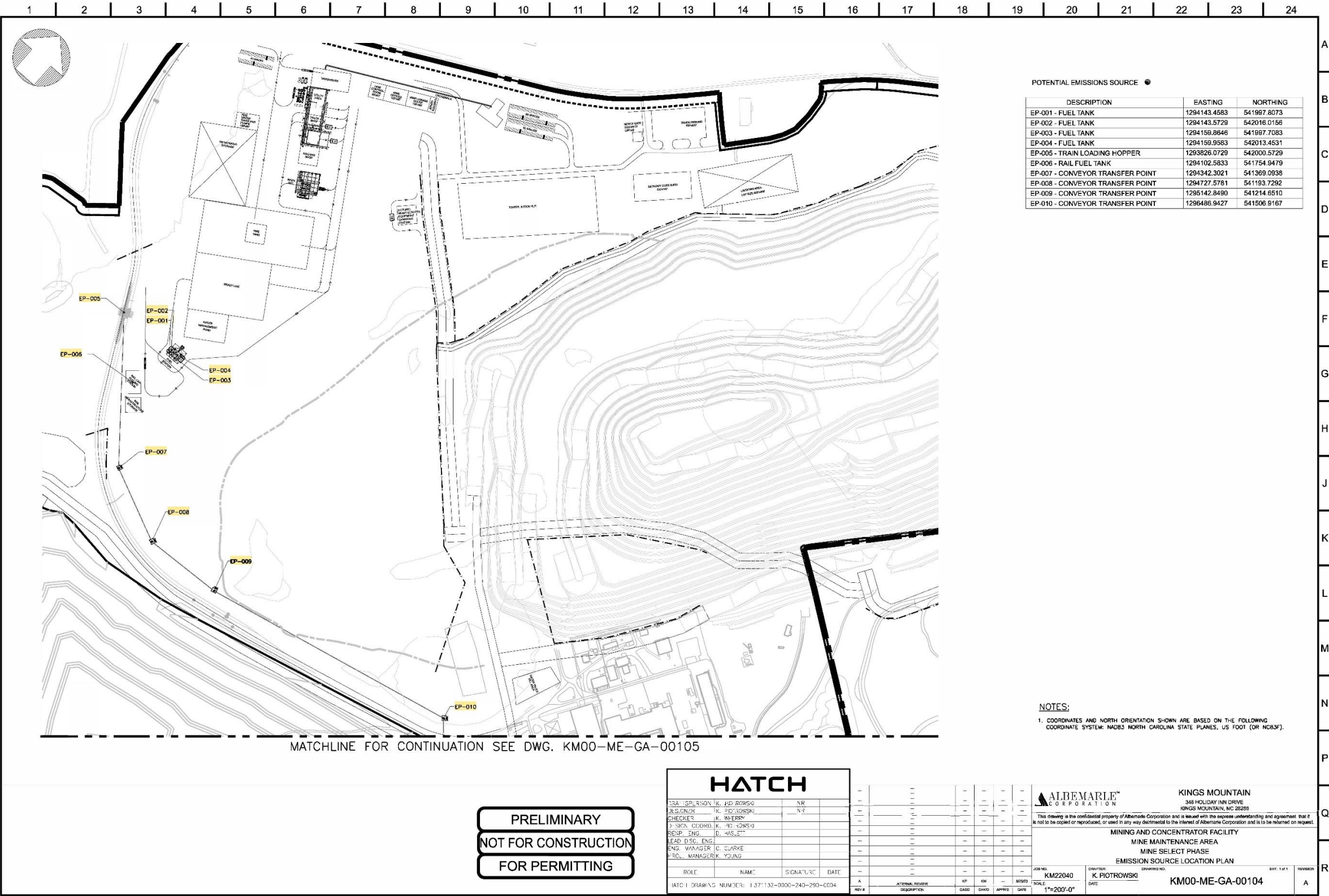
Figure 4. Process Flow Diagram



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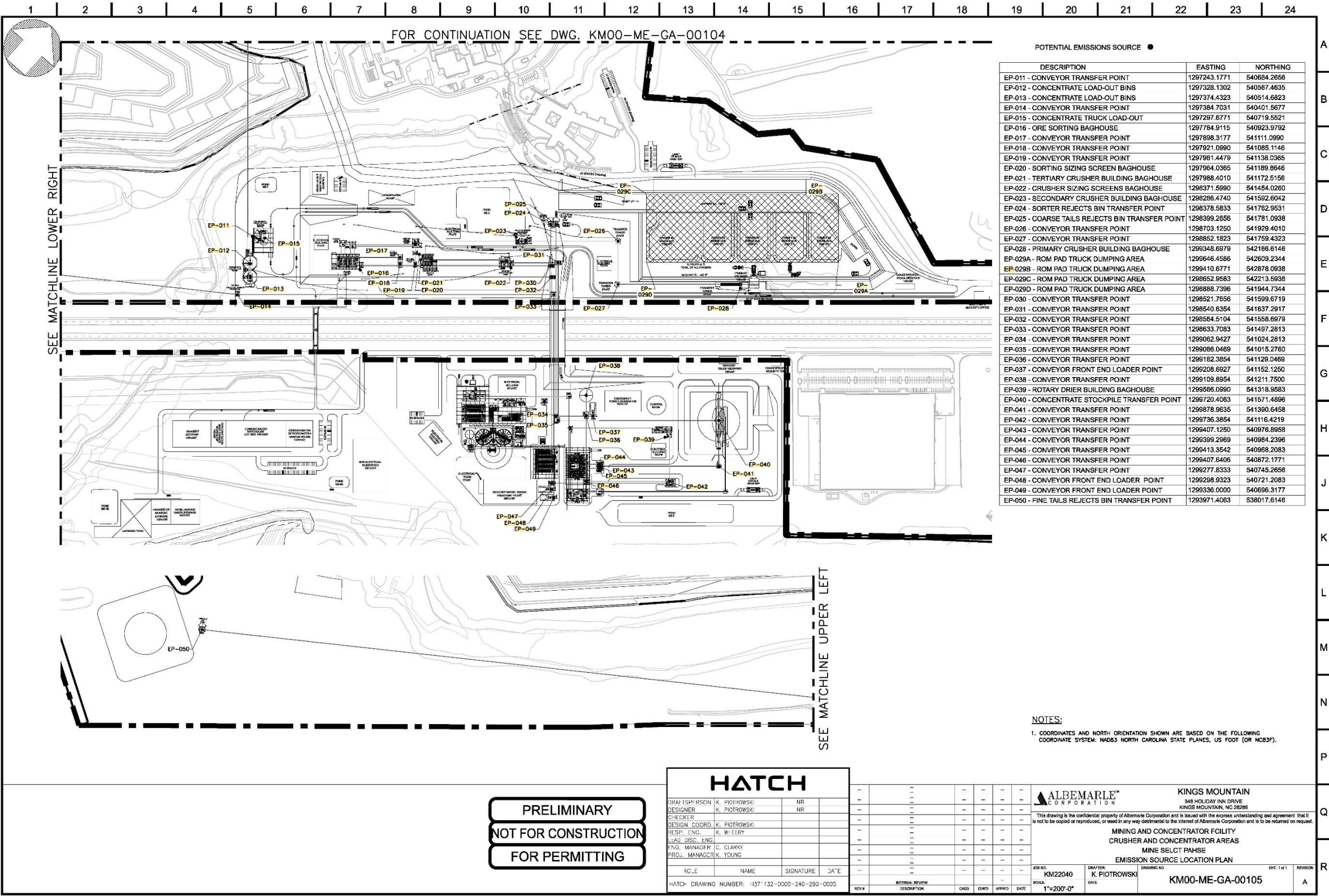
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Figure 5. Emission Source Location Map #1



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Figure 6. Emission Source Location Map #2



4. POTENTIAL-TO-EMIT EMISSION CALCULATIONS

The following section provides the basis for the potential-to-emit (PTE) calculations for emissions associated with the Project. PTE emission calculations are based on the maximum hourly capacity of each emission unit operating for 8,760 hours per year. The emission calculation methodology is described in further detail below.

Emissions Summary

The PTE and projected actual emissions of criteria pollutants and HAPs for the proposed mine and Concentrator emission units are summarized in Table 1 and are compared to the Title V and PSD permitting thresholds. Hazardous air pollutants (HAPs) are comprised of 188 compounds that EPA regulates under the Clean Air Act.

Table 1: Source PTE for Criteria Pollutants and HAPs (tons per year)

Pollutants	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	Single HAP (Hexane)	Total HAP	GHG (CO ₂ e)
Total Uncontrolled Emissions (PTE)	22.84	4.33	7.32	11.53	0.62	20.71	0.25	0.27	3,467
Total Controlled Emissions (Actual)	3.19	1.36	7.32	11.53	0.62	12.71	0.25	0.27	3,467
Title V Permitting Thresholds	100	100	100	100	100	100	10	25	-
Prevention of Significant Deterioration Threshold	250	250	250	250	250	250	-	-	-

The proposed facility totals are below Title V thresholds as the PTE emissions are less than 100 tpy for each criteria pollutant and are less than 10 tpy of an individual HAP and 25 tpy of total HAPs. Therefore, the Project is classified as a non-Title V source.

Cleveland County is designated as in attainment for all criteria pollutants, and the facility is not included in the 28 listed categorical sources for PSD. Therefore, the Project is also a PSD minor source since the PTE for each criteria pollutant is less than 250 tpy.

Below is a discussion of the methods used to calculate potential and projected emissions from the emission sources at the Kings Mountain facility. PTE emissions were estimated using the

maximum hourly capacity of each emission unit operating for 8,760 hours per year. Projected emissions were estimated using anticipated hours of operation for each circuit in the facility. Dust emissions are generated in the mine by scalpers, crushers, screens, transfer equipment, storage piles, haul trucks, drilling, and blasting. Fugitive emissions from haul trucks, drilling, and blasting are not included as part of the PTE since the facility is not a named categorical source. Material streams and processes with a moisture content of 10% or greater are assumed to produce no fugitive dust and are not included as air emission sources. According to USEPA AP-42 Section 11.19 - Construction Aggregate Processing, "some of the individual operations such as wet crushing and grinding, washing, screening, and dredging take place with "high" moisture (more than about 1.5 to 4.0 weight percent). Such wet processes do not generate appreciable particulate emissions (USEPA 1995)."

Ore Crushing and Sorting Emissions

Material processing emission factors from AP-42, Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing and Chapter 13.2.4 Aggregate Handling and Storage Piles were used to calculate fugitive dust emissions based on maximum material throughputs for material processing equipment, transfer points, and storage piles.

Dust from the significant ore processing emission sources (e.g., crushers, sorters, sizing screens, and conveyors) is controlled by baghouses (CD-016, CD-018, CD-020, CD-021, CD-022, CD-023, and CD-040). Fans induce air flow to capture the majority of dust generated. The filters are cleaned by air pulses, and the dust collected is screw conveyed to belt conveyors to be either processed or disposed of downstream. Dust from the storage bins is controlled by bin vent filters (CD-024, and CD-025). Dust collector emission calculations are based on collection efficiency of 95% and a device control efficiency of 99%. The control devices are listed in Table 2 below with the associated emission sources. Specification sheets for the dust collection systems are provided in Appendix C.

Table 2: Ore Crushing and Sorting Control Devices and Associated Emission Sources

Control Device	Control Device Description	Associated Emission Sources	Emission Point
CD-016	Ore Sorting Baghouse	ES-016a and ES-016b, ES-019, ES-030	EP-016
CD-018	Sorter Bypass Conveyor Baghouse	ES-017a, ES-017b, ES-018 through ES-018d	EP-018
CD-020	Sorter Sizing Screen Baghouse	ES-020a, ES-020b, ES-020c	EP-020
CD-021	Tertiary Crusher Baghouse	ES-021a through ES-021f	EP-021
CD-022	Tertiary Sizing Screen Baghouse	ES-022a, ES-022b, ES-022c, ES-031	EP-022
CD-023	Secondary Crusher Baghouse	ES-023a through ES-023g, ES-026, ES-027	EP-023
CD-028	Primary Crusher Baghouse	ES-028a through ES-028d	EP-028
CD-040	Stockpile Sizing Screen Baghouse	ES-035, ES-040a through ES-040f	EP-040

Concentrator and Material Load Out Emissions

The majority of the processes in the Concentrator consist of a slurry of minerals mixed with water and chemical reagents added to enhance material separation. These wet processes produce no particulate emissions. The volatile organic compounds (VOC) contained in the chemical reagents are conservatively assumed to fully evaporate. The only reagent that contains VOC is methyl isobutyl carbinol (ES-051). Methyl isobutyl carbinol is not a listed HAP. All other reagent usage operations qualify as an insignificant activity (IES-112). SDSs for each reagent are provided in Appendix C.

Emissions from the 30 MMBtu/hr natural gas-fired dryer (ES-039d) were calculated using factors from AP-42, Chapter 1.4 Natural Gas Combustion. Process-generated particulate emission factors for the rotary dryer are based on facility design parameters. A dedicated baghouse (CD-039) collects dust generated during the drying process. A baghouse (CD-043) collects dust generated during subsequent magnetic separation once the spodumene concentrate has been dried.

Spodumene concentrate is conveyed to the Concentrate Load Out Bins (ES-012 and ES-013) from which it will primarily be conveyed to the Rail Load Out Bin (ES-005) to be shipped off-site via rail. Spodumene concentrate may alternatively be loaded to trucks via the Truck Load Out Stacker Conveyor (ES-015). Rejected material from the ore sorter and the DMS operations are conveyed to the Sorter Rejects Bin (ES-024) and the DMS Rejects Bin (ES-025), respectively. Filtered tailings are sufficiently wet that no emissions will be generated, therefore, the tailings handling operations are not included as emission sources. Dust from the storage bins is controlled by bin vent filters (CD-005, CD-012, CD-013, CD-024, CD-025). The control devices are listed in Table 3 below with the associated emission sources.

Table 3: Concentrator and Material Load Out Control Devices and Associated Emission Sources

Control Device	Control Device Description	Associated Emission Sources	Emission Point
CD-005	Rail Load Out Bin Vent Filter	ES-005	ES-005
CD-012	Concentrate Load Out Bin Vent Filter	ES-012	ES-012
CD-013	Concentrate Load Out Bin Vent Filter	ES-013	EP-013
CD-024	Sorter Rejects Bin Vent Filter	ES-024	EP-024
CD-025	DMS Rejects Bin Vent Filter	ES-025	EP-025
CD-039	DMS Dryer Baghouse	ES-039a through ES-039d	EP-039
CD-043	DMS and Mag Sep Baghouse	ES-032, ES-042, ES-043a through ES-043g, ES-047	EP-043

Emergency Engines

A diesel emergency generator (IES-110) and a diesel emergency fire pump engine (IES-111) are used to power various equipment in the plant during power outage events and for fire

control, respectively. Both engines are rated at 536 hp. These sources are both classified as insignificant activities under the definition of “insignificant activities because of size or production rate” in 15A NCAC 02Q .0503(8) as the potential emissions of each criteria pollutant is below five tpy and the potential emissions of each HAP is below 1,000 pounds per year. Emissions from the engines were calculated using the applicable standards from NSPS Subpart IIII and AP-42, Chapter 3.3 Gasoline and Diesel Industrial Engines. Diesel storage tank emissions were estimated using the Oklahoma DEQ Online Storage Tank Emissions Calculation Tool as recommended by NC DAQ. The storage tanks are classified as insignificant activities under the definition of “insignificant activities because of size or production rate” in 15A NCAC 02Q .0503(8) as the potential emissions of each criteria pollutant is below five tpy and the potential emissions of each HAP is below 1,000 pounds per year.

5. AIR QUALITY REGULATORY REVIEW

This section documents the applicability determinations made for federal and state air regulations. This summary does not address regulatory applicability of the existing Processing Plant, which has been determined by NC DEQ to be a separate source since it operates independently and cannot process the spodumene concentrate produced by the Concentrator.

Federal air quality regulations reviewed include Title 40, Code of Federal Regulations, Part 52, PSD program (40 CFR 52); Part 60, New Source Performance Standards (40 CFR 60); Part 61, pollutant-specific National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR 61); Part 63, source category NESHAPs (40 CFR 63); Part 68, Risk Management Prevention (RMP) regulations (40 CFR 68); Part 70, Title V Operating Permit regulations (40 CFR 70); and Part 82, stratospheric ozone regulations (40 CFR 82).

DEQ regulations fall under two main categories: generally applicable regulations under 15A NCAC 02Q (e.g., permitting requirements) and specific applicability regulations under 15A NCAC 02D (e.g., particulate matter (PM) standards for manufacturing equipment). This application details the applicability of source-specific regulations in 15A NCAC 02D.

Title V Source Classification

The Title V program only regulates emissions from “major” stationary sources of regulated pollutants. A stationary source is considered “major” under the Title V program if the facility:

- has actual or potential emissions at or above the major source thresholds of 100 tpy for any “criteria pollutant” or
- has HAP emissions of 10 tpy of any single HAP or 25 tpy for any combination of HAPs.

As shown in Table 1 and Appendix B, facility-wide potential emissions of all criteria pollutants are each less than 100 tpy and HAP emissions fall below their respective thresholds of 10 and 25 tpy. Therefore, the Kings Mountain facility is a minor source with respect to Title V.

PSD Source Classification

The Project is located in Cleveland County, which is designated as “attainment” or “unclassifiable” for all criteria pollutants. The PSD program only regulates emissions from “major” stationary sources of regulated pollutants located in attainment areas. A stationary source is considered “major” under the PSD program if the facility:

- belongs to one of the 28 named source categories in 40 CFR 51.166(b)(1)(i)(a) and has a PTE of 100 tpy of any pollutant subject to regulation; or
- has a PTE of 250 tpy or more of any pollutant subject to regulation, regardless of its source category.

This facility is not one of the 28 names source categories, therefore, the 250 tpy threshold applies and does not include fugitive emissions. As shown in Table 1 and Appendix B, facility-

wide potential emissions of all pollutants subject to regulation are each less than 250 tpy. Therefore, the Kings Mountain facility is a minor source with respect to PSD.

New Source Performance Standards

NSPS require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to a NSPS is also subject to the general provisions of NSPS Subpart A, except as noted. The NC DEQ has been delegated by the United States Environmental Protection Agency (EPA) to regulate facilities subject to NSPS. Regulatory requirements for facilities subject to NSPS are contained in 15A NCAC 02D.0524 and 40 CFR Part 60. The following sections discuss NSPS that were considered for applicability, and the basis for applicability/non-applicability of each.

Table 4: New Source Performance Standards Applicability Determination

Subpart	Subject	Applicability
A	General Provision	Yes
LL	Standards of Performance for Metallic Mineral Processing Plants	No
OOO	Standards of Performance for Nonmetallic Mineral Processing	Yes
UUU	Standards of Performance for Calciners and Dryers in Mineral Industries	No
III	Standards of Performance for Compression Ignition Internal Combustion Engines	Yes

NSPS Subpart A – General Provisions

NSPS Subpart A contains general requirements for notification, testing, and reporting for the NSPS program. The subpart applies to each project that has an affected source as defined under another subpart. As the project has units subject to one or more standards under 40 CFR 60 as discussed below, subpart A applies to the facility.

NSPS Subpart LL – Metallic Mineral Processing Plants

The affected facilities under NSPS Subpart LL are various processing equipment at metallic mineral processing plants: each crusher and screen in open-pit mines; each crusher, screen, bucket elevator, conveyor belt transfer point, thermal dryer, product packaging station, storage bin, enclosed storage area, truck loading station, truck unloading station, railcar loading station, and railcar unloading station at the mill or concentrator. A metallic mineral concentrate is defined as containing at least one of the following metals in any of its oxidation states and at a concentration that contributes to the concentrate's commercial value: Aluminum, copper, gold, iron, lead, molybdenum, silver, titanium, tungsten, uranium, zinc, and zirconium. Since the spodumene ore is being processed for only its lithium content, this subpart does not apply.

NSPS Subpart OOO – Nonmetallic Mineral Processing

The affected facilities under NSPS Subpart OOO are each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, and enclosed truck or railcar loading station. A particulate matter emission limit of 0.014 gr/dscf applies to all

307 equipment with capture systems, and an opacity limit of 7% applies to dry control devices on
308 individual enclosed storage bins and other fugitive emission sources. The facility will comply
309 with all applicable requirements and will ensure compliance through VE observations,
310 maintenance programs, and parametric monitoring.

311 This subpart applies to:

312 ES-028a through ES-028d – Primary Crushing Operations

313 ES-027 – Scalping Screen Feed Conveyor #1

314 ES-026 – Scalping Screen Feed Conveyor #2

315 ES-023a through ES-023g – Secondary Crushing Operations

316 ES-020a through ES-020c – Sorting Sizing Screen

317 ES-017a and ES-017b – Sorting Bypass Conveyor #1 and #2

318 ES-018 – Sorting Bypass Conveyor #2

319 ES-016a, ES-016b, ES-018a through ES-018d – Ore Sorting Operations

320 ES-022a through ES-022c – Tertiary Crusher Sizing Screens #1/#2

321 ES-019 – Tertiary Crushing Feed Conveyor

322 ES-021a through ES-021e – Tertiary Crushing Operations

323 ES-030 – Sorter Rejects Conveyor

324 ES-031 – Stockpile Feed Conveyor #1

325 ES-035 – Stockpile Feed Conveyor #2

326 ES-040a through ES-040d – Plant Feed Stockpile Operations

327 ES-041 – Stockpile Discharge Conveyor

328 ES-043a through ES-043g – DMS and Magnetic Separation Operations

329 ES-039a through ES-039d – DMS Dryer Operations

330 ES-032, ES-042, ES-047 – DMS Dryer Discharge Conveyors

331 ES-005 – Rail Load Out Station

332 ES-007, ES-008, ES-009, ES-010 – Rail Load Out Conveyors

333 ES-011 – Concentrate Truck Load Out Belt Feeder

334 ES-012, ES-013 – Concentrate Load Out Bins

335 ES-015 – Truck Load Out Stacker Conveyor

336 ES-024 – Sorter Rejects Bin

337 ES-025 – DMS Rejects Bin

This subpart does not apply to wet material processing operations as defined in 40 CFR 60.671 and therefore it is not applicable to emission sources located within the Concentrator.

NSPS Subpart UUU – Calciners and Dryers in Mineral Industries

The affected facilities under NSPS Subpart UUU are each calciner and dryer at a mineral processing plant. *Mineral processing plant* means any facility that processes or produces any of the following minerals, their concentrates or any mixture of which the majority (>50 percent) is any of the following minerals or a combination of these minerals: alumina, ball clay, bentonite, diatomite, feldspar, fire clay, fuller's earth, gypsum, industrial sand, kaolin, lightweight aggregate, magnesium compounds, perlite, roofing granules, talc, titanium dioxide, and vermiculite. As none of these minerals are being produced, this subpart does not apply.

NSPS Subpart IIII – Compression Ignition Internal Combustion Engines

The affected facilities under NSPS Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) are stationary compression ignition (CI) internal combustion engines (ICE), which commenced construction after July 11, 2005, and were manufactured after April 1, 2006. The Project has two diesel-fired emergency engines (IES-110 and IES-111) each rated at 536 hp. The engines were manufactured after April 1, 2006, and will commence construction after July 11, 2005. Therefore, the engines are subject to Subpart IIII. The engines will be EPA-certified by the manufacturer to meet the applicable emission standards under NSPS Subpart IIII. The facility will comply with NSPS Subpart IIII by using ultra-low sulfur diesel, tracking hours of operation through a non-resettable hour meter, and operating the engine in accordance with manufacturers' written instructions.

National Emissions Standards for Hazardous Air Pollutants (NESHAP)

NESHAP are emission standards for HAP that apply to major sources of HAP (facilities that exceed the major source thresholds of 10 tpy of a single HAP or 25 tpy of any combination of HAP) or listed area sources. Moreover, any source subject to a NESHAP is also subject to the general provisions of NESHAP Subpart A, except as noted. Regulatory requirements for facilities subject to NESHAP are contained in 15A NCAC 02D .1110-.1111 and 40 CFR Part 61 and Part 63. Since HAP emissions are limited to below the major source level in Condition A.10, the Albemarle Kings Mountain facility is classified as an area source of HAP. There are no Part 61 NESHAP regulations that apply to the facility. However, certain Part 63 NESHAP regulations apply to area sources of HAP and are summarized below.

Table 5: National Emission Standards for Hazardous Air Pollutants Applicability Determination

Subpart	Subject	Applicability
A	General Provision	Yes
ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	Yes

Subpart	Subject	Applicability
JJJJJJ	National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources	No
VVVVVV	National Emissions Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources	No

40 CFR 63 Subpart A – General Provisions

40 CFR 63 Subpart A (General Provisions) contains general requirements for notification, testing, and reporting for the NESHAPs program. The subpart applies to each project that has an affected source as defined under another subpart. As the project will have units subject to one or more standards under 40 CFR 63, subpart A applies.

40 CFR 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

40 CFR 63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants: Stationary Reciprocating Internal Combustion Engines) applies to facilities that own or operate a stationary reciprocating ICE at a major or area source of HAP emissions. As stated above, the facility operates engines which are subject to the requirements outlined in NSPS Subpart IIII.

Pursuant to 40 CFR 63.6590(c), compliance with Subpart ZZZZ is demonstrated by complying with the requirements of NSPS Subpart IIII, and no further requirements of Subpart ZZZZ apply.

40 CFR 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers Area Sources

NESHAP Subpart JJJJJJ contains requirements for owners and operators of industrial, commercial or institutional boilers located at an area source of HAP. Albemarle's rotary DMS dryer (ES-039) is a direct-fired heater, which does not meet the definition of an industrial, commercial or institutional boiler. Therefore, there are no units at the facility that are subject to the requirements of NESHAP Subpart JJJJJJ.

40 CFR 63 Subpart VVVVVV – Chemical Manufacturing Area Sources

The Kings Mountain Lithium Mine facility is not considered a chemical manufacturing process unit since it does not use, produce, or process any HAP regulated by NESHAP Subpart VVVVVV. Therefore, NESHAP Subpart VVVVVV is not applicable to this project.

Risk Management Plan Regulations

Subpart B of 40 CFR Part 68 outlines the requirements for RMP plans pursuant to Section 112(r) of the Clean Air Act. Applicability of the Subpart is determined based on the type and quantity of chemicals stored at the facility. The Kings Mountain facility does not store any regulated chemical above threshold quantities; therefore, the facility is not subject to the RMP requirements of 40 CFR Part 68.

Title V Operating Permit Program

40 CFR Part 70 establishes the federal Title V Operating Permit program. North Carolina has incorporated the provisions of this federal program in its Title V Operating Permit program under

15A NCAC 02Q .0500. The major source thresholds with respect to North Carolina's Title V Operating Permit program regulations are 10 tpy of a single HAP, 25 tpy of any combination of HAP, and 100 tpy of any criteria pollutants. Potential emissions of all pollutants are below their respective thresholds. Therefore, the Kings Mountain facility is not subject to the Title V permit program requirements. See Table 1 and Appendix B for detailed facility-wide potential emissions calculations for all criteria pollutants and HAPs.

Stratospheric Ozone Protection Regulations

The requirements originating from Title VI of the Clean Air Act, entitled Protection of Stratospheric Ozone, are contained in 40 CFR Part 82. Subparts A through E and Subparts G and H. Subpart F (Recycling and Emissions Reduction) potentially applies if the facility maintains, services, or disposes of appliances that utilize Class I or Class II ozone depleting substances. Subpart F generally requires persons completing the repairs, service, or disposal to be properly certified. All repairs, service, and disposal of ozone depleting substances from any chillers and air conditioners at the facility will be completed by a certified technician.

State Applicability Analysis

North Carolina's State Implementation Plan (SIP) is codified under 15A NCAC. The regulatory analysis for the Kings Mountain facility is presented in the following sections.

Table 6: State Applicability Determination

Rule	Subject	Applicability
15A NCAC 02D.0100-.0300 15A NCAC 02Q.0100-.0400	General Regulations	Yes
15A NCAC 02D.0503	Particulates from Fuel Burning Indirect Heat Exchangers	No
15A NCAC 02D.0509	Particulates from Mica or Feldspar Processing Plants	No
15A NCAC 02D.0510	Particulate from Sand, Gravel, or Crushed Stone Operations	Yes
15A NCAC 02D.0515	Particulates from Miscellaneous Industrial Processes	Yes
15A NCAC 02D.0516	Sulfur Dioxide Emissions from Combustion Sources	Yes
15A NCAC 02D.0521	Control of Visible Emissions	Yes
15A NCAC 02D.0540	Particulate from Fugitive Dust Emission Sources	Yes
15A NCAC 02D.0900	Volatile Organic Compounds	No
15A NCAC 02D.0958	Work Practices for Sources of Volatile Organic Compounds	No
15A NCAC 02D.1100 15A NCAC 02Q.0700	Control of Toxic Air Pollutants	No
15A NCAC 02D.1400	Nitrogen Oxides	No
15A NCAC 02D.1806	Control of Odors	Yes

15A NCAC 02D.0100-.0300 and 02Q.0100-.0400 – General Regulations

These are general regulatory requirements that apply to all sources in the state of North Carolina, and therefore will apply to the Kings Mountain facility.

15A NCAC 02D.0503 – Particulates from Fuel Burning Indirect Heat Exchangers

This regulation applies to all fuel burning units meeting the definition of an “indirect heat exchanger.” An indirect heat exchanger is defined as “any equipment used for the alteration of the temperature of one fluid by the use of another fluid in which the two fluids are separated by an impervious surface such that there is not mixing of the two fluids.” The rotary DMS Dryer (ES-039d) is a directed-fired heater and therefore, this regulation does not apply.

15A NCAC 02D.0509 – Particulates from Mica or Feldspar Processing Plants

This regulation does not apply to the Project equipment as the operations do not produce these materials. Although mica is removed from the process in the flotation plant, it is not a commercial product, and all the related processes are conducted in water, therefore, no emissions are generated.

15A NCAC 02D.0510 – Particulate from Sand, Gravel, or Crushed Stone Operations

This regulation applies to sand, gravel, or crushed stone operations. The rock and spodumene operations will be subject to this regulation and will comply by taking measures to reduce to a minimum any particulate matter from becoming airborne to prevent exceeding the ambient air quality standards beyond the property line. The facility will comply with the requirements of this regulation by using necessary control measures and by complying with the requirements of NSPS Subpart OOO.

15A NCAC 02D.0515 – Particulates from Miscellaneous Industrial Processes

15A NCAC 02D.0515 applies to processes with PM stack emissions not regulated by any other emission control standards. The stack emissions from the Rotary Dryer (ES-039d) are subject to emission limits calculated according to the following equations:

$$E = 4.10 P^{0.67} \text{ for } P \leq 30, \text{ or}$$

$$E = 55.0 P^{0.11} - 40 \text{ for } P > 30$$

Where E = maximum allowable PM emission rate in pounds per hour, and
P = process rate in tons per hour.

The facility will operate in such a manner as to maintain compliance with the calculated emission limits.

15A NCAC 02D.0516 – Sulfur Dioxide Emissions from Combustion Sources

This regulation applies to all combustion sources present at the facility. Specifically:

Emission of sulfur dioxide from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds of sulfur dioxide per million Btu input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. Sulfur dioxide formed or reduced as a result of treating flue gases with sulfur trioxide or other materials shall also be accounted for when determining compliance with this standard.

The facility will comply with this limit by combusting natural gas and ultra-low sulfur diesel.

15A NCAC 02D.0521 – Control of Visible Emissions

This regulation applies to all units with visible emissions. Specifically:

For sources manufactures after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to comply with Paragraph (g) of this Rule, six-minute averaging periods may exceed 20 percent opacity if:

(1) No six-minute period exceed 87 percent opacity;

(2) No more than one six-minute period exceeds 20 percent opacity in any hour; and

(3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

The facility will operate in compliance with the requirement to limit opacity to less than 20%. However, sources which must comply with a visible emissions standard in 15A NCAC 02D.0524 "New Source Performance Standards" or 15 NCAC 02D.1110 "Control of Toxic Air Pollutants" shall meet those more stringent standards in addition to the 2D.0521 visible emissions standard.

15A NCAC 02D.0540 – Particulate from Fugitive Dust Emission Sources

15A NCAC 02D.0540 restricts the emission of excess fugitive dust emissions beyond the property line that may cause or contribute to substantive complaints. The facility will operate in such a manner to comply with this regulation.

15A NCAC 02D.0900 – Volatile Organic Compounds

Per 15A NCAC 02D.0902, the regulations in this section apply to sources with the potential to emit more than 100 tons/year of VOC emissions located in Cabarrus County, Gaston County, Lincoln County, Mecklenburg County, Rowan County, Union County, Davidson Township and Coddle Creek Township in Iredell County with the exception of the following rules of this Section which apply statewide:

- .0925, Petroleum Liquid Storage in Fixed Roof Tanks, for fixed roof tanks at gasoline bulk plants and gasoline bulk terminals;
- .0926, Bulk Gasoline Plants;
- .0927, Bulk Gasoline Terminals;
- .0928, Gasoline Service Stations Stage I;
- .0932, Gasoline Truck Tanks and Vapor Collection Systems;
- .0933, Petroleum Liquid Storage in External Floating Roof Tanks, for external floating roof tanks at bulk gasoline plants and bulk gasoline terminals;
- .0948, VOC Emissions from Transfer Operations;
- .0949, Storage of Miscellaneous Volatile Organic Compounds; and
- .0958, Work Practices for Sources of Volatile Organic Compounds.

Cleveland County is not one of the listed nonattainment areas and the facility has a VOC potential-to-emit under 100 tpy, therefore, this rule does not apply.

15A NCAC 02D.0958 – Work Practices for Sources of Volatile Organic Compounds

This rule applies as follows:

This Rule applies to all facilities that use volatile organic compounds as solvents, carriers, material processing media, or industrial chemical reactants, or in other similar uses, or that mix, blend, or manufacture volatile organic compounds, or emit volatile organic compounds as a product of chemical reactions.

Cleveland County is not one of the listed nonattainment areas and the facility has a VOC potential-to-emit under 100 tpy, therefore, this rule does not apply.

15A NCAC 02D.1100 – Control of Toxic Air Pollutants – State Enforceable Only

The requirements pertaining to the control of toxic air pollutants (TAP) under 15A NCAC 02D.1100 apply if the Project is required to have a permit under 15A NCAC 02Q.0700. More specifically, pursuant to 15A NCAC 02Q.0711 (a) and (b):

510 *A permit to emit toxic air pollutants shall be required for any facility [...] whose actual rate of*
511 *emissions from all sources are greater than any one of the following toxic air pollutant permitting*
512 *emission rates.*

513 No TAP emissions exceed their respective emission rates under 15A NCAC 02Q .0711;
514 therefore, no sources of TAP emissions are subject to 15A NCAC 02D.1100.

515 **15A NCAC 02D.1400 – Nitrogen Oxides**

516 Per 15A NCAC 2D.1402, the regulations in this section apply to sources with the potential to
517 emit more than 100 tons/year of NO_x emissions located in Cabarrus County, Gaston County,
518 Lincoln County, Mecklenburg County, Rowan County, Union County, Davidson Township and
519 Coddle Creek Township in Iredell County with the exception of the following rules of this Section
520 which apply statewide:

- 521 • .1409(c) and .1416 through .1423

522 Cleveland County is not one of the listed nonattainment areas and the facility has a NO_x
523 potential-to-emit under 100 tpy, therefore, this rule does not apply.

524 **15A NCAC 02D.1806 – Control of Odors – State Enforceable Only**

525 This regulation applies to all facilities and requires that facilities take precautions to minimize or
526 eliminate odorous emissions. The facility will operate in such a manner to comply with this
527 regulation

527	APPENDIX A	NCDEQ DIVISION OF AIR QUALITY – APPLICATION FOR AIR
528		PERMIT TO CONSTRUCT/OPERATE FORMS
529		
530		

Forms A and A2-A3

FORM A

GENERAL FACILITY INFORMATION

REVISED 03/03/23

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

A

NOTE - APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

☒ Local Zoning Consistency Determination (new or modification only)	☒ Appropriate Number of Copies of Application	Application Fee (please check one option below) ☐ Not Required ☒ ePayment ☐ Check Enclosed
☒ Responsible Official/Authorized Contact Signature	☒ P.E. Seal (if required)	

GENERAL INFORMATION

Legal Corporate/Owner Name: Albemarle U.S., Inc.	
Site Name: Albemarle Kings Mountain Facility	
Site Address (911 Address) Line 1: 348 Holiday Inn Drive	
Site Address Line 2:	
City: Kings Mountain	State: North Carolina
Zip Code: 28086	County: Cleveland

CONTACT INFORMATION

Responsible Official/Authorized Contact		Invoice Contact	
Name & Title: Chris Danauskas - Site Director		Name & Title: John Kuhn - Mine Environmental Lead	
Mailing Address Line 1: 348 Holiday Inn Drive		Mailing Address Line 1: 348 Holiday Inn Drive	
Mailing Address Line 2:		Mailing Address Line 2:	
City: Kings Mountain	State: North Carolina	City: Kings Mountain	State: North Carolina
Zip Code: 28086		Zip Code: 28086	
Primary Phone No.: (302) 563-0074	Fax No.:	Primary Phone No.: (704) 734-2708	Fax No.:
Secondary Phone No.:		Secondary Phone No.:	
Email Address: chris.danauskas@albemarle.com		Email Address: john.kuhn@albemarle.com	
Facility/Inspection Contact		Permit/Technical Contact	
Name & Title: John Kuhn - Mine Environmental Lead		Name & Title: John Kuhn - Mine Environmental Lead	
Mailing Address Line 1: 348 Holiday Inn Drive		Mailing Address Line 1: 348 Holiday Inn Drive	
Mailing Address Line 2:		Mailing Address Line 2:	
City: Kings Mountain	State: North Carolina	City: Kings Mountain	State: North Carolina
Zip Code: 28086		Zip Code: 28086	
Primary Phone No.: (704) 734-2708	Fax No.:	Primary Phone No.: (704) 734-2708	Fax No.:
Secondary Phone No.:		Secondary Phone No.:	
Email Address: john.kuhn@albemarle.com		Email Address: john.kuhn@albemarle.com	

APPLICATION IS BEING MADE FOR:

☒ New Non-permitted Facility/Greenfield	☐ Modification of Facility (permitted)	☐ Renewal Title V	☐ Renewal Non-Title V
☐ Name Change Only	☐ Ownership Change	☐ Administrative Amendment	☐ Renewal with Modification

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

☐ General	☒ Small	☐ Prohibitory Small	☐ Synthetic Minor	☐ Title V
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FACILITY INFORMATION

Describe nature of (plant site) operation(s): Spodumene ore is mined and processed in order to extract spodumene concentrate that will be shipped off-site.	
Primary SIC/NAICS Code: 1479	Facility ID No.
FACILITY LOCATION: Latitude: 35.212782	Current/Previous Air Permit No. Expiration Date:
Longitude: -81.351529	

Does this application contain confidential data? ☐ YES ☒ NO ***If yes, please contact the DAQ Regional Office prior to submitting this application.*** (See Instructions)

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: Seth Gately		Firm Name: SWCA Environmental Consultants	
Mailing Address Line 1: 113 Edinburgh S Drive		Mailing Address Line 2: Suite 120	
City: Cary	State: NC	Zip Code: 27511	County: Wake
Phone No.: (479) 651-6837	Fax No.:	Email Address: seth.gately@swca.com	

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): Chris Danauskas	Title: Site Director
X Signature (Blue Ink):	Date:

Attach Additional Sheets As Necessary

Page 1 of 2

FORMs A2, A3
EMISSION SOURCE LISTING FOR THIS APPLICATION - A2
112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16		NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate		A2
EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted				
EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION	
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)				
ES-029	ROM Truck Unloading Area	N/A		
Primary Crushing Operations				
ES-028a	Apron Feeder Conveyor	CD-028	Primary Crusher Baghouse	
ES-028b	Vibrating Grizzly	CD-028	Primary Crusher Baghouse	
ES-028c	Primary Jaw Crusher	CD-028	Primary Crusher Baghouse	
ES-028d	Sacrificial Conveyor	CD-028	Primary Crusher Baghouse	
Secondary Crushing Operations				
ES-027	Scalping Screen Feed Conveyor #1	CD-023	Secondary Crusher Baghouse	
ES-026	Scalping Screen Feed Conveyor #2	CD-023	Secondary Crusher Baghouse	
ES-023a	Scalping Screen Feed Conveyor #3	CD-023	Secondary Crusher Baghouse	
ES-023b	Scalping Screen	CD-023	Secondary Crusher Baghouse	
ES-023c	Secondary Crusher Feed Bin	CD-023	Secondary Crusher Baghouse	
ES-023d	Secondary Crusher Belt Feeder	CD-023	Secondary Crusher Baghouse	
ES-023e	Secondary Cone Crusher	CD-023	Secondary Crusher Baghouse	
ES-023f	Sorting Screen Feed Conveyor #1	CD-023	Secondary Crusher Baghouse	
ES-023g	Sorting Screen Feed Conveyor #2	CD-023	Secondary Crusher Baghouse	
Ore Sorting Operations				
ES-020a	Sorting Sizing Screen	CD-020	Sorter Sizing Screen Baghouse	
ES-020b	Coarse Sorting Conveyor	CD-020	Sorter Sizing Screen Baghouse	
ES-020c	Fine Sorting Conveyor	CD-020	Sorter Sizing Screen Baghouse	
ES-017a	Sorting Bypass Conveyor #1	CD-018	Sorter Bypass Conveyor Baghouse	
ES-017b	Sorting Bypass Conveyor #2	CD-018	Sorter Bypass Conveyor Baghouse	
ES-018a	Coarse Sorter Bin	CD-018	Sorter Bypass Conveyor Baghouse	
ES-018b	Belt Feeder - Coarse Sorter #1/#2	CD-018	Sorter Bypass Conveyor Baghouse	
ES-018c	Fine Sorter Bin	CD-018	Sorter Bypass Conveyor Baghouse	
ES-018d	Belt Feeder - Fine Sorter #1/#2	CD-018	Sorter Bypass Conveyor Baghouse	
ES-016a	Coarse Sorter #1/#2	CD-016	Ore Sorting Baghouse	
ES-016b	Fine Sorter #1/#2	CD-016	Ore Sorting Baghouse	
ES-019	Tertiary Crushing Feed Conveyor	CD-016	Ore Sorting Baghouse	
ES-030	Sorter Rejects Conveyor	CD-016	Ore Sorting Baghouse	
Tertiary Crushing Operations				
ES-022a&b	Tertiary Crusher Sizing Screen #1/#2	CD-022	Tertiary Sizing Screen Baghouse	
ES-022c	Tertiary Crushing Feed Bin Conveyor	CD-022	Tertiary Sizing Screen Baghouse	
ES-031	Stockpile Feed Conveyor #1	CD-022	Tertiary Sizing Screen Baghouse	
ES-021a	Tertiary Crusher Feed Bin	CD-021	Tertiary Crusher Baghouse	
ES-021b&c	Belt Feeder - Tertiary Crusher #1/#2	CD-021	Tertiary Crusher Baghouse	
ES-021d&e	Tertiary Cone Crusher #1/#2	CD-021	Tertiary Crusher Baghouse	
ES-021f	Tertiary Crusher Product Conveyor	CD-021	Tertiary Crusher Baghouse	
ES-035	Stockpile Feed Conveyor #2	CD-040	Stockpile Sizing Screen Baghouse	
ES-040a	Stockpile Stacking Conveyor	CD-040	Stockpile Sizing Screen Baghouse	
ES-040b	Plant Feed Stockpile	CD-040	Stockpile Sizing Screen Baghouse	
ES-040c&d	Plant Feed Belt Feeder #1/#2	CD-040	Stockpile Sizing Screen Baghouse	
ES-040e	Stockpile Discharge Conveyor	CD-040	Stockpile Sizing Screen Baghouse	
ES-040f	DMS Feed Conveyor	CD-040	Stockpile Sizing Screen Baghouse	
Concentrator Operations				
ES-039a	DMS Feed Bin	CD-039	DMS Dryer Baghouse	
ES-039b	Belt Feeder - DMS #1	CD-039	DMS Dryer Baghouse	
ES-039c	Belt Feeder - DMS #2	CD-039	DMS Dryer Baghouse	
ES-039d	DMS Dryer	CD-039	DMS Dryer Baghouse	
ES-042	Dryer Discharge Conveyor #1	CD-043	DMS and Mag Seg Baghouse	
ES-047	Dryer Discharge Conveyor #2	CD-043	DMS and Mag Seg Baghouse	
ES-032	Dryer Discharge Conveyor #3	CD-043	DMS and Mag Seg Baghouse	
ES-043a	Dryer Discharge Conveyor #4	CD-043	DMS and Mag Seg Baghouse	
ES-043b	Magnetic Feed Bin	CD-043	DMS and Mag Seg Baghouse	
ES-043c	LIMS Vibrating Feeder #1/#2	CD-043	DMS and Mag Seg Baghouse	
ES-043d	LIMS Coarse Drums #1/#2	CD-043	DMS and Mag Seg Baghouse	
ES-043e	Coarse High Intensity Magnetic Separators	CD-043	DMS and Mag Seg Baghouse	
ES-043f	Coarse Magnetics Conveyor	CD-043	DMS and Mag Seg Baghouse	
ES-043g	Coarse Concentrate Conveyor #1	CD-043	DMS and Mag Seg Baghouse	
ES-024	Sorter Rejects Bin	CD-024	Sorter Rejects Bin Vent Filter	
ES-025	DMS Rejects Bin (Coarse Tails Bin)	CD-025	DMS Reject Bin Vent Filter	
ES-013	Concentrate Load Out Bin	CD-013	Concentrate Load Out Bin Vent Filter	
ES-012	Concentrate Load Out Bin	CD-012	Concentrate Load Out Bin Vent Filter	
ES-011	Concentrate Truck Load Out Belt Feeder	N/A		
ES-015	Truck Load Out Stacker Conveyor	N/A		
ES-010	Rail Load Out Conveyor #1	N/A		
ES-009	Rail Load Out Conveyor #2	N/A		
ES-008	Rail Load Out Conveyor #3	N/A		
ES-007	Rail Load Out Conveyor #4	N/A		
ES-005	Rail Load Out Station Feed Bin	CD-005	Rail Load Out Bin Vent Filter	
ES-051	Methyl Isobutyl Carbinol Usage	N/A		
Existing Permitted Equipment To Be MODIFIED By This Application				
Equipment To Be DELETED By This Application				

112(r) APPLICABILITY INFORMATION				A3
Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☐ Yes ☒ No				
If No, please specify in detail how your facility avoided applicability: The facility does not store any regulated chemicals in applicable quantities.				
If your facility is Subject to 112(r), please complete the following:				
A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150? ☐ Yes ☐ No Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____				
B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard? ☐ Yes ☐ No If yes, please specify: _____				
C. List the processes subject to 112(r) at your facility:				
PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)	

Attach Additional Sheets As Necessary

Emission Source B and C Forms

Primary Crushing Operations

ES-029

ES-028a - ES-028d

CD-028

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: ROM Truck Unloading Area	EMISSION SOURCE ID NO: ES-029
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-029	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Truck unloading area. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.6889	2.0127	0.6889	3.0176	0.6889	3.0176
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.3259	0.9520	0.3259	1.4272	0.3259	1.4272
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0493	0.1442	0.0493	0.2161	0.0493	0.2161
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: ROM Truck Unloading Area	EMISSION SOURCE ID NO: ES-029
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-029	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Truck unloading area. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Apron Feeder Conveyor	EMISSION SOURCE ID NO: ES-028a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-028
EMISSION POINT (STACK) ID NO(S): EP-028	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Primary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

[illegible]

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Vibrating Grizzly	EMISSION SOURCE ID NO: ES-028b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-028
EMISSION POINT (STACK) ID NO(S): EP-028	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Primary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Vibrating Grizzly	EMISSION SOURCE ID NO: ES-028b
	CONTROL DEVICE ID NO(S): CD-028
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-028

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Primary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Primary Jaw Crusher	EMISSION SOURCE ID NO: ES-028c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-028
EMISSION POINT (STACK) ID NO(S): EP-028	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Primary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0175	0.0512	0.3504	1.5348	0.0175	0.0767
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0079	0.0230	0.1577	0.6906	0.0079	0.0345
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0012	0.0035	0.0237	0.1036	0.0012	0.0052
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sacrificial Conveyor	EMISSION SOURCE ID NO: ES-028d
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-028
EMISSION POINT (STACK) ID NO(S): EP-028	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Primary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Sacrificial Conveyor	EMISSION SOURCE ID NO: ES-028d
	CONTROL DEVICE ID NO(S): CD-028
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-028

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Primary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO: CD-028	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-028a through ES-028d Primary Crusher Building
EMISSION POINT (STACK) ID NO(S): EP-028	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO

DESCRIBE CONTROL SYSTEM:

Schust 3 module, size 1715, Model 168, Pulse Jet Dust Collector in a single configuration.
A solid state timer provides sequential pulsing of the air valves.
See control device PFD on the next page.

POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}	
BEFORE CONTROL EMISSION RATE (LB/HR):	0.58	0.23	0.04	
CAPTURE EFFICIENCY:	95 %	95 %	95 %	%
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %	%
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %	%
EFFICIENCY DETERMINATION CODE:	1	1	1	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.006	0.002	0.0003	

PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20 GAUGE? ☒ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT ³): 90	INLET TEMPERATURE (°F): MIN 0 MAX 115	
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³	OUTLET TEMPERATURE (°F) MIN 0 MAX 115	
INLET AIR FLOW RATE (ACFM): 104,000	FILTER OPERATING TEMP (°F): Ambient	
NO. OF COMPARTMENTS: 3	NO. OF BAGS PER COMPARTMENT: 255	LENGTH OF BAG (IN.): 168
NO. OF CARTRIDGES: 765	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22	DIAMETER OF BAG (IN.): 6
TOTAL FILTER SURFACE AREA (FT ²): 16,830	AIR TO CLOTH RATIO: 6.2	
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☒ FELTED	

DESCRIBE CLEANING PROCEDURES:

- ☒ AIR PULSE
- ☐ SONIC
- ☐ REVERSE FLOW
- ☐ SIMPLE BAG COLLAPSE
- ☐ MECHANICAL/SHAKER
- ☐ RING BAG COLLAPSE
- ☐ OTHER:

DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.

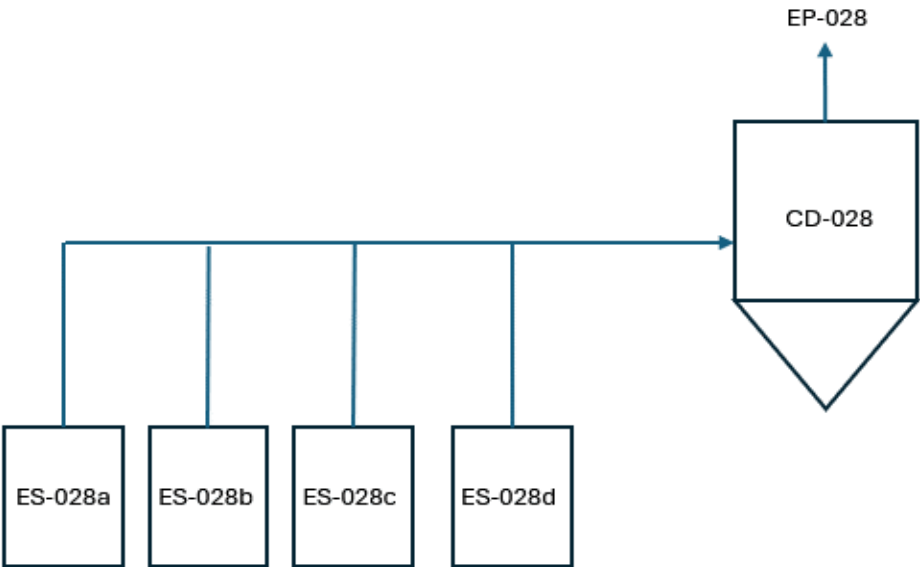
PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	0	0
1-10	58	58
10-25	42	100
25-50	0	100
50-100	0	100
>100	0	100
TOTAL = 100		

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Primary Crusher Baghouse (CD-028)



Secondary Crushing Operations

ES-023a - ES-023g

ES-026 and ES-027

CD-023

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Scalping Screen Feed Conveyor #1	EMISSION SOURCE ID NO: ES-027
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Scalping screen feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

SEE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-027

CONTROL DEVICE ID NO(S): CD-023

EMISSION POINT (STACK) ID NO(S): EP-023

Scalping screen feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Scalping Screen Feed Conveyor #2	EMISSION SOURCE ID NO: ES-026
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Scalping screen feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION:

Scalping Screen Feed Conveyor #2

EMISSION SOURCE ID NO: ES-026

CONTROL DEVICE ID NO(S): CD-023

OPERATING SCENARIO: 1 OF 1

EMISSION POINT (STACK) ID NO(S): EP-023

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Scalping screen feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):

REQUESTED LIMITATION (BATCHES / HOUR):

(BATCHES/YR):

FUEL USED: N/A

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

MAX. CAPACITY HOURLY FUEL USE: N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Scalping Screen Feed Conveyor #3	EMISSION SOURCE ID NO: ES-023a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO: ES-023a	
Scalping Screen Feed Conveyor #3		CONTROL DEVICE ID NO(S): CD-023	
OPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID NO(S): EP-023	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.			
MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		
MAXIMUM DESIGN (BATCHES / HOUR):			
REQUESTED LIMITATION (BATCHES / HOUR):		(BATCHES/YR):	
FUEL USED: N/A		TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		REQUESTED CAPACITY ANNUAL FUEL USE: N/A	
COMMENTS:			

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Scalping Screen	EMISSION SOURCE ID NO: ES-023b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0612	0.1787	1.2232	5.3576	0.0612	0.2679
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0206	0.0601	0.4114	1.8021	0.0206	0.0901
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0031	0.0090	0.0617	0.2703	0.0031	0.0135
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-023b

CONTROL DEVICE ID NO(S): CD-023

EMISSION POINT (STACK) ID NO(S): EP-023

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Secondary Crusher Feed Bin	EMISSION SOURCE ID NO: ES-023c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): 000 ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0248	0.0724	0.4956	2.1709	0.0248	0.1085
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0117	0.0342	0.2344	1.0268	0.0117	0.0513
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0018	0.0052	0.0355	0.1555	0.0018	0.0078
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-023c			
Secondary Crusher Feed Bin				CONTROL DEVICE ID NO(S): CD-023			
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-023			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Ore from the primary crusher is conveyed to the feed bin which is controlled with dust pickups. See PFD Figure 3 in Section 3.							
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 156			
CAPACITY		CUBIC FEET: 1,000		TONS: 75			
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 20	WIDTH: 20	HEIGHT: 30
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 2,337,168		MAXIMUM DESIGN CAPACITY: 3,504,000			
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM		
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units		
NO. FILL TUBES:							
MAXIMUM ACFM:							
MATERIAL IS UNLOADED TO: Secondary crusher							
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Conveyor							
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 400							
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 400							
COMMENTS:							

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Secondary Crusher Belt Feeder	EMISSION SOURCE ID NO: ES-023d
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0028	0.0082	0.0560	0.2453	0.0028	0.0123
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0009	0.0027	0.0184	0.0806	0.0009	0.0040
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0004	0.0028	0.0121	0.0001	0.0006
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Secondary Crusher Belt Feeder	EMISSION SOURCE ID NO: ES-023d
	CONTROL DEVICE ID NO(S): CD-023
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-023

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	400	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Secondary Cone Crusher	EMISSION SOURCE ID NO: ES-023e
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0240	0.0701	0.4800	2.1024	0.0240	0.1051
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0108	0.0316	0.2160	0.9461	0.0108	0.0473
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0016	0.0047	0.0324	0.1419	0.0016	0.0071
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

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EMISSION SOURCE DESCRIPTION: Secondary Cone Crusher		EMISSION SOURCE ID NO: ES-023e	
OPERATING SCENARIO: 1 OF 1		CONTROL DEVICE ID NO(S): CD-023	
		EMISSION POINT (STACK) ID NO(S): EP-023	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.			
MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	400	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		
MAXIMUM DESIGN (BATCHES / HOUR):			
REQUESTED LIMITATION (BATCHES / HOUR):		(BATCHES/YR):	
FUEL USED: N/A		TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		REQUESTED CAPACITY ANNUAL FUEL USE: N/A	
COMMENTS:			

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sorting Screen Feed Conveyor #1	EMISSION SOURCE ID NO: ES-023f
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Sorting Screen Feed Conveyor #1	EMISSION SOURCE ID NO: ES-023f
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sorting Screen Feed Conveyor #2	EMISSION SOURCE ID NO: ES-023g
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0039	0.0114	0.0778	0.3409	0.0039	0.0170
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0037	0.0256	0.1120	0.0013	0.0056
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0038	0.0168	0.0002	0.0008
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Sorting Screen Feed Conveyor #2	EMISSION SOURCE ID NO: ES-023g
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-023
EMISSION POINT (STACK) ID NO(S): EP-023	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Secondary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

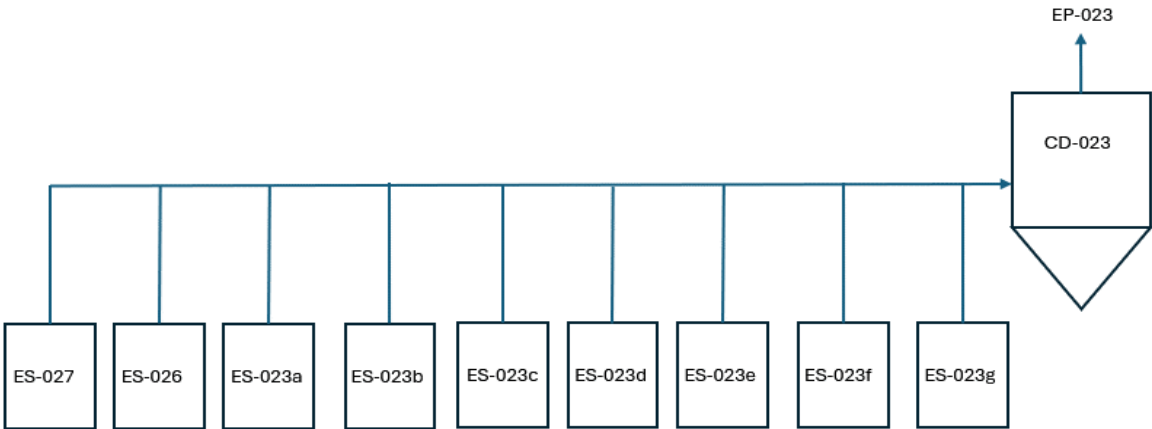
MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

REVISED 09/22/16		NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate							C1																			
CONTROL DEVICE ID NO:		CD-023		CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-023a through ES-023g Secondary Crusher Building, ES-026, ES-027																								
EMISSION POINT (STACK) ID NO(S): EP-023		POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS																										
OPERATING SCENARIO: 1 OF 1				P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO																								
DESCRIBE CONTROL SYSTEM: Schust 1 module, size 1715, Model 168, Pulse Jet Dust Collector in a single configuration. A solid state timer provides sequential pulsing of the air valves. See control device PFD on the next page.																												
POLLUTANTS COLLECTED:		PM		PM ₁₀		PM _{2.5}																						
BEFORE CONTROL EMISSION RATE (LB/HR):		2.64		1.01		0.15																						
CAPTURE EFFICIENCY:		95 %		95 %		95 %		%																				
CONTROL DEVICE EFFICIENCY:		99 %		99 %		99 %		%																				
CORRESPONDING OVERALL EFFICIENCY:		94.05 %		94.05 %		94.05 %		%																				
EFFICIENCY DETERMINATION CODE:		1		1		1																						
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):		0.025		0.010		0.0014																						
PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20 GAUGE?		☒ YES ☐ NO																										
BULK PARTICLE DENSITY (LB/FT ³): 90		INLET TEMPERATURE (°F): MIN 0 MAX 115																										
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³		OUTLET TEMPERATURE (°F) MIN 0 MAX 115																										
INLET AIR FLOW RATE (ACFM): 28,200		FILTER OPERATING TEMP (°F): Ambient																										
NO. OF COMPARTMENTS: 1		NO. OF BAGS PER COMPARTMENT: 255			LENGTH OF BAG (IN.): 168																							
NO. OF CARTRIDGES: 255		FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22			DIAMETER OF BAG (IN.): 6																							
TOTAL FILTER SURFACE AREA (FT ²): 5,610		AIR TO CLOTH RATIO: 5.03																										
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE		FILTER MATERIAL: ☐ WOVEN ☒ FELTED																										
DESCRIBE CLEANING PROCEDURES: ☒ AIR PULSE ☐ SONIC ☐ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE ☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE ☐ OTHER:				PARTICLE SIZE DISTRIBUTION																								
				<table><thead><tr><th>SIZE (MICRONS)</th><th>WEIGHT % OF TOTAL</th><th>CUMULATIVE %</th></tr></thead><tbody><tr><td>0-1</td><td>0</td><td>0</td></tr><tr><td>1-10</td><td>58</td><td>58</td></tr><tr><td>10-25</td><td>42</td><td>100</td></tr><tr><td>25-50</td><td>0</td><td>100</td></tr><tr><td>50-100</td><td>0</td><td>100</td></tr><tr><td>>100</td><td>0</td><td>100</td></tr><tr><td colspan="3">TOTAL = 100</td></tr></tbody></table>					SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %	0-1	0	0	1-10	58	58	10-25	42	100	25-50	0	100	50-100	0	100	>100	0
SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %																										
0-1	0	0																										
1-10	58	58																										
10-25	42	100																										
25-50	0	100																										
50-100	0	100																										
>100	0	100																										
TOTAL = 100																												
DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.																												
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):																												
COMMENTS:																												

Secondary Crusher Baghouse (CD-023)



Sorting Operations

ES-020a - ES-020c

CD-020

ES-017a/b and ES-018a/b/c/d

CD-018

ES-016a and ES-016b

ES-019 and ES-030

CD-016

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sorting Sizing Screen	EMISSION SOURCE ID NO: ES-020a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-020
EMISSION POINT (STACK) ID NO(S): EP-020	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Sorter sizing screen with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0612	0.1787	1.2232	5.3576	0.0612	0.2679
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0206	0.0601	0.4114	1.8021	0.0206	0.0901
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0031	0.0090	0.0617	0.2703	0.0031	0.0135
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

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EMISSION SOURCE DESCRIPTION: Sorting Sizing Screen		EMISSION SOURCE ID NO: ES-020a	
		CONTROL DEVICE ID NO(S): CD-020	
OPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID NO(S): EP-020	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Sorter sizing screen with dust pickups. See PFD Figure 3 in Section 3.			
MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	556	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		
MAXIMUM DESIGN (BATCHES / HOUR):			
REQUESTED LIMITATION (BATCHES / HOUR):		(BATCHES/YR):	
FUEL USED: N/A		TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		REQUESTED CAPACITY ANNUAL FUEL USE: N/A	
COMMENTS:			

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Coarse Sorting Conveyor	EMISSION SOURCE ID NO: ES-020b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-020
EMISSION POINT (STACK) ID NO(S): EP-020	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Sorter sizing screen with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0024	0.0069	0.0473	0.2073	0.0024	0.0104
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0008	0.0023	0.0155	0.0681	0.0008	0.0034
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0003	0.0023	0.0102	0.0001	0.0005
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Coarse Sorting Conveyor	EMISSION SOURCE ID NO: ES-020b
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-020
EMISSION POINT (STACK) ID NO(S): EP-020	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Sorter sizing screen with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	338	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Fine Sorting Conveyor	EMISSION SOURCE ID NO: ES-020c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-020
EMISSION POINT (STACK) ID NO(S): EP-020	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Sorter sizing screen with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0010	0.0029	0.0202	0.0883	0.0010	0.0044
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0003	0.0010	0.0066	0.0290	0.0003	0.0015
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0001	0.0010	0.0044	0.0000	0.0002
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Fine Sorting Conveyor	EMISSION SOURCE ID NO: ES-020c
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-020
EMISSION POINT (STACK) ID NO(S): EP-020	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Sorter sizing screen with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	144	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

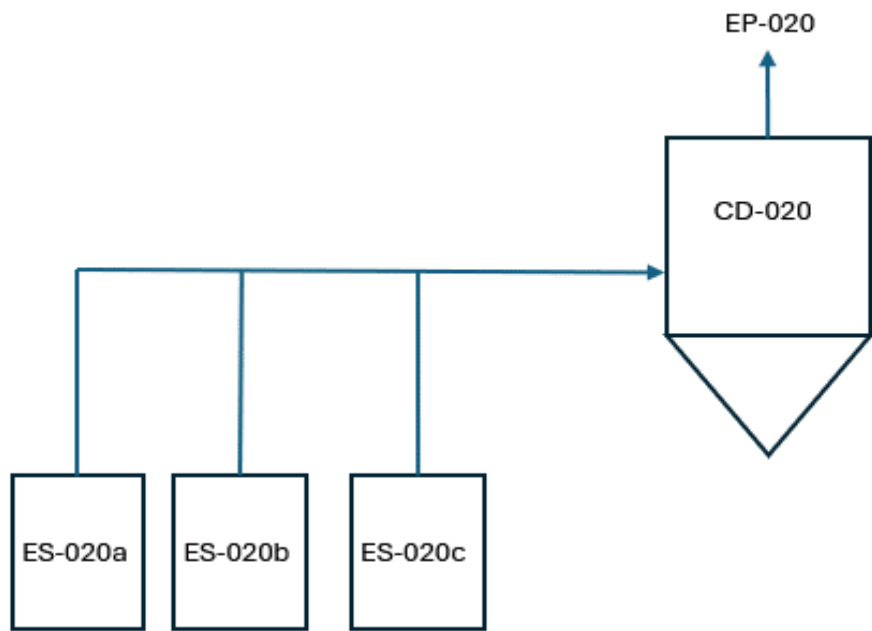
REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO: CD-020		CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-020a/b/c Sorter Sizing Screens and Conveyors																																				
EMISSION POINT (STACK) ID NO(S): EP-020		POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS																																				
OPERATING SCENARIO:																																						
1 OF 1		P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO																																				
DESCRIBE CONTROL SYSTEM: Schust 1 module, size 1315, Model 168, Pulse Jet Dust Collector in a single configuration. A solid state timer provides sequential pulsing of the air valves. See control device PFD on the next page.																																						
<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 40%;">POLLUTANTS COLLECTED:</td><td style="width: 15%;">PM</td><td style="width: 15%;">PM₁₀</td><td style="width: 15%;">PM_{2.5}</td><td style="width: 15%;"></td></tr><tr><td>BEFORE CONTROL EMISSION RATE (LB/HR):</td><td>1.29</td><td>0.43</td><td>0.07</td><td></td></tr><tr><td>CAPTURE EFFICIENCY:</td><td>95 %</td><td>95 %</td><td>95 %</td><td></td></tr><tr><td>CONTROL DEVICE EFFICIENCY:</td><td>99 %</td><td>99 %</td><td>99 %</td><td></td></tr><tr><td>CORRESPONDING OVERALL EFFICIENCY:</td><td>94.05 %</td><td>94.05 %</td><td>94.05 %</td><td></td></tr><tr><td>EFFICIENCY DETERMINATION CODE:</td><td>1</td><td>1</td><td>1</td><td></td></tr><tr><td>TOTAL AFTER CONTROL EMISSION RATE (LB/HR):</td><td>0.012</td><td>0.004</td><td>0.0006</td><td></td></tr></table>				POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}		BEFORE CONTROL EMISSION RATE (LB/HR):	1.29	0.43	0.07		CAPTURE EFFICIENCY:	95 %	95 %	95 %		CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %		CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %		EFFICIENCY DETERMINATION CODE:	1	1	1		TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.012	0.004	0.0006	
POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}																																			
BEFORE CONTROL EMISSION RATE (LB/HR):	1.29	0.43	0.07																																			
CAPTURE EFFICIENCY:	95 %	95 %	95 %																																			
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %																																			
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %																																			
EFFICIENCY DETERMINATION CODE:	1	1	1																																			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.012	0.004	0.0006																																			
PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20 GAUGE? ☒ YES ☐ NO																																						
BULK PARTICLE DENSITY (LB/FT ³): 90		INLET TEMPERATURE (°F): MIN 0 MAX 115																																				
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³		OUTLET TEMPERATURE (°F) MIN 0 MAX 115																																				
INLET AIR FLOW RATE (ACFM): 22,300		FILTER OPERATING TEMP (°F): Ambient																																				
NO. OF COMPARTMENTS: 1	NO. OF BAGS PER COMPARTMENT: 195		LENGTH OF BAG (IN.): 168																																			
NO. OF CARTRIDGES: 195	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22		DIAMETER OF BAG (IN.): 6																																			
TOTAL FILTER SURFACE AREA (FT ²): 4,290		AIR TO CLOTH RATIO: 5.2																																				
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE		FILTER MATERIAL: ☐ WOVEN ☒ FELTED																																				
DESCRIBE CLEANING PROCEDURES: ☒ AIR PULSE ☐ SONIC ☐ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE ☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE ☐ OTHER:		PARTICLE SIZE DISTRIBUTION																																				
		<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th>SIZE (MICRONS)</th><th>WEIGHT % OF TOTAL</th><th>CUMULATIVE %</th></tr></thead><tbody><tr><td>0-1</td><td>0</td><td>0</td></tr><tr><td>1-10</td><td>58</td><td>58</td></tr><tr><td>10-25</td><td>42</td><td>100</td></tr><tr><td>25-50</td><td>0</td><td>100</td></tr><tr><td>50-100</td><td>0</td><td>100</td></tr><tr><td>>100</td><td>0</td><td>100</td></tr><tr><td colspan="3" style="text-align: center;">TOTAL = 100</td></tr></tbody></table>		SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %	0-1	0	0	1-10	58	58	10-25	42	100	25-50	0	100	50-100	0	100	>100	0	100	TOTAL = 100													
SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %																																				
0-1	0	0																																				
1-10	58	58																																				
10-25	42	100																																				
25-50	0	100																																				
50-100	0	100																																				
>100	0	100																																				
TOTAL = 100																																						
DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.																																						
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):																																						
COMMENTS:																																						

Sorter Sizing Screen Baghouse (CD-020)



FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sorting Bypass Conveyor #1	EMISSION SOURCE ID NO: ES-017a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-018
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0005	0.0015	0.0101	0.0442	0.0005	0.0022
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0002	0.0005	0.0033	0.0145	0.0002	0.0007
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0001	0.0005	0.0022	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Sorting Bypass Conveyor #1	EMISSION SOURCE ID NO: ES-017a
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-018
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	72	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sorting Bypass Conveyor #2	EMISSION SOURCE ID NO: ES-017b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-018
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0005	0.0015	0.0101	0.0442	0.0005	0.0022
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0002	0.0005	0.0033	0.0145	0.0002	0.0007
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0001	0.0005	0.0022	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Sorting Bypass Conveyor #2	EMISSION SOURCE ID NO: ES-017b
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-018
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	72	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Coarse Sorter Bin	EMISSION SOURCE ID NO: ES-018a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0209	0.0612	0.4188	1.8344	0.0209	0.0917
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0099	0.0289	0.1981	0.8676	0.0099	0.0434
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0015	0.0044	0.0300	0.1314	0.0015	0.0066
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-018a	
Coarse Sorter Bin				CONTROL DEVICE ID NO(S): CD-016	
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-018	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Ore from the sizing screen is conveyed to the feed bin which is controlled with dust pickups. See PFD Figure 3 in Section 3.					
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 156	
CAPACITY		CUBIC FEET: 1,000		TONS: 75	
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 20 WIDTH: 20 HEIGHT: 30
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 1,974,907		MAXIMUM DESIGN CAPACITY: 2,960,880	
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units
NO. FILL TUBES:					
MAXIMUM ACFM:					
MATERIAL IS UNLOADED TO: Coarse Sorter					
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Conveyor					
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 338					
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 338					
COMMENTS:					

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Belt Feeder - Coarse Sorter #1/#2	EMISSION SOURCE ID NO: ES-018b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0024	0.0069	0.0473	0.2073	0.0024	0.0104
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0008	0.0023	0.0155	0.0681	0.0008	0.0034
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0003	0.0023	0.0102	0.0001	0.0005
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Belt Feeder - Coarse Sorter #1/#2	EMISSION SOURCE ID NO: ES-018b
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Spodumene Concentrate	tons	338	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Fine Sorter Bin	EMISSION SOURCE ID NO: ES-018c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0089	0.0261	0.1784	0.7815	0.0089	0.0391
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0042	0.0123	0.0844	0.3696	0.0042	0.0185
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0006	0.0019	0.0128	0.0560	0.0006	0.0028
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-018c			
Fine Sorter Bin				CONTROL DEVICE ID NO(S): CD-016			
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-018			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Ore from the sizing screen is conveyed to the feed bin which is controlled with dust pickups. See PFD Figure 3 in Section 3.							
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 156			
CAPACITY		CUBIC FEET: 1,000		TONS: 75			
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 20	WIDTH: 20	HEIGHT: 30
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 841,380		MAXIMUM DESIGN CAPACITY: 1,261,440			
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM		
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units		
NO. FILL TUBES:							
MAXIMUM ACFM:							
MATERIAL IS UNLOADED TO: Fine Sorter							
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Conveyor							
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 144							
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 144							
COMMENTS:							

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Belt Feeder - Fine Sorter #1/#2	EMISSION SOURCE ID NO: ES-018d
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0010	0.0029	0.0202	0.0883	0.0010	0.0044
PARTICULATE MATTER <10 MICRONS (PM ₁₀)	AP-42	0.0003	0.0010	0.0066	0.0290	0.0003	0.0015
PARTICULATE MATTER <2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0001	0.0010	0.0044	0.0000	0.0002
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Belt Feeder - Fine Sorter #1/#2	EMISSION SOURCE ID NO: ES-018d
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-018	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Spodumene Concentrate	tons	144	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO:	CD-018	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):	ES-017a/b & ES-018a/b/c/d
EMISSION POINT (STACK) ID NO(S):	EP-018	POSITION IN SERIES OF CONTROLS	NO. 1 OF 1 UNITS
OPERATING SCENARIO:			
1 OF 1		P.E. SEAL REQUIRED (PER 2q .0112)?	☒ YES ☐ NO

DESCRIBE CONTROL SYSTEM:

Schust 1 module, size 0915, Model 168, Pulse Jet Dust Collector in a single configuration.
A solid state timer provides sequential pulsing of the air valves.
See control device PFD on the next page.

POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}	
BEFORE CONTROL EMISSION RATE (LB/HR):	0.68	0.31	0.05	
CAPTURE EFFICIENCY:	95 %	95 %	95 %	%
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %	%
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %	%
EFFICIENCY DETERMINATION CODE:	1	1	1	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.0065	0.0030	0.00045	

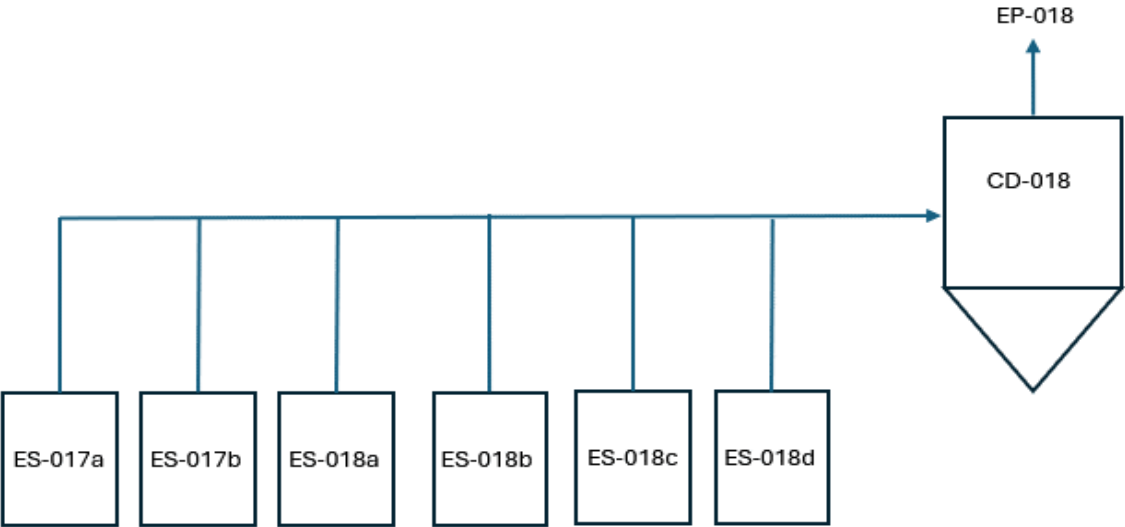
PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20		GAUGE?	☒ YES ☐ NO
BULK PARTICLE DENSITY (LB/FT ³): 90		INLET TEMPERATURE (°F): MIN 0 MAX 115	
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³		OUTLET TEMPERATURE (°F) MIN 0 MAX 115	
INLET AIR FLOW RATE (ACFM): 16,900		FILTER OPERATING TEMP (°F): Ambient	
NO. OF COMPARTMENTS: 1	NO. OF BAGS PER COMPARTMENT: 135	LENGTH OF BAG (IN.): 168	
NO. OF CARTRIDGES: 135	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22	DIAMETER OF BAG (IN.): 6	
TOTAL FILTER SURFACE AREA (FT ²): 2,970		AIR TO CLOTH RATIO: 5.69	
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE		FILTER MATERIAL: ☐ WOVEN ☒ FELTED	

DESCRIBE CLEANING PROCEDURES: ☒ AIR PULSE ☐ REVERSE FLOW ☐ MECHANICAL/SHAKER ☐ OTHER: ☐ SONIC ☐ SIMPLE BAG COLLAPSE ☐ RING BAG COLLAPSE	PARTICLE SIZE DISTRIBUTION		
	SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.	0-1	0	0
	1-10	58	58
	10-25	42	100
	25-50	0	100
	50-100	0	100
	>100	0	100
TOTAL = 100			

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Sorter Bypass Converor Baghouse (CD-018)



FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Coarse Sorter #1/#2	EMISSION SOURCE ID NO: ES-016a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-016	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0280	0.0819	0.5608	2.4562	0.0280	0.1228
PARTICULATE MATTER <10 MICRONS (PM ₁₀)	AP-42	0.0122	0.0357	0.2447	1.0719	0.0122	0.0536
PARTICULATE MATTER <2.5 MICRONS (PM _{2.5})	AP-42	0.0018	0.0054	0.0370	0.1620	0.0018	0.0081
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Fine Sorter #1/#2	EMISSION SOURCE ID NO: ES-016b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-016	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0119	0.0349	0.2389	1.0464	0.0119	0.0523
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0052	0.0152	0.1043	0.4567	0.0052	0.0228
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0008	0.0023	0.0158	0.0690	0.0008	0.0035
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Fine Sorter #1/#2	EMISSION SOURCE ID NO: ES-016b
	CONTROL DEVICE ID NO(S): CD-016
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-016

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Ore sorting operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Spodumene Concentrate	tons	144	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sorter Rejects Conveyor	EMISSION SOURCE ID NO: ES-030
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-016	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Sorter rejects conveyor with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0007	0.0026	0.0137	0.0601	0.0007	0.0030
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0002	0.0008	0.0045	0.0197	0.0002	0.0010
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0001	0.0007	0.0030	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-030

CONTROL DEVICE ID NO(S): CD-016

EMISSION POINT (STACK) ID NO(S): EP-016

Sorter rejects conveyor with dust pickups. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Tertiary Crushing Feed Conveyor	EMISSION SOURCE ID NO: ES-019
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-016
EMISSION POINT (STACK) ID NO(S): EP-016	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary crushing conveyor with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0029	0.0084	0.0578	0.2533	0.0029	0.0127
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0009	0.0028	0.0190	0.0832	0.0009	0.0042
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0004	0.0028	0.0125	0.0001	0.0006
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Tertiary Crushing Feed Conveyor	EMISSION SOURCE ID NO: ES-019
	CONTROL DEVICE ID NO(S): CD-016
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-016

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary crushing conveyor with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	413	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

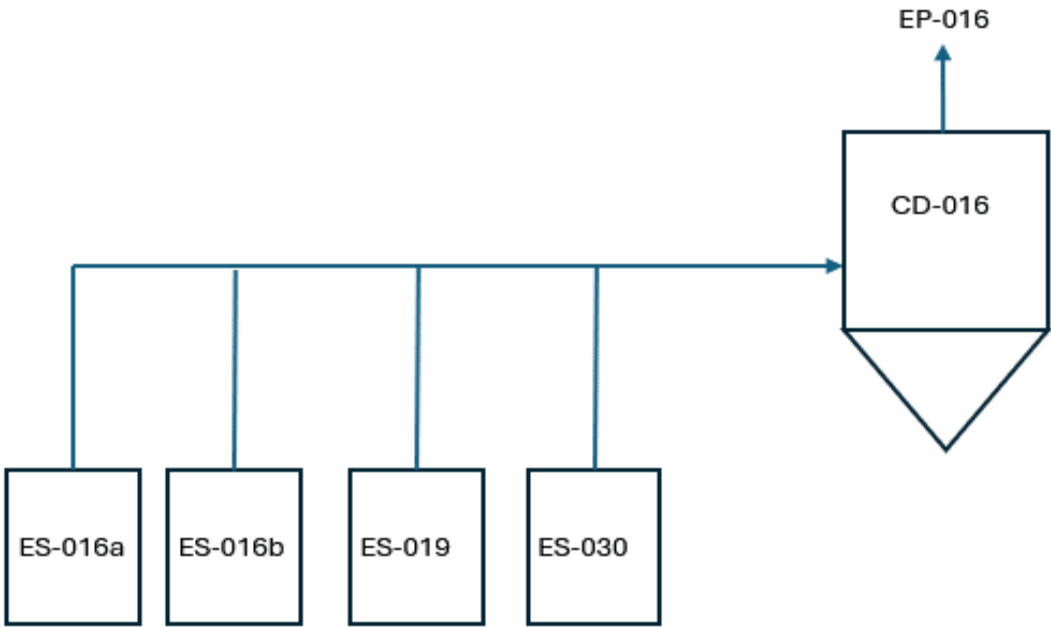
REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO: CD-016		CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-016a and ES-016b Ore Sorting Building & ES-019 & ES-030																																				
EMISSION POINT (STACK) ID NO(S): EP-016		POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS																																				
OPERATING SCENARIO:																																						
1 OF 1		P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO																																				
DESCRIBE CONTROL SYSTEM: Schust 2 module, size 1215, Model 168, Pulse Jet Dust Collector in a single configuration. A solid state timer provides sequential pulsing of the air valves. See control device PFD on the next page.																																						
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 35%;">POLLUTANTS COLLECTED:</td> <td style="width: 15%; text-align: center;">PM</td> <td style="width: 15%; text-align: center;">PM₁₀</td> <td style="width: 15%; text-align: center;">PM_{2.5}</td> <td style="width: 20%;"></td> </tr> <tr> <td>BEFORE CONTROL EMISSION RATE (LB/HR):</td> <td style="text-align: center;">0.87</td> <td style="text-align: center;">0.37</td> <td style="text-align: center;">0.06</td> <td></td> </tr> <tr> <td>CAPTURE EFFICIENCY:</td> <td style="text-align: center;">95 %</td> <td style="text-align: center;">95 %</td> <td style="text-align: center;">95 %</td> <td style="text-align: center;">%</td> </tr> <tr> <td>CONTROL DEVICE EFFICIENCY:</td> <td style="text-align: center;">99 %</td> <td style="text-align: center;">99 %</td> <td style="text-align: center;">99 %</td> <td style="text-align: center;">%</td> </tr> <tr> <td>CORRESPONDING OVERALL EFFICIENCY:</td> <td style="text-align: center;">94.05 %</td> <td style="text-align: center;">94.05 %</td> <td style="text-align: center;">94.05 %</td> <td style="text-align: center;">%</td> </tr> <tr> <td>EFFICIENCY DETERMINATION CODE:</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td></td> </tr> <tr> <td>TOTAL AFTER CONTROL EMISSION RATE (LB/HR):</td> <td style="text-align: center;">0.008</td> <td style="text-align: center;">0.004</td> <td style="text-align: center;">0.001</td> <td></td> </tr> </table>				POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}		BEFORE CONTROL EMISSION RATE (LB/HR):	0.87	0.37	0.06		CAPTURE EFFICIENCY:	95 %	95 %	95 %	%	CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %	%	CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %	%	EFFICIENCY DETERMINATION CODE:	1	1	1		TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.008	0.004	0.001	
POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}																																			
BEFORE CONTROL EMISSION RATE (LB/HR):	0.87	0.37	0.06																																			
CAPTURE EFFICIENCY:	95 %	95 %	95 %	%																																		
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %	%																																		
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %	%																																		
EFFICIENCY DETERMINATION CODE:	1	1	1																																			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.008	0.004	0.001																																			
PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20 GAUGE? ☒ YES ☐ NO																																						
BULK PARTICLE DENSITY (LB/FT ³): 90		INLET TEMPERATURE (°F): MIN 0 MAX 115																																				
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³		OUTLET TEMPERATURE (°F) MIN 0 MAX 115																																				
INLET AIR FLOW RATE (ACFM): 44,300		FILTER OPERATING TEMP (°F): Ambient																																				
NO. OF COMPARTMENTS: 2	NO. OF BAGS PER COMPARTMENT: 180		LENGTH OF BAG (IN.): 168																																			
NO. OF CARTRIDGES: 360	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22		DIAMETER OF BAG (IN.): 6																																			
TOTAL FILTER SURFACE AREA (FT ²): 7,920		AIR TO CLOTH RATIO: 5.59																																				
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE FILTER MATERIAL: ☐ WOVEN ☒ FELTED																																						
DESCRIBE CLEANING PROCEDURES:		PARTICLE SIZE DISTRIBUTION																																				
☒ AIR PULSE ☐ SONIC ☐ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE ☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE ☐ OTHER:		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">SIZE (MICRONS)</th> <th style="width: 15%;">WEIGHT % OF TOTAL</th> <th style="width: 70%;">CUMULATIVE %</th> </tr> </thead> <tbody> <tr> <td>0-1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td>1-10</td> <td style="text-align: center;">58</td> <td style="text-align: center;">58</td> </tr> <tr> <td>10-25</td> <td style="text-align: center;">42</td> <td style="text-align: center;">100</td> </tr> <tr> <td>25-50</td> <td style="text-align: center;">0</td> <td style="text-align: center;">100</td> </tr> <tr> <td>50-100</td> <td style="text-align: center;">0</td> <td style="text-align: center;">100</td> </tr> <tr> <td>>100</td> <td style="text-align: center;">0</td> <td style="text-align: center;">100</td> </tr> <tr> <td colspan="3" style="text-align: right;">TOTAL = 100</td> </tr> </tbody> </table>		SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %	0-1	0	0	1-10	58	58	10-25	42	100	25-50	0	100	50-100	0	100	>100	0	100	TOTAL = 100													
SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %																																				
0-1	0	0																																				
1-10	58	58																																				
10-25	42	100																																				
25-50	0	100																																				
50-100	0	100																																				
>100	0	100																																				
TOTAL = 100																																						
DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.																																						
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):																																						
COMMENTS:																																						

Ore Sorting Baghouse (CD-016)



Tertiary Crushing Operations

ES-022a, ES-022b, ES-022c

ES-031

CD-022

ES-021a - ES-021f

CD-021

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Tertiary Crusher Sizing Screens	EMISSION SOURCE ID NO: ES-022a&b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-022
EMISSION POINT (STACK) ID NO(S): EP-022	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary sizing screens with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.1412	0.4126	2.8248	12.3726	0.1412	0.6186
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0376	0.1099	0.7525	3.2960	0.0376	0.1648
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0057	0.0166	0.1140	0.4991	0.0057	0.0250
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Tertiary Crusher Sizing Screens	EMISSION SOURCE ID NO: ES-022a&b
	CONTROL DEVICE ID NO(S): CD-022
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-022

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary sizing screens with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	1284	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Tertiary Crushing Feed Bin Conveyor	EMISSION SOURCE ID NO: ES-022c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-022
EMISSION POINT (STACK) ID NO(S): EP-022	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0029	0.0084	0.0578	0.2533	0.0029	0.0127
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0009	0.0028	0.0190	0.0832	0.0009	0.0042
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0004	0.0028	0.0125	0.0001	0.0006
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Tertiary Crushing Feed Bin Conveyor	EMISSION SOURCE ID NO: ES-022c
	CONTROL DEVICE ID NO(S): CD-022
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-022

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	413	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO:	CD-022	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):	ES-022a/b/c Tertiary Crusher Sizing Screens & ES-031
EMISSION POINT (STACK) ID NO(S):	EP-022	POSITION IN SERIES OF CONTROLS	NO. 1 OF 1 UNITS

OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO

DESCRIBE CONTROL SYSTEM:

Schust 2 module, size 1015, Model 168, Pulse Jet Dust Collector in a single configuration.
A solid state timer provides sequential pulsing of the air valves.
See control device PFD on the next page.

POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}	
BEFORE CONTROL EMISSION RATE (LB/HR):	2.95	0.79	0.12	
CAPTURE EFFICIENCY:	95 %	95 %	95 %	%
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %	%
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %	%
EFFICIENCY DETERMINATION CODE:	1	1	1	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.028	0.008	0.001	

PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20	GAUGE?	☒ YES ☐ NO
BULK PARTICLE DENSITY (LB/FT ³): 90	INLET TEMPERATURE (°F): MIN 0 MAX 115	
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³	OUTLET TEMPERATURE (°F) MIN 0 MAX 115	
INLET AIR FLOW RATE (ACFM): 37,900	FILTER OPERATING TEMP (°F): Ambient	
NO. OF COMPARTMENTS: 2	NO. OF BAGS PER COMPARTMENT: 150	LENGTH OF BAG (IN.): 168
NO. OF CARTRIDGES: 300	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22	DIAMETER OF BAG (IN.): 6
TOTAL FILTER SURFACE AREA (FT ²): 6,600	AIR TO CLOTH RATIO: 5.74	
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☒ FELTED	

DESCRIBE CLEANING PROCEDURES:

- ☒ AIR PULSE
- ☐ SONIC
- ☐ REVERSE FLOW
- ☐ SIMPLE BAG COLLAPSE
- ☐ MECHANICAL/SHAKER
- ☐ RING BAG COLLAPSE
- ☐ OTHER:

DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.

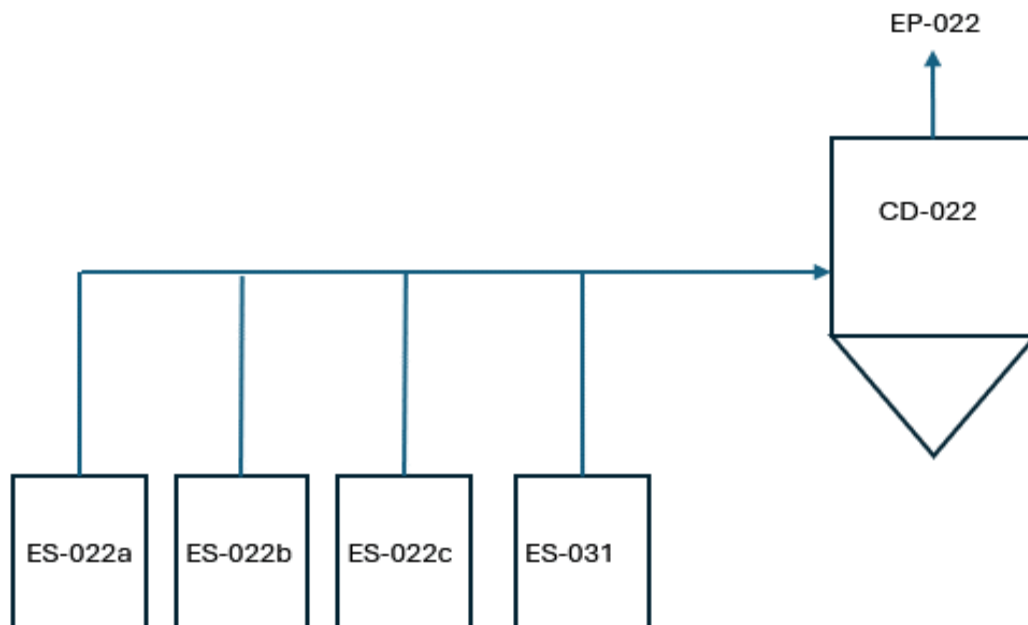
PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	0	0
1-10	58	58
10-25	42	100
25-50	0	100
50-100	0	100
>100	0	100
TOTAL = 100		

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Tertiary Sizing Screen Baghouse (CD-022)



FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Stockpile Feed Conveyor #1	EMISSION SOURCE ID NO: ES-031
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-022
EMISSION POINT (STACK) ID NO(S): EP-022	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant stockpile feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0032	0.0112	0.0641	0.2808	0.0032	0.0140
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0011	0.0037	0.0211	0.0923	0.0011	0.0046
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0032	0.0138	0.0002	0.0007
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Stockpile Feed Conveyor #1	EMISSION SOURCE ID NO: ES-031
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-022
EMISSION POINT (STACK) ID NO(S): EP-022	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Plant stockpile feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	458	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Tertiary Crusher Feed Bin	EMISSION SOURCE ID NO: ES-021a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-021
EMISSION POINT (STACK) ID NO(S): EP-021	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0256	0.0748	0.5118	2.2415	0.0256	0.1121
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0121	0.0354	0.2420	1.0602	0.0121	0.0530
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0018	0.0054	0.0367	0.1605	0.0018	0.0080
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-021a			
Tertiary Crusher Feed Bin				CONTROL DEVICE ID NO(S): CD-021			
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-021			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Ore from the sorting system is conveyed to the feed bin which is controlled with dust pickups. See PFD Figure 3 in Section 3.							
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 156			
CAPACITY		CUBIC FEET: 3,000		TONS: 220			
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 30	WIDTH: 30	HEIGHT: 30
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 2,413,126		MAXIMUM DESIGN CAPACITY: 3,617,880			
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM		
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units		
NO. FILL TUBES:							
MAXIMUM ACFM:							
MATERIAL IS UNLOADED TO: Tertiary crusher							
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Conveyor							
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 413							
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 413							
COMMENTS:							

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Belt Feeder - Tertiary Crusher #1/#2	EMISSION SOURCE ID NO: ES-021b&c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-021
EMISSION POINT (STACK) ID NO(S): EP-021	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

SEE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0029	0.0084	0.0578	0.2533	0.0029	0.0127
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0009	0.0028	0.0190	0.0832	0.0009	0.0042
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0004	0.0028	0.0125	0.0001	0.0006
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Belt Feeder - Tertiary Crusher #1/#2	EMISSION SOURCE ID NO: ES-021b&c
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-021
EMISSION POINT (STACK) ID NO(S): EP-021	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	413	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Tertiary Cone Crusher #1/#2	EMISSION SOURCE ID NO: ES-021d&e
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-021
EMISSION POINT (STACK) ID NO(S): EP-021	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): 000 ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0248	0.0724	0.4956	2.1707	0.0248	0.1085
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0112	0.0326	0.2230	0.9768	0.0112	0.0488
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0017	0.0049	0.0335	0.1465	0.0017	0.0073
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Tertiary Cone Crusher #1/#2		EMISSION SOURCE ID NO: ES-021d&e	
OPERATING SCENARIO: 1 OF 1		CONTROL DEVICE ID NO(S): CD-021	
EMISSION POINT (STACK) ID NO(S): EP-021			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.			
MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	413	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		
MAXIMUM DESIGN (BATCHES / HOUR):			
REQUESTED LIMITATION (BATCHES / HOUR):		(BATCHES/YR):	
FUEL USED: N/A		TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		REQUESTED CAPACITY ANNUAL FUEL USE: N/A	
COMMENTS:			

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Tertiary Crusher Product Conveyor	EMISSION SOURCE ID NO: ES-021f
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-021
EMISSION POINT (STACK) ID NO(S): EP-021	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0029	0.0084	0.0578	0.2533	0.0029	0.0127
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0009	0.0028	0.0190	0.0832	0.0009	0.0042
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0004	0.0028	0.0125	0.0001	0.0006
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Tertiary Crusher Product Conveyor	EMISSION SOURCE ID NO: ES-021f
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-021
EMISSION POINT (STACK) ID NO(S): EP-021	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Tertiary crushing operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	413	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO:	CD-021	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):	ES-021a through ES-021f Tertiary Crusher Building
EMISSION POINT (STACK) ID NO(S):	EP-021	POSITION IN SERIES OF CONTROLS	NO. 1 OF 1 UNITS
OPERATING SCENARIO:			
1 OF 1		P.E. SEAL REQUIRED (PER 2q .0112)?	☒ YES ☐ NO

DESCRIBE CONTROL SYSTEM:

Schust 2 module, size 1015, Model 168, Pulse Jet Dust Collector in a single configuration.
A solid state timer provides sequential pulsing of the air valves.
See control device PFD on the next page.

POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}	
BEFORE CONTROL EMISSION RATE (LB/HR):	1.12	0.50	0.08	
CAPTURE EFFICIENCY:	95 %	95 %	95 %	%
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %	%
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %	%
EFFICIENCY DETERMINATION CODE:	1	1	1	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.011	0.005	0.0007	

PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20		GAUGE?	☒ YES ☐ NO
BULK PARTICLE DENSITY (LB/FT ³): 90		INLET TEMPERATURE (°F): MIN 0 MAX 115	
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³		OUTLET TEMPERATURE (°F) MIN 0 MAX 115	
INLET AIR FLOW RATE (ACFM): 40,800		FILTER OPERATING TEMP (°F): Ambient	
NO. OF COMPARTMENTS: 2	NO. OF BAGS PER COMPARTMENT: 150	LENGTH OF BAG (IN.): 168	
NO. OF CARTRIDGES: 300	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22	DIAMETER OF BAG (IN.): 6	
TOTAL FILTER SURFACE AREA (FT ²): 6,600		AIR TO CLOTH RATIO: 6.18	
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE		FILTER MATERIAL: ☐ WOVEN ☒ FELTED	

DESCRIBE CLEANING PROCEDURES:

- ☒ AIR PULSE
- ☐ SONIC
- ☐ REVERSE FLOW
- ☐ SIMPLE BAG COLLAPSE
- ☐ MECHANICAL/SHAKER
- ☐ RING BAG COLLAPSE
- ☐ OTHER:

DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.

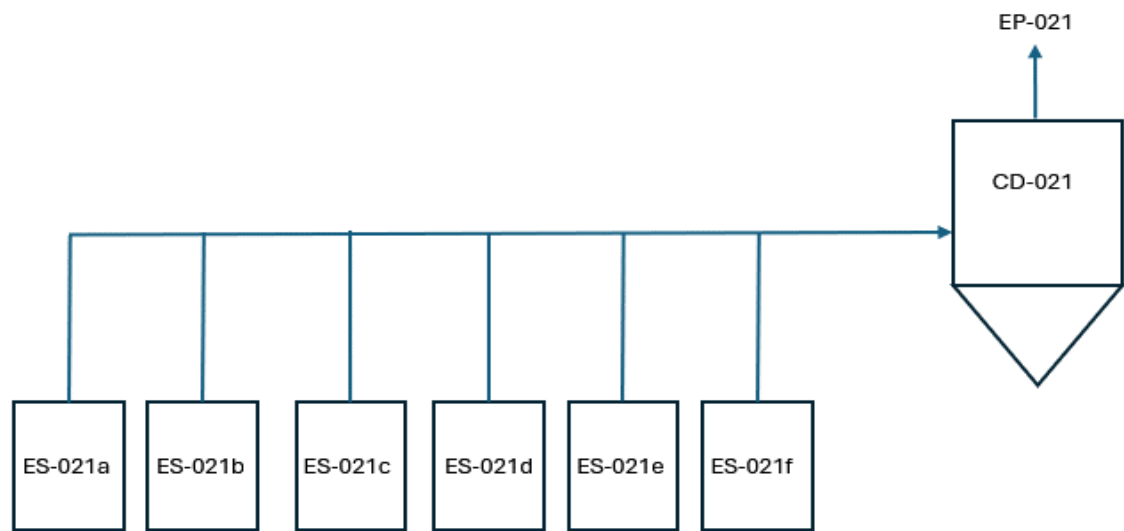
PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	0	0
1-10	58	58
10-25	42	100
25-50	0	100
50-100	0	100
>100	0	100
TOTAL = 100		

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Tertiary Crusher Baghouse (CD-021)



Plant Feed Stockpile Operations

ES-035

ES-040a - ES-040f

CD-040

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Stockpile Feed Conveyor #2	EMISSION SOURCE ID NO: ES-035
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant stockpile feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0032	0.0112	0.0641	0.2808	0.0032	0.0140
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0011	0.0037	0.0211	0.0923	0.0011	0.0046
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0032	0.0138	0.0002	0.0007
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Stockpile Feed Conveyor #2	EMISSION SOURCE ID NO: ES-035
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Plant stockpile feed conveyor with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	458	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Stockpile Stacking Conveyor	EMISSION SOURCE ID NO: ES-040a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0032	0.0112	0.0641	0.2808	0.0032	0.0140
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0011	0.0037	0.0211	0.0923	0.0011	0.0046
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0032	0.0138	0.0002	0.0007
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Stockpile Stacking Conveyor	EMISSION SOURCE ID NO: ES-040a
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	458	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: Natural Gas	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): 30
MAX. CAPACITY HOURLY FUEL USE: 30 MMBtu/hr	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Plant Feed Stockpile	EMISSION SOURCE ID NO: ES-040b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0284	0.0994	0.5675	2.4857	0.0284	0.1243
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0134	0.0470	0.2684	1.1757	0.0134	0.0588
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0020	0.0071	0.0406	0.1780	0.0020	0.0089
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Plant Feed Stockpile	EMISSION SOURCE ID NO: ES-040b
	CONTROL DEVICE ID NO(S): CD-040
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-040

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	458	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: Natural Gas	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): 30
MAX. CAPACITY HOURLY FUEL USE: 30 MMBtu/hr	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Plant Feed Belt Feeder #1/#2	EMISSION SOURCE ID NO: ES-040c&d
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0032	0.0112	0.0641	0.2808	0.0032	0.0140
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0011	0.0037	0.0211	0.0923	0.0011	0.0046
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0032	0.0138	0.0002	0.0007
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Stockpile Discharge Conveyor	EMISSION SOURCE ID NO: ES-040e
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): 000 ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0027	0.0094	0.0535	0.2342	0.0027	0.0117
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0009	0.0031	0.0176	0.0770	0.0009	0.0038
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0005	0.0026	0.0115	0.0001	0.0006
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Stockpile Discharge Conveyor	EMISSION SOURCE ID NO: ES-040e
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	382	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: Natural Gas	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): 30
MAX. CAPACITY HOURLY FUEL USE: 30 MMBtu/hr	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: DMS Feed Conveyor	EMISSION SOURCE ID NO: ES-040f
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-040
EMISSION POINT (STACK) ID NO(S): EP-040	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0027	0.0094	0.0535	0.2342	0.0027	0.0117
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0009	0.0031	0.0176	0.0770	0.0009	0.0038
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0001	0.0005	0.0026	0.0115	0.0001	0.0006
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: DMS Feed Conveyor	EMISSION SOURCE ID NO: ES-040f
	CONTROL DEVICE ID NO(S): CD-040
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-040

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Plant feed stockpile operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	382	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: Natural Gas	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): 30
MAX. CAPACITY HOURLY FUEL USE: 30 MMBtu/hr	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO:	CD-040	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):	ES-035, ES-040a through ES-040f
EMISSION POINT (STACK) ID NO(S):	EP-040	POSITION IN SERIES OF CONTROLS	NO. 1 OF 1 UNITS

OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO

DESCRIBE CONTROL SYSTEM:

Schust 2 module, size 1215, Model 168, Pulse Jet Dust Collector in a single configuration.
A solid state timer provides sequential pulsing of the air valves.
See control device PFD on the next page.

POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}	
BEFORE CONTROL EMISSION RATE (LB/HR):	0.87	0.37	0.06	
CAPTURE EFFICIENCY:	95 %	95 %	95 %	%
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %	%
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %	%
EFFICIENCY DETERMINATION CODE:	1	1	1	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.008	0.003	0.0005	

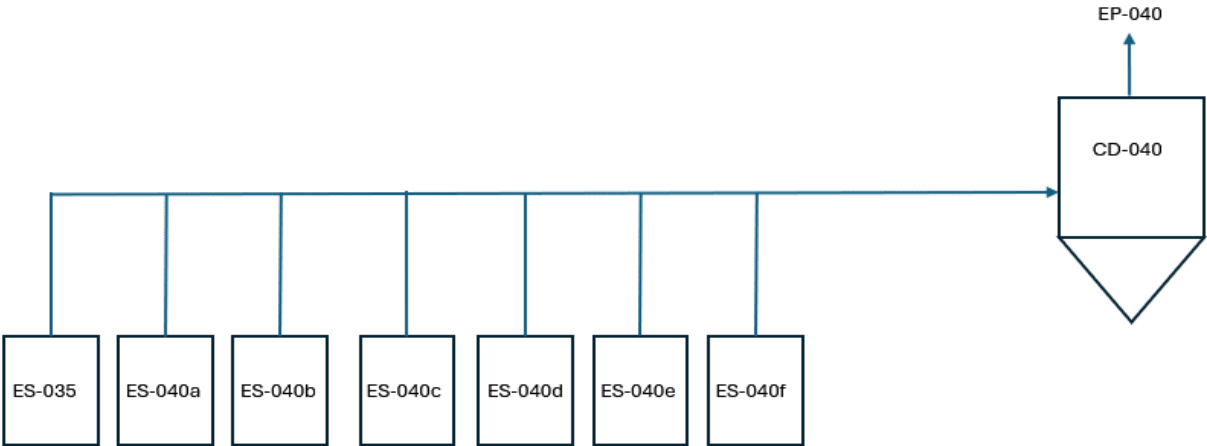
PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20 GAUGE? ☒ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT ³): 90	INLET TEMPERATURE (°F): MIN 0 MAX 115	
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³	OUTLET TEMPERATURE (°F) MIN 0 MAX 115	
INLET AIR FLOW RATE (ACFM): 43,300	FILTER OPERATING TEMP (°F): Ambient	
NO. OF COMPARTMENTS: 2	NO. OF BAGS PER COMPARTMENT: 180	LENGTH OF BAG (IN.): 168
NO. OF CARTRIDGES: 360	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22	DIAMETER OF BAG (IN.): 6
TOTAL FILTER SURFACE AREA (FT ²): 7,920		AIR TO CLOTH RATIO: 5.47
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE		FILTER MATERIAL: ☐ WOVEN ☒ FELTED

DESCRIBE CLEANING PROCEDURES: ☒ AIR PULSE ☐ REVERSE FLOW ☐ MECHANICAL/SHAKER ☐ OTHER: ☐ SONIC ☐ SIMPLE BAG COLLAPSE ☐ RING BAG COLLAPSE	<table border="1" style="width: 100%; border-collapse: collapse;"><tr><th colspan="3">PARTICLE SIZE DISTRIBUTION</th></tr><tr><th>SIZE (MICRONS)</th><th>WEIGHT % OF TOTAL</th><th>CUMULATIVE %</th></tr><tr><td>0-1</td><td>0</td><td>0</td></tr><tr><td>1-10</td><td>58</td><td>58</td></tr><tr><td>10-25</td><td>42</td><td>100</td></tr><tr><td>25-50</td><td>0</td><td>100</td></tr><tr><td>50-100</td><td>0</td><td>100</td></tr><tr><td>>100</td><td>0</td><td>100</td></tr><tr><td colspan="3" style="text-align: center;">TOTAL = 100</td></tr></table>	PARTICLE SIZE DISTRIBUTION			SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %	0-1	0	0	1-10	58	58	10-25	42	100	25-50	0	100	50-100	0	100	>100	0	100	TOTAL = 100		
PARTICLE SIZE DISTRIBUTION																												
SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %																										
0-1	0	0																										
1-10	58	58																										
10-25	42	100																										
25-50	0	100																										
50-100	0	100																										
>100	0	100																										
TOTAL = 100																												

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Stockpile Sizing Screen Baghouse (CD-040)



DMS Dryer Operations

ES-039a - ES-039d

CD-039

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: DMS Feed Bin	EMISSION SOURCE ID NO: ES-039a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-039
EMISSION POINT (STACK) ID NO(S): EP-039	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Bin fed from plant stockpile with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0237	0.0829	0.4733	2.0732	0.0237	0.1037
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0112	0.0392	0.2239	0.9806	0.0112	0.0490
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0017	0.0059	0.0339	0.1485	0.0017	0.0074
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-039a	
DMS Feed Bin				CONTROL DEVICE ID NO(S): CD-039	
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-039	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Plant stockpile material is conveyed to the bin with dust pickups. See PFD Figure 3 in Section 3.					
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 170	
CAPACITY		CUBIC FEET: 2,100		TONS: 170	
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 25 WIDTH: 20 HEIGHT: 30
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 2,677,056		MAXIMUM DESIGN CAPACITY: 3,346,320	
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units
NO. FILL TUBES:					
MAXIMUM ACFM:					
MATERIAL IS UNLOADED TO: DMS prepping screen					
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Conveyor					
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 382					
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 382					
COMMENTS:					

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Belt Feeder - DMS #1	EMISSION SOURCE ID NO: ES-039b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-039
EMISSION POINT (STACK) ID NO(S): EP-039	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant stockpile material conveyed with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0007	0.0023	0.0134	0.0586	0.0007	0.0029
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0002	0.0008	0.0044	0.0192	0.0002	0.0010
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0001	0.0007	0.0029	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Belt Feeder - DMS #1	EMISSION SOURCE ID NO: ES-039b
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-039
EMISSION POINT (STACK) ID NO(S): EP-039	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Plant stockpile material conveyed with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	95.5	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Belt Feeder - DMS #2	EMISSION SOURCE ID NO: ES-039c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-039
EMISSION POINT (STACK) ID NO(S): EP-039	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Plant stockpile material conveyed with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0007	0.0023	0.0134	0.0586	0.0007	0.0029
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0002	0.0008	0.0044	0.0192	0.0002	0.0010
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0001	0.0007	0.0029	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Belt Feeder - DMS #2	EMISSION SOURCE ID NO: ES-039c
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-039
EMISSION POINT (STACK) ID NO(S): EP-039	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Plant stockpile material conveyed with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	95.5	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: DMS Dryer	EMISSION SOURCE ID NO: ES-039d
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-039
EMISSION POINT (STACK) ID NO(S): EP-039	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

One Source FT Series rotary dryer with dust pickups. Natural gas fired. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☒ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD

DATE MANUFACTURED: TBD

MANUFACTURER / MODEL NO.: One Source - FT Series Rotary Dryer

EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR

IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO

☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42 1.4-2	0.2222	0.99	0.26	1.18	0.22	0.99
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42 1.4-2	0.2211	0.98	0.24	1.07	0.22	0.98
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42 1.4-2	0.2202	0.98	0.22	0.99	0.22	0.98
SULFUR DIOXIDE (SO ₂)	AP-42 1.4-2	0.02	0.08	0.02	0.08	0.02	0.08
NITROGEN OXIDES (NO _x)	AP-42 1.4-2	1.05	4.6	1.05	4.6	1.05	4.6
CARBON MONOXIDE (CO)	AP-42 1.4-2	2.47	10.82	2.47	10.82	2.47	10.82
VOLATILE ORGANIC COMPOUNDS (VOC)	AP-42 1.4-2	0.16	0.71	0.16	0.71	0.16	0.71
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
Benzene	71432	AP-42 1.4-3	6.18E-05	2.71E-04	6.18E-05	2.71E-04	6.18E-05	2.71E-04
Benzo(a)pyrene	50328	AP-42 1.4-3	3.53E-08	1.55E-07	3.53E-08	1.55E-07	3.53E-08	1.55E-07
Dichlorobenzene	106467	AP-42 1.4-3	3.53E-05	1.55E-04	3.53E-05	1.55E-04	3.53E-05	1.55E-04
Formaldehyde	50000	AP-42 1.4-3	2.21E-03	9.66E-03	2.21E-03	9.66E-03	2.21E-03	9.66E-03
Hexane	110543	AP-42 1.4-3	5.29E-02	2.32E-01	5.29E-02	2.32E-01	5.29E-02	2.32E-01
Naphthalene	91203	AP-42 1.4-3	1.79E-05	7.86E-05	1.79E-05	7.86E-05	1.79E-05	7.86E-05
Toluene	108883	AP-42 1.4-3	1.00E-04	4.38E-04	1.00E-04	4.38E-04	1.00E-04	4.38E-04

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
Benzene	71432	AP-42 1.4-3	6.18E-05	1.48E-03	2.25E-02
Benzo(a)pyrene	50328	AP-42 1.4-3	3.53E-08	8.47E-07	1.29E-05
Dichlorobenzene	106467	AP-42 1.4-3	3.53E-05	8.47E-04	1.29E-02
Formaldehyde	50000	AP-42 1.4-3	2.21E-03	5.29E-02	8.05E-01
Hexane	110543	AP-42 1.4-3	0.05	1.27	19.32
Toluene	108883	AP-42 1.4-3	1.00E-04	2.40E-03	3.65E-02

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B1

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B1

EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO: ES-039d	
DMS Dryer		CONTROL DEVICE ID NO(S): CD-039	
OPERATING SCENARIO 1 OF 1		EMISSION POINT (STACK) ID NO(S): EP-039	
DESCRIBE USE: ☐ PROCESS HEAT ☐ SPACE HEAT ☐ ELECTRICAL GENERATION ☐ CONTINUOUS USE ☐ STAND BY/EMERGENCY ☒ OTHER (DESCRIBE): Dryer			
HEATING MECHANISM: ☐ INDIRECT ☒ DIRECT			
MAX. FIRING RATE (MMBTU/HOUR): 30.0			
WOOD-FIRED BURNER			
WOOD TYPE: ☐ BARK ☐ WOOD/BARK ☐ WET WOOD ☐ DRY WOOD ☐ OTHER (DESCRIBE): _____			
PERCENT MOISTURE OF FUEL: _____			
☐ UNCONTROLLED ☐ CONTROLLED WITH FLYASH REINJECTION ☐ CONTROLLED W/O REINJECTION			
FUEL FEED METHOD:		HEAT TRANSFER MEDIA: ☐ STEAM ☐ AIR ☐ OTHER (DESCRIBE) _____	
COAL-FIRED BURNER			
TYPE OF BOILER		IF OTHER DESCRIBE:	
PULVERIZED ☐ WET BED ☐ DRY BED	OVERFEED STOKER ☐ UNCONTROLLED ☐ CONTROLLED	UNDERFEED STOKER ☐ UNCONTROLLED ☐ CONTROLLED	SPREADER STOKER ☐ UNCONTROLLED ☐ FLYASH REINJECTION ☐ NO FLYASH REINJECTION
FLUIDIZED BED ☐ CIRCULATING ☐ RECIRCULATING			
OIL/GAS-FIRED BURNER			
TYPE OF BOILER: ☐ UTILITY ☒ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL			
TYPE OF FIRING: ☒ NORMAL ☐ TANGENTIAL ☐ LOW NOX BURNERS ☐ NO LOW NOX BURNER			
OTHER FUEL-FIRED BURNER			
TYPE(S) OF FUEL: _____ PE			
TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL			
TYPE OF FIRING: _____ TYPE(S) OF CONTROL(S) (IF ANY): _____			
FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)			
FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Natural Gas	MMBtu/hr	30 MMBtu/hr	N/A
FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)			
FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)
Natural Gas	1020 Btu/scf		
COMMENTS:			

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

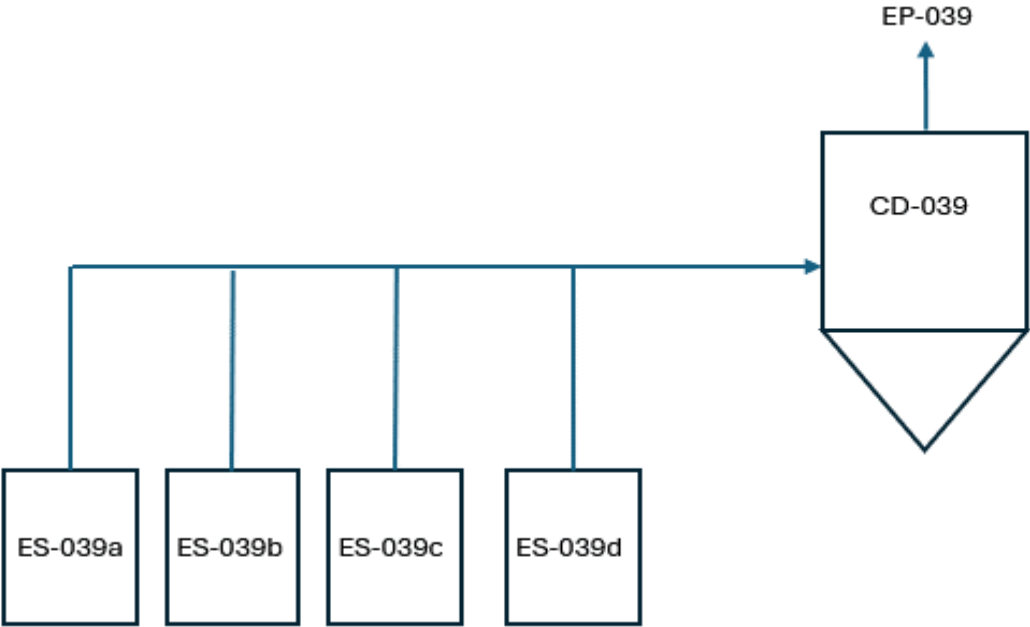
REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO: CD-039		CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-039a through ES-039d DMS Dryer Building																																				
EMISSION POINT (STACK) ID NO(S): EP-039		POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS																																				
OPERATING SCENARIO:																																						
1 OF 1		P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO																																				
DESCRIBE CONTROL SYSTEM: Schust 1 module, size 1315, Model 168, Pulse Jet Dust Collector in a single configuration. A solid state timer provides sequential pulsing of the air valves. See control device PFD on the next page.																																						
<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 40%;">POLLUTANTS COLLECTED:</td><td style="width: 15%;">PM</td><td style="width: 15%;">PM₁₀</td><td style="width: 15%;">PM_{2.5}</td><td style="width: 15%;"></td></tr><tr><td>BEFORE CONTROL EMISSION RATE (LB/HR):</td><td>0.54</td><td>0.25</td><td>0.04</td><td></td></tr><tr><td>CAPTURE EFFICIENCY:</td><td>95 %</td><td>95 %</td><td>95 %</td><td></td></tr><tr><td>CONTROL DEVICE EFFICIENCY:</td><td>99 %</td><td>99 %</td><td>99 %</td><td></td></tr><tr><td>CORRESPONDING OVERALL EFFICIENCY:</td><td>94.05 %</td><td>94.05 %</td><td>94.05 %</td><td></td></tr><tr><td>EFFICIENCY DETERMINATION CODE:</td><td>1</td><td>1</td><td>1</td><td></td></tr><tr><td>TOTAL AFTER CONTROL EMISSION RATE (LB/HR):</td><td>0.005</td><td>0.002</td><td>0.0004</td><td></td></tr></table>				POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}		BEFORE CONTROL EMISSION RATE (LB/HR):	0.54	0.25	0.04		CAPTURE EFFICIENCY:	95 %	95 %	95 %		CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %		CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %		EFFICIENCY DETERMINATION CODE:	1	1	1		TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.005	0.002	0.0004	
POLLUTANTS COLLECTED:	PM	PM ₁₀	PM _{2.5}																																			
BEFORE CONTROL EMISSION RATE (LB/HR):	0.54	0.25	0.04																																			
CAPTURE EFFICIENCY:	95 %	95 %	95 %																																			
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %																																			
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %																																			
EFFICIENCY DETERMINATION CODE:	1	1	1																																			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.005	0.002	0.0004																																			
PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20 GAUGE? ☒ YES ☐ NO																																						
BULK PARTICLE DENSITY (LB/FT ³): 90		INLET TEMPERATURE (°F): MIN 0 MAX 115																																				
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³		OUTLET TEMPERATURE (°F) MIN 0 MAX 115																																				
INLET AIR FLOW RATE (ACFM): 43,300		FILTER OPERATING TEMP (°F): Ambient																																				
NO. OF COMPARTMENTS: 1	NO. OF BAGS PER COMPARTMENT: 195		LENGTH OF BAG (IN.): 168																																			
NO. OF CARTRIDGES: 195	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22		DIAMETER OF BAG (IN.): 6																																			
TOTAL FILTER SURFACE AREA (FT ²): 4,290		AIR TO CLOTH RATIO: 5.83																																				
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE FILTER MATERIAL: ☐ WOVEN ☒ FELTED																																						
DESCRIBE CLEANING PROCEDURES: ☒ AIR PULSE ☐ SONIC ☐ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE ☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE ☐ OTHER:		PARTICLE SIZE DISTRIBUTION																																				
		SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %																																		
		0-1	0	0																																		
		1-10	58	58																																		
		10-25	42	100																																		
		25-50	0	100																																		
		50-100	0	100																																		
		>100	0	100																																		
DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.		TOTAL = 100																																				
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):																																						
COMMENTS:																																						

DMS Dryer Baghouse (CD-039)



DMS and Magnetic Separation Operations

ES-042

ES-047

ES-032

ES-043a - ES-043g

ES-051

CD-043

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Dryer Discharge Conveyor #1	EMISSION SOURCE ID NO: ES-042
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

DMS dryer discharge conveyor with dust pickups. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0003	0.0009	0.0050	0.0221	0.0003	0.0011
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0001	0.0003	0.0017	0.0073	0.0001	0.0004
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0000	0.0002	0.0011	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Dryer Discharge Conveyor #1	EMISSION SOURCE ID NO: ES-042
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
DMS dryer discharge conveyor with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	36	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Dryer Discharge Conveyor #2	EMISSION SOURCE ID NO: ES-047
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

DMS dryer discharge conveyor with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0003	0.0009	0.0050	0.0221	0.0003	0.0011
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0001	0.0003	0.0017	0.0073	0.0001	0.0004
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0000	0.0002	0.0011	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Dryer Discharge Conveyor #2	EMISSION SOURCE ID NO: ES-047
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
DMS dryer discharge conveyor with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	36	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Dryer Discharge Conveyor #3	EMISSION SOURCE ID NO: ES-032
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

DMS dryer discharge conveyor with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0003	0.0009	0.0050	0.0221	0.0003	0.0011
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0001	0.0003	0.0017	0.0073	0.0001	0.0004
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0000	0.0002	0.0011	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-032

CONTROL DEVICE ID NO(S): CD-043

EMISSION POINT (STACK) ID NO(S): EP-043

DMS dryer discharge conveyor with dust pickups. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Dryer Discharge Conveyor #4	EMISSION SOURCE ID NO: ES-043a
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

DMS feed operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0003	0.0009	0.0050	0.0221	0.0003	0.0011
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0001	0.0003	0.0017	0.0073	0.0001	0.0004
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0000	0.0002	0.0011	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Magnetic Feed Bin	EMISSION SOURCE ID NO: ES-043b
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): 000 ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0022	0.0083	0.0446	0.1954	0.0022	0.0098
PARTICULATE MATTER <10 MICRONS (PM ₁₀)	AP-42	0.0011	0.0039	0.0211	0.0924	0.0011	0.0046
PARTICULATE MATTER <2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0032	0.0140	0.0002	0.0007
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-043b			
Magnetic Feed Bin				CONTROL DEVICE ID NO(S): CD-043			
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-043			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): The DMS operations are fed from the plant stockpile via conveyor with dust pickups. See PFD Figure 3 in Section 3.							
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 170			
CAPACITY		CUBIC FEET: 1,000		TONS: 75 tons			
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 22	WIDTH: 20	HEIGHT: 30
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 268,056		MAXIMUM DESIGN CAPACITY: 315,360			
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM		
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units		
NO. FILL TUBES:							
MAXIMUM ACFM:							
MATERIAL IS UNLOADED TO: Magnetic separation operations							
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Belt Conveyor							
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 36							
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 36							
COMMENTS:							

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: LIMS Vibrating Feeder #1/#2	EMISSION SOURCE ID NO: ES-043c
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): 000 ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0003	0.0009	0.0050	0.0221	0.0003	0.0011
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0001	0.0003	0.0017	0.0073	0.0001	0.0004
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0000	0.0002	0.0011	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: LIMS Coarse Drums #1/#2	EMISSION SOURCE ID NO: ES-043d
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0022	0.0083	0.0446	0.1954	0.0022	0.0098
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0011	0.0039	0.0211	0.0924	0.0011	0.0046
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0006	0.0032	0.0140	0.0002	0.0007
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: LIMS Coarse Drums #1/#2	EMISSION SOURCE ID NO: ES-043d CONTROL DEVICE ID NO(S): CD-043
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-043

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	36	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Coarse High Intensity Magnetic Separators	EMISSION SOURCE ID NO: ES-043e
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0030	0.0111	0.0597	0.2616	0.0030	0.0131
PARTICULATE MATTER <10 MICRONS (PM ₁₀)	AP-42	0.0013	0.0049	0.0261	0.1142	0.0013	0.0057
PARTICULATE MATTER <2.5 MICRONS (PM _{2.5})	AP-42	0.0002	0.0007	0.0039	0.0173	0.0002	0.0009
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Coarse Magnetics Conveyor	EMISSION SOURCE ID NO: ES-043f
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): 000 ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0000	0.0000	0.0001	0.0005	0.0000	0.0000
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Coarse Magnetics Conveyor	EMISSION SOURCE ID NO: ES-043f
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	0.74	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Coarse Concentrate Conveyor #1	EMISSION SOURCE ID NO: ES-043g
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0003	0.0009	0.0050	0.0221	0.0003	0.0011
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0001	0.0003	0.0017	0.0073	0.0001	0.0004
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0000	0.0000	0.0002	0.0011	0.0000	0.0001
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Coarse Concentrate Conveyor #1	EMISSION SOURCE ID NO: ES-043g
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): CD-043
EMISSION POINT (STACK) ID NO(S): EP-043	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Dense media separation operations with dust pickups. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Ore	tons	36	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Methyl Isobutyl Carbinol (MIBC) usage	EMISSION SOURCE ID NO: ES-051
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-051	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Methyl isobutyl carbinol is added from totes as a reagent in the Concentrator. See PFD Figure 3 in Section 3.
MIBC is not a listed HAP.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?): ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})							
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)	Material Balance	2.74	12.00	4.57	20.00	4.57	20.00
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr
N/A					

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Methyl Isobutyl Carbinal (MIBC) usage	EMISSION SOURCE ID NO: ES-051
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-051	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Methyl isobutyl carbinol is added from totes as a reagent in the Concentrator. See PFD Figure 3 in Section 3.

MIBC is not a listed HAP.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Methyl Isobutyl Carbinal (MIBC)	pounds	4.57	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

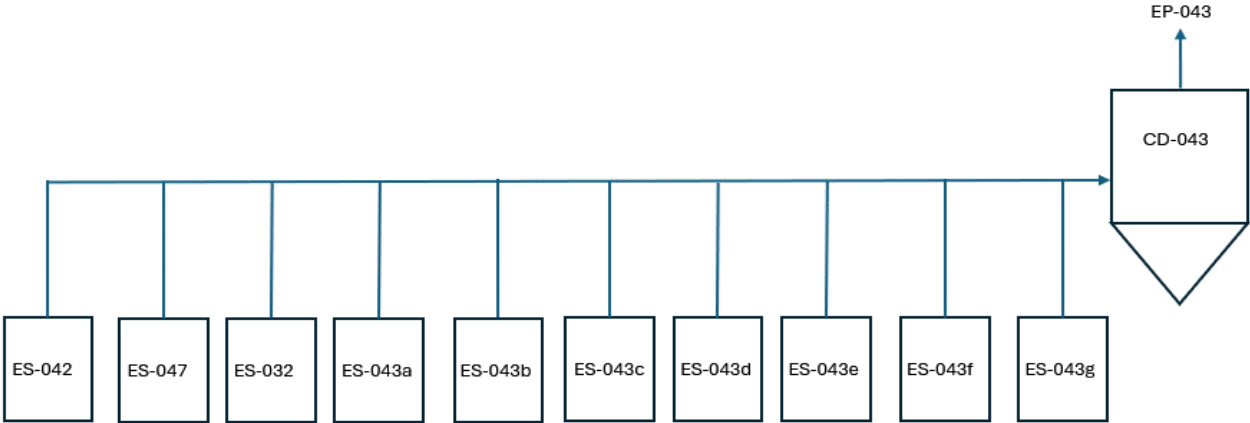
REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

C1

CONTROL DEVICE ID NO: CD-043		CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-043a through ES-043g, ES-032, ES-042, ES-047																																									
EMISSION POINT (STACK) ID NO(S): EP-043		POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS																																									
OPERATING SCENARIO:																																											
1 OF 1		P.E. SEAL REQUIRED (PER 2q .0112)? ☒ YES ☐ NO																																									
DESCRIBE CONTROL SYSTEM: Schust 2 module, size 1015, Model 168, Pulse Jet Dust Collector in a single configuration. A solid state timer provides sequential pulsing of the air valves. See control device PFD on the next page.																																											
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 40%;"></th><th style="width: 10%;">PM</th><th style="width: 10%;">PM₁₀</th><th style="width: 10%;">PM_{2.5}</th><th style="width: 10%;"></th></tr></thead><tbody><tr><td>POLLUTANTS COLLECTED:</td><td></td><td></td><td></td><td></td></tr><tr><td>BEFORE CONTROL EMISSION RATE (LB/HR):</td><td>0.18</td><td>0.08</td><td>0.01</td><td></td></tr><tr><td>CAPTURE EFFICIENCY:</td><td>95 %</td><td>95 %</td><td>95 %</td><td></td></tr><tr><td>CONTROL DEVICE EFFICIENCY:</td><td>99 %</td><td>99 %</td><td>99 %</td><td></td></tr><tr><td>CORRESPONDING OVERALL EFFICIENCY:</td><td>94.05 %</td><td>94.05 %</td><td>94.05 %</td><td></td></tr><tr><td>EFFICIENCY DETERMINATION CODE:</td><td>1</td><td>1</td><td>1</td><td></td></tr><tr><td>TOTAL AFTER CONTROL EMISSION RATE (LB/HR):</td><td>0.002</td><td>0.0007</td><td>0.0001</td><td></td></tr></tbody></table>					PM	PM ₁₀	PM _{2.5}		POLLUTANTS COLLECTED:					BEFORE CONTROL EMISSION RATE (LB/HR):	0.18	0.08	0.01		CAPTURE EFFICIENCY:	95 %	95 %	95 %		CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %		CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %		EFFICIENCY DETERMINATION CODE:	1	1	1		TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.002	0.0007	0.0001	
	PM	PM ₁₀	PM _{2.5}																																								
POLLUTANTS COLLECTED:																																											
BEFORE CONTROL EMISSION RATE (LB/HR):	0.18	0.08	0.01																																								
CAPTURE EFFICIENCY:	95 %	95 %	95 %																																								
CONTROL DEVICE EFFICIENCY:	99 %	99 %	99 %																																								
CORRESPONDING OVERALL EFFICIENCY:	94.05 %	94.05 %	94.05 %																																								
EFFICIENCY DETERMINATION CODE:	1	1	1																																								
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.002	0.0007	0.0001																																								
PRESSURE DROP (IN H ₂ O): MIN: -10 MAX: -20 GAUGE? ☒ YES ☐ NO																																											
BULK PARTICLE DENSITY (LB/FT ³): 90		INLET TEMPERATURE (°F): MIN 0 MAX 115																																									
POLLUTANT LOADING RATE: ☐ LB/HR ☒ GR/FT ³		OUTLET TEMPERATURE (°F) MIN 0 MAX 115																																									
INLET AIR FLOW RATE (ACFM): 43,300		FILTER OPERATING TEMP (°F): Ambient																																									
NO. OF COMPARTMENTS: 2	NO. OF BAGS PER COMPARTMENT: 180		LENGTH OF BAG (IN.): 168																																								
NO. OF CARTRIDGES: 360	FILTER SURFACE AREA PER CARTRIDGE (FT ²): 22		DIAMETER OF BAG (IN.): 6																																								
TOTAL FILTER SURFACE AREA (FT ²): 7,920		AIR TO CLOTH RATIO: 5.47																																									
DRAFT TYPE: ☒ INDUCED/NEGATIVE ☐ FORCED/POSITIVE FILTER MATERIAL: ☐ WOVEN ☒ FELTED																																											
DESCRIBE CLEANING PROCEDURES: ☒ AIR PULSE ☐ SONIC ☐ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE ☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE ☐ OTHER:		PARTICLE SIZE DISTRIBUTION																																									
		SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %																																							
		0-1	0	0																																							
		1-10	58	58																																							
		10-25	42	100																																							
		25-50	0	100																																							
		50-100	0	100																																							
		>100	0	100																																							
DESCRIBE INCOMING AIR STREAM: Fan draws air stream from transfer points and open areas into the unit which then intermittently purges to return material back onto the conveyor.		TOTAL = 100																																									
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):																																											
COMMENTS:																																											

DMS and Mag Sep Baghouse (CD-043)



Product Loading and Conveying

ES-005

ES-007 - ES-013

ES-015

ES-024

ES-025

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Sorter Rejects Bin	EMISSION SOURCE ID NO: ES-024
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-024
EMISSION POINT (STACK) ID NO(S): EP-024	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Sorter rejects bin with bin vent filter. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0061	0.0226	0.1214	0.5319	0.0061	0.0266
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0029	0.0107	0.0574	0.2516	0.0029	0.0126
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0004	0.0016	0.0087	0.0381	0.0004	0.0019
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-024	
Sorter Rejects Bin				CONTROL DEVICE ID NO(S): CD-024	
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-024	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Sorter rejects material is conveyed to the bin with dust pickups. See PFD Figure 3 in Section 3.					
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 170	
CAPACITY		CUBIC FEET: 2,000		TONS: 165	
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 25 WIDTH: 20 HEIGHT: 75
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 729,708		MAXIMUM DESIGN CAPACITY: 858,480	
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units
NO. FILL TUBES:					
MAXIMUM ACFM:					
MATERIAL IS UNLOADED TO: Trucks					
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Dropped					
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 98					
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 98					
COMMENTS:					

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: DMS Rejects Bin (Coarse Tails Bin)	EMISSION SOURCE ID NO: ES-025
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-025
EMISSION POINT (STACK) ID NO(S): EP-025	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

DMS rejects bin with bin vent filter. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0050	0.0187	0.1004	0.4396	0.0050	0.0220
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0024	0.0088	0.0475	0.2079	0.0024	0.0104
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0004	0.0013	0.0072	0.0315	0.0004	0.0016
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-025	
DMS Rejects Bin (Coarse Tails Bin)				CONTROL DEVICE ID NO(S): CD-025	
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-025	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): DMS rejects material is conveyed to the bin with dust pickups. See PFD Figure 3 in Section 3.					
MATERIAL STORED: Ore				DENSITY OF MATERIAL (LB/FT ³): 170	
CAPACITY		CUBIC FEET: 2,000		TONS: 165	
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 25 WIDTH: 20 HEIGHT: 75
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 603,126		MAXIMUM DESIGN CAPACITY: 709,560	
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units
NO. FILL TUBES:					
MAXIMUM ACFM:					
MATERIAL IS UNLOADED TO: Trucks					
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Dropped					
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 81					
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 81					
COMMENTS:					

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Concentrate Load Out Bin	EMISSION SOURCE ID NO: ES-013
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-013
EMISSION POINT (STACK) ID NO(S): EP-013	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate load out bin with bin vent filter. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0038	0.0143	0.0768	0.3365	0.0038	0.0168
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0018	0.0068	0.0363	0.1592	0.0018	0.0080
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0003	0.0010	0.0055	0.0241	0.0003	0.0012
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-013	
Concentrate Load Out Bin				CONTROL DEVICE ID NO(S): CD-013	
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-013	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Spodumene concentrate is conveyed to the load out bins which are controlled with bin vent filters. See PFD Figure 3 in Section 3.					
MATERIAL STORED: Spodumene Concentrate				DENSITY OF MATERIAL (LB/FT ³): 172	
CAPACITY		CUBIC FEET: 60,000		TONS: 5,100	
DIMENSIONS (FEET)		HEIGHT: 90	DIAMETER: 70	(OR)	LENGTH: WIDTH: HEIGHT:
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 461,652		MAXIMUM DESIGN CAPACITY: 543,120	
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units
NO. FILL TUBES:					
MAXIMUM ACFM:					
MATERIAL IS UNLOADED TO: Conveyors that lead to truck or railcar loading					
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Conveyor					
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 62					
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 62					
COMMENTS:					

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Concentrate Load Out Bin	EMISSION SOURCE ID NO: ES-012
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-012
EMISSION POINT (STACK) ID NO(S): EP-012	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate load out bin with bin vent filter. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0038	0.0143	0.0768	0.3365	0.0038	0.0168
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0018	0.0068	0.0363	0.1592	0.0018	0.0080
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0003	0.0010	0.0055	0.0241	0.0003	0.0012
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-012	
Concentrate Load Out Bin				CONTROL DEVICE ID NO(S): CD-012	
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-012	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Spodumene concentrate is conveyed to the load out bins which are controlled with bin vent filters. See PFD Figure 3 in Section 3.					
MATERIAL STORED: Spodumene Concentrate				DENSITY OF MATERIAL (LB/FT ³): 172	
CAPACITY		CUBIC FEET: 60,000		TONS: 5,100	
DIMENSIONS (FEET)		HEIGHT: 90	DIAMETER: 70	(OR)	LENGTH: WIDTH: HEIGHT:
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 461,652		MAXIMUM DESIGN CAPACITY: 543,120	
PNEUMATICALLY FILLED		MECHANICALLY FILLED		FILLED FROM	
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:		☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units	
NO. FILL TUBES:					
MAXIMUM ACFM:					
MATERIAL IS UNLOADED TO: Conveyors that lead to truck or railcar loading					
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Conveyor					
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 62					
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 62					
COMMENTS:					

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Concentrate Truck Load Out Belt Feeder	EMISSION SOURCE ID NO: ES-011
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-011	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate load out belt feeder. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0768	0.2860	0.0768	0.3365	0.0768	0.3365
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0363	0.1353	0.0363	0.1592	0.0363	0.1592
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0055	0.0205	0.0055	0.0241	0.0055	0.0241
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-011

CONTROL DEVICE ID NO(S): N/A

EMISSION POINT (STACK) ID NO(S): EP-011

Spodumene concentrate load out belt feeder. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Truck Load Out Stacker Conveyor	EMISSION SOURCE ID NO: ES-015
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-015	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate truck load out conveyor. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0768	0.2860	0.0768	0.3365	0.0768	0.3365
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0363	0.1353	0.0363	0.1592	0.0363	0.1592
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0055	0.0205	0.0055	0.0241	0.0055	0.0241
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-015

CONTROL DEVICE ID NO(S): N/A

EMISSION POINT (STACK) ID NO(S): EP-015

Spodumene concentrate truck load out conveyor. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Rail Load Out Conveyor #1	EMISSION SOURCE ID NO: ES-010
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-010	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

SEE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0087	0.0323	0.0087	0.0380	0.0087	0.0380
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0029	0.0106	0.0029	0.0125	0.0029	0.0125
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0004	0.0016	0.0004	0.0019	0.0004	0.0019
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-010

CONTROL DEVICE ID NO(S): N/A

EMISSION POINT (STACK) ID NO(S): EP-010

Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Rail Load Out Conveyor #2	EMISSION SOURCE ID NO: ES-009
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-009	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0087	0.0323	0.0087	0.0380	0.0087	0.0380
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0029	0.0106	0.0029	0.0125	0.0029	0.0125
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0004	0.0016	0.0004	0.0019	0.0004	0.0019
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Rail Load Out Conveyor #2	EMISSION SOURCE ID NO: ES-009
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-009	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Spodumene Concentrate	tons	62	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Rail Load Out Conveyor #3	EMISSION SOURCE ID NO: ES-008
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-008	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

USE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0087	0.0323	0.0087	0.0380	0.0087	0.0380
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0029	0.0106	0.0029	0.0125	0.0029	0.0125
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0004	0.0016	0.0004	0.0019	0.0004	0.0019
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

EMISSION SOURCE (OTHER)

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE ID NO: ES-008

CONTROL DEVICE ID NO(S): N/A

EMISSION POINT (STACK) ID NO(S): EP-008

Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

[illegible]

REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
--	---------------

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A

REQUESTED CAPACITY ANNUAL FUEL USE: N/A

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Rail Load Out Conveyor #4	EMISSION SOURCE ID NO: ES-007
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-007	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☒ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): OOO ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0087	0.0323	0.0087	0.0380	0.0087	0.0380
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0029	0.0106	0.0029	0.0125	0.0029	0.0125
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0004	0.0016	0.0004	0.0019	0.0004	0.0019
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B9

EMISSION SOURCE DESCRIPTION: Rail Load Out Conveyor #4	EMISSION SOURCE ID NO: ES-007
OPERATING SCENARIO: 1 OF 1	CONTROL DEVICE ID NO(S): N/A
EMISSION POINT (STACK) ID NO(S): EP-007	

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Spodumene concentrate load out conveyor. See PFD Figure 3 in Section 3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Spodumene Concentrate	tons	62	N/A
MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B

EMISSION SOURCE DESCRIPTION: Rail Load Out Station Feed Bin	EMISSION SOURCE ID NO: ES-005
OPERATING SCENARIO 1 OF 1	CONTROL DEVICE ID NO(S): CD-005
EMISSION POINT (STACK) ID NO(S): EP-005	

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Rail Load Out Station Feed Bin with bin vent filter. See PFD Figure 3 in Section 3.

IS APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES:

☐ Coal, wood, oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int. combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☒ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: TBD	DATE MANUFACTURED: TBD
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJECT TO? ☒ NSPS (SUBPARTS?): 000 ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25 MAR-MAY 25 JUN-AUG 25 SEP-NOV 25	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	AP-42	0.0038	0.0143	0.0768	0.3365	0.0038	0.0168
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	AP-42	0.0018	0.0068	0.0363	0.1592	0.0018	0.0080
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	AP-42	0.0003	0.0010	0.0055	0.0241	0.0003	0.0012
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NO _x)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
			(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS		
			lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

FORM B6

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

B6

EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-005			
Rail Load Out Station Feed Bin				CONTROL DEVICE ID NO(S): CD-005			
OPERATING SCENARIO: 1 OF 1				EMISSION POINT(STACK) ID NO(S): EP-005			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Spodumene concentrate is conveyed to the rail load out bin which is controlled with a bin vent filter. See PDF attached at the beginning of this appendix.							
MATERIAL STORED: Spodumene Concentrate				DENSITY OF MATERIAL (LB/FT ³): 172			
CAPACITY		CUBIC FEET: 3200		TONS: 275 tons			
DIMENSIONS (FEET)		HEIGHT:	DIAMETER:	(OR)	LENGTH: 27	WIDTH: 27	HEIGHT: 76
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL: 461,652		MAXIMUM DESIGN CAPACITY: 543,120			
PNEUMATICALLY FILLED		MECHANICALLY FILLED			FILLED FROM		
☐ BLOWER ☐ COMPRESSOR ☐ OTHER:		☐ SCREW CONVEYOR ☒ BELT CONVEYOR ☐ BUCKET ELEVATOR ☐ OTHER:			☐ RAILCAR ☐ TRUCK ☐ STORAGE PILE ☒ OTHER: Upstream Process Units		
NO. FILL TUBES:							
MAXIMUM ACFM:							
MATERIAL IS UNLOADED TO: Railcars							
BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Dropped							
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 62							
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 1,500							
COMMENTS:							

Attach Additional Sheets As Necessary

Forms D1, D4, and D5

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

D1

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
AIR POLLUTANT EMITTED	tons/yr	tons/yr	tons/yr
PARTICULATE MATTER (PM)	6.11	58.26	8.06
PARTICULATE MATTER < 10 MICRONS (PM ₁₀)	3.19	22.84	4.02
PARTICULATE MATTER < 2.5 MICRONS (PM _{2.5})	1.36	4.33	1.49
SULFUR DIOXIDE (SO ₂)	0.62	0.62	0.62
NITROGEN OXIDES (NO _x)	7.32	7.32	7.32
CARBON MONOXIDE (CO)	11.53	11.53	11.53
VOLATILE ORGANIC COMPOUNDS (VOC)	12.71	20.71	20.71
LEAD			
GREENHOUSE GASES (GHG) (SHORT TONS)	3,466.76	3,466.76	3,466.76
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	tons/yr	tons/yr
1,3-Butadiene	106990	7.3E-05	7.3E-05	7.3E-05
Acetaldehyde	75070	1.4E-03	1.4E-03	1.4E-03
Acrolein	107028	1.7E-04	1.7E-04	1.7E-04
Benzene	71432	3.1E-07	3.1E-07	3.1E-07
Dichlorobenzene	106467	2.0E-03	2.0E-03	2.0E-03
Formaldehyde	50000	5.1E-07	5.1E-07	5.1E-07
Hexane	110543	1.5E-04	1.5E-04	1.5E-04
Naphthalene	91203	1.2E-02	1.2E-02	1.2E-02
Toluene	108883	2.5E-01	2.5E-01	2.5E-01
Xylenes	1330207	7.9E-05	7.9E-05	7.9E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Modeling Required ?		
					Yes	No	
1,3-Butadiene	106990	2.93E-04	7.04E-03	1.47E-01		X	
Acetaldehyde	75070	5.76E-03	0.14	2.88		X	
Acrolein	107028	6.94E-04	1.67E-02	3.47E-01		X	
Benzene	71432	7.06E-08	1.69E-06	6.18E-04		X	
Dichlorobenzene	106467	7.06E-03	0.17	4.04		X	
Formaldehyde	50000	1.45E-06	3.47E-05	1.01E-03		X	
Hexane	110543	3.53E-05	8.47E-04	3.09E-01		X	
Toluene	108883	0.35	8.44	503.20		X	
Xylenes	1330207	1.79E-05	4.31E-04	1.57E-01		X	

COMMENTS:

Attach Additional Sheets As Necessary

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

D4

ACTIVITIES EXEMPTED PER 2Q .0102 OR INSIGNIFICANT ACTIVITIES PER 2Q .0503 FOR TITLE V SOURCES

DESCRIPTION OF EMISSION SOURCE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY
1. IES-001, IES-002. IES-003, IES-004 Mobile Diesel Tanks	2,500-gal	2Q .0503(8)
2. IES-006 Diesel Storage Tank	25,000-gal	2Q .0503(8)
3. IES-110 Emergency Diesel Generator	536 hp	2Q .0503(8)
4. IES-111 Emergency Diesel Fire Pump Engine	536 hp	2Q .0503(8)
5. IES-112 Reagent Mixing and Storage (except MIBC)		2Q .0503(8)
6.		

Attach Additional Sheets As Necessary

FORM D5

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate

D5

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

- A SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9) -** SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.
- B SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY) -** PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED INFORMATION TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.
- C CONTROL DEVICE ANALYSIS (FORM C and C1 through C9) -** PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.
- D PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY) -** SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.
- E PROFESSIONAL ENGINEERING SEAL -** PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, William F. Karl attest that this application for Albemarle Kings Mountain Facility has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed \$10,000 as well as civil penalties up to \$25,000 per violation.

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME: William F. Karl

DATE: _____

COMPANY: SWCA Environmental Consultants

ADDRESS: 113 Edinburgh S Dr #120, Cary, NC 27511

TELEPHONE: (352) 214-5733

SIGNATURE: _____

PAGES CERTIFIED: Emission Calculations

NC DAQ Forms B, B1, B6, B9, and C

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APPENDIX B EMISSION CALCULATIONS

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Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Emissions Summary

Table 1.a. Summary of Uncontrolled PTE in Pounds Per Hour

Emissions Source	Uncontrolled PTE Emissions, lb/hr								
	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}	VOC	CO ₂ e	HAPs
Primary Ore Crushing	-	-	-	1.27	0.56	0.08	-	-	-
Secondary Ore Crushing	-	-	-	2.64	1.01	0.15	-	-	-
Ore Sorting	-	-	-	2.85	1.12	0.17	-	-	-
Tertiary Ore Crushing	-	-	-	4.07	1.30	0.20	-	-	-
Concentrator and Tailings	-	-	-	2.23	1.00	0.15	-	-	-
Bag Filters	-	-	-	N/A	N/A	N/A	-	-	-
Reagent Usage	-	-	-	-	-	-	4.57	-	-
Emergency Generator Engine	1.42	5.44	1.09	0.12	0.12	0.12	0.01	617.43	1.39E-02
Emergency Fire Pump Engine	1.42	5.44	1.09	0.12	0.12	0.12	0.01	617.43	1.39E-02
Dryer	2.47	1.05	0.02	0.22	0.22	0.22	0.16	721.02	5.55E-02
Total	5.31	11.92	2.19	13.52	5.44	1.21	4.75	1,955.87	0.08

Table 1.b. Summary of Uncontrolled PTE in Tons Per Year

Emissions Source	Uncontrolled Emissions, tons/year								
	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}	VOC	CO ₂ e	HAPs
Primary Ore Crushing	-	-	-	5.58	2.45	0.37	-	-	-
Secondary Ore Crushing	-	-	-	11.58	4.42	0.66	-	-	-
Ore Sorting	-	-	-	12.47	4.89	0.74	-	-	-
Tertiary Ore Crushing	-	-	-	17.83	5.67	0.86	-	-	-
Concentrator and Tailings	-	-	-	9.77	4.37	0.66	-	-	-
Bag Filters	-	-	-	N/A	N/A	N/A	-	-	-
Reagent Usage	-	-	-	-	-	-	20.00	-	-
Emergency Generator Engine	0.35	1.36	0.27	0.03	0.03	0.03	2.95E-03	154.36	3.48E-03
Emergency Firewater Pump Engine	0.35	1.36	0.27	0.03	0.03	0.03	2.95E-03	154.36	3.48E-03
Dryer	10.82	4.60	0.08	0.98	0.98	0.98	0.71	3,158.05	2.42E-01
Total	11.53	7.32	0.62	58.26	22.84	4.33	20.71	3,466.76	0.25

Table 1.c. Summary of Potential Controlled Emissions in Pounds Per Hour

Emissions Source	Controlled Emissions, lb/hr								
	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}	VOC	CO ₂ e	HAPs
Primary Ore Crushing	-	-	-	0.72	0.34	0.05	-	-	-
Secondary Ore Crushing	-	-	-	0.13	0.05	0.01	-	-	-
Ore Sorting	-	-	-	0.14	0.06	0.01	-	-	-
Tertiary Ore Crushing	-	-	-	0.20	0.06	0.01	-	-	-
Concentrator and Tailings	-	-	-	0.29	0.13	0.02	-	-	-
Bag Filters	-	-	-	0.12	0.04	0.01	-	-	-
Reagent Usage	-	-	-	-	-	-	4.57	-	-
Emergency Generator Engine	1.42	5.44	1.09	0.12	0.12	0.12	0.01	617.43	1.39E-02
Emergency Firewater Pump Engine	1.42	5.44	1.09	0.12	0.12	0.12	0.01	617.43	1.39E-02
Dryer	2.47	1.05	0.02	0.22	0.22	0.22	0.16	721.02	5.55E-02
Total	5.31	11.92	2.19	2.06	1.14	0.56	4.75	1,955.87	0.08

Table 1.d. Summary of Potential Controlled Emissions in Tons Per Year

Emissions Source	Controlled Emissions, tons/year								
	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}	VOC	CO ₂ e	HAPs
Primary Ore Crushing	-	-	-	3.15	1.48	0.22	-	-	-
Secondary Ore Crushing	-	-	-	0.58	0.22	0.03	-	-	-
Ore Sorting	-	-	-	0.62	0.24	0.04	-	-	-
Tertiary Ore Crushing	-	-	-	0.89	0.28	0.04	-	-	-
Concentrator and Tailings	-	-	-	1.27	0.57	0.09	-	-	-
Bag Filters	-	-	-	0.51	0.19	0.03	-	-	-
Reagent Usage	-	-	-	-	-	-	20.00	-	-
Emergency Generator Engine	0.35	1.36	0.27	0.03	0.03	0.03	2.95E-03	154.36	3.48E-03
Emergency Firewater Pump Engine	0.35	1.36	0.27	0.03	0.03	0.03	2.95E-03	154.36	3.48E-03
Dryer	10.82	4.60	0.08	0.98	0.98	0.98	0.71	3,158.05	2.42E-01
Total	11.53	7.32	0.62	8.06	4.02	1.49	20.71	3,466.76	0.25

Table 1.e. Summary of Actual Controlled Emissions in Pounds Per Hour

Emissions Source	Controlled Emissions, lb/hr								
	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}	VOC	CO ₂ e	HAPs
Primary Ore Crushing	-	-	-	0.72	0.34	0.05	-	-	-
Secondary Ore Crushing	-	-	-	0.13	0.05	0.01	-	-	-
Ore Sorting	-	-	-	0.14	0.06	0.01	-	-	-
Tertiary Ore Crushing	-	-	-	0.20	0.06	0.01	-	-	-
Concentrator and Tailings	-	-	-	0.29	0.13	0.02	-	-	-
Bag Filters	-	-	-	0.12	0.04	0.01	-	-	-
Reagent Usage	-	-	-	-	-	-	2.74	-	-
Emergency Generator Engine	1.42	5.44	1.09	0.12	0.12	0.12	0.01	617.43	1.39E-02
Emergency Fire Pump Engine	1.42	5.44	1.09	0.12	0.12	0.12	0.01	617.43	1.39E-02
Dryer	2.47	1.05	0.02	0.22	0.22	0.22	0.16	721.02	5.55E-02
Total	5.31	11.92	2.19	2.06	1.14	0.56	2.93	1,955.87	0.08

Table 1.f. Summary of Actual Controlled Emissions in Tons Per Year

Emissions Source	Controlled Emissions, tons/year								
	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}	VOC	CO ₂ e	HAPs
Primary Ore Crushing	-	-	-	2.10	0.99	0.15	-	-	-
Secondary Ore Crushing	-	-	-	0.39	0.15	0.02	-	-	-
Ore Sorting	-	-	-	0.42	0.16	0.02	-	-	-
Tertiary Ore Crushing	-	-	-	0.60	0.19	0.03	-	-	-
Concentrator and Tailings	-	-	-	1.07	0.48	0.07	-	-	-
Bag Filters	-	-	-	0.51	0.19	0.03	-	-	-
Reagent Usage	-	-	-	-	-	-	12.00	-	-
Emergency Generator Engine	0.35	1.36	0.27	0.03	0.03	0.03	2.95E-03	154.36	3.48E-03
Emergency Fire Pump Engine	0.35	1.36	0.27	0.03	0.03	0.03	2.95E-03	154.36	3.48E-03
Dryer	10.82	4.60	0.08	0.98	0.98	0.98	0.71	3,158.05	2.42E-01
Total	11.53	7.32	0.62	6.11	3.19	1.36	12.71	3,466.76	0.25

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
HAP Emissions Summary

Table 1.g. Summary of HAP Emissions

Pollutant	Dryer (ES-039)		Emergency Generator (IES-110)		Emergency Fire Pump Engine (IES-111)		Diesel Storage Tanks (IES-001,002,003,004,006)		Total HAPs	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
1,3-Butadiene			1.47E-04	3.67E-05	1.47E-04	3.67E-05			2.93E-04	7.34E-05
Acetaldehyde			2.88E-03	7.19E-04	2.88E-03	7.19E-04			5.76E-03	1.44E-03
Acrolein			3.47E-04	8.68E-05	3.47E-04	8.68E-05			6.94E-04	1.74E-04
Anthracene	7.06E-08	3.09E-07							7.06E-08	3.09E-07
Benzene	6.18E-05	2.71E-04	3.50E-03	8.75E-04	3.50E-03	8.75E-04			7.06E-03	2.02E-03
Benzo(a)pyrene	3.53E-08	1.55E-07	7.05E-07	1.76E-07	7.05E-07	1.76E-07			1.45E-06	5.07E-07
Dichlorobenzene	3.53E-05	1.55E-04							3.53E-05	1.55E-04
Formaldehyde	2.21E-03	9.66E-03	4.43E-03	1.11E-03	4.43E-03	1.11E-03			1.11E-02	1.19E-02
Hexane	5.29E-02	2.32E-01					2.99E-01	1.97E-02	3.52E-01	2.52E-01
Naphthalene	1.79E-05	7.86E-05							1.79E-05	7.86E-05
Toluene	1.00E-04	4.38E-04	1.53E-03	3.84E-04	1.53E-03	3.84E-04			3.17E-03	1.21E-03
Xylenes			1.07E-03	2.67E-04	1.07E-03	2.67E-04			2.14E-03	5.35E-04
Maximum Single HAP (Hexane)	0.05	0.23					0.30	0.02	0.35	0.25
Total HAPs	0.06	0.24	0.01	0.00	0.01	0.00	0.30	0.02	0.38	0.27

Note: All VOC from diesel tanks is conservatively assumed to be hexane since that is the maximum HAP emitted from the other processes.

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Primary Crushing

Table 2.a. Uncontrolled Ore Crushing and Processing Emissions

Emission Source	Emission Source	Method of Control	Emission Point	Emission Category ^{1, 2}	Hourly Capacity tons/hr	PTE Operating Hours	Projected Operating Hours	PTE Throughput tons/year	Projected Throughput tons/year	Capture Efficiency	PM					PM ₁₀					PM _{2.5}																
											Emission Factor lb/ton	Uncontrolled PTE Emissions ^{3, 4} lb/hr	Controlled PTE Emissions ^{3, 4} lb/hr	Uncontrolled Projected Emissions ^{3, 4} lb/hr tpy	Controlled Emissions ^{3, 4} lb/hr tpy	Emission Factor lb/ton	Uncontrolled PTE Emissions ^{3, 4} lb/hr	Controlled PTE Emissions ^{3, 4} lb/hr	Uncontrolled Projected Emissions ^{3, 4} lb/hr tpy	Controlled Emissions ^{3, 4} lb/hr tpy	Emission Factor lb/ton	Uncontrolled PTE Emissions ^{3, 4} lb/hr	Controlled PTE Emissions ^{3, 4} lb/hr	Uncontrolled Projected Emissions ^{3, 4} lb/hr tpy	Controlled Emissions ^{3, 4} lb/hr tpy												
ROM Truck Unloading Area	ES-029	N/A	EP-029	Drop Operations	556	8,760	5,843	4,870,560	3,248,664		1.24E-03	0.69	3.02	0.69	3.02	0.69	2.01	0.69	2.01	5.86E-04	0.33	1.43	0.33	1.43	0.33	0.95	0.33	0.95	8.87E-05	4.93E-02	2.16E-01	4.93E-02	2.16E-01	4.93E-02	1.44E-01	1.44E-01	
Apron Feeder Conveyor	ES-028a	CD-028 Primary Crusher Baghouse	EP-028	Conveyor Transfer Point	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	3.84E-03	0.01	1.92E-04	5.60E-04
Vibrating Grizzly	ES-028b	CD-028 Primary Crusher Baghouse	EP-028	Screening	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	3.84E-03	0.01	1.92E-04	5.60E-04
Primary Jaw Crusher	ES-028c	CD-028 Primary Crusher Baghouse	EP-028	Crushing	292	8,760	5,843	2,557,920	1,706,133	95%	1.20E-03	0.35	1.53	0.02	0.08	0.35	1.02	0.02	0.05	5.40E-04	0.16	0.69	0.01	0.03	0.16	0.46	0.01	0.02	8.10E-05	0.02	0.10	1.18E-03	0.01	0.02	0.07	1.18E-03	3.45E-03
Sacrificial Conveyor	ES-028d	CD-028 Primary Crusher Baghouse	EP-028	Conveyor Transfer Point	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	0.00	0.01	1.92E-04	5.60E-04
Total												1.27	5.58	0.72	3.15	1.27	3.72	0.72	2.10		0.56	2.45	0.34	1.48	0.56	1.64	0.34	0.99		0.08	0.37	0.05	0.22	0.08	0.25	0.05	0.15

¹ Crushing, screening, and conveyor transfer points emissions are taken from AP-42, Table 11.19.2-2. Wherever PM₁₀ emission factors are not available, they are assumed to be 15% of PM_{2.5} emission factors. The ore material naturally contains 5% by weight moisture. Based on AP-42 Chapter 11.19-1 "high" moisture material is considered >1.5%. Therefore, the controlled emission factors contained with Table 11.19.2-2 have been used to estimate PTE emissions.

² Emission factors for drop operations calculated using equation 1 of AP-42 Chapter 13.2.4 - Aggregate Handling and Storage Piles.

³ Emissions (lb/hr) = Mill Maximum Hourly Throughput (tons/yr) x Emission Factor (lb/ton)

⁴ Emissions (ton/yr) = Mill Maximum Annual Throughput (ton/yr) x Emission Factor (lb/ton) x Conversion Factor (1 ton / 2,000 lb)

⁵ The sorters do vibrate but use x-ray sensors to sort the material. Sorter emissions have been characterized as a Drop and series of three conveyors (Belt Conveyor, Vibrating Belt Feeder, and Conveyor Belt).

⁶ The Coarse High Intensity Magnetic Separator #1/#2 consist of three internal permiolls (or conveyors with magnetic head pulleys) and have been characterized as a drop and series of three conveyors .

$$E \left(\frac{\text{lb}}{\text{ton}} \right) = k (0.0032) \times \left(\frac{U}{1.5} \right)^{1.3}$$

Where:

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless)

U = mean wind speed (mph) *

M = material moisture content (%)

* Note that the mean wind speed (U) was assumed to be the average of the range of source conditions for Equation 1. (EPA AP-42 November 2006, Chapter 13.2.4)

5% Moisture Content:		
PM Emission Factor	PM ₁₀ Emission Factor	PM _{2.5} Emission Factor
1.24E-03 lb/ton	5.86E-04 lb/ton	8.87E-05 lb/ton
0.74	0.35	0.053
8.15 mph	8.15 mph	8.15 mph
5.0 %	5.0 %	5.0 %

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Secondary Crushing

Table 3.b. Uncontrolled Ore Crushing and Processing Emissions

Emission Source	Emission Source	Method of Control	Emission Point	Emission Category ^{1,2}	Hourly Capacity tons/hr	PTE Operating Hours	Projected Throughput tons/year	PTE Throughput tons/year	Capture Efficiency	PM								PM ₁₀								PM _{2.5}											
										Emission Factor lb/hr	Uncontrolled PTE Emissions ^{3,4} tpy	Controlled PTE Emissions ^{3,4} tpy	Uncontrolled Projected Emissions ^{3,4} tpy	Controlled Emissions ^{3,4} tpy	Emission Factor lb/hr	Uncontrolled PTE Emissions ^{3,4} tpy	Controlled PTE Emissions ^{3,4} tpy	Uncontrolled Projected Emissions ^{3,4} tpy	Controlled Emissions ^{3,4} tpy	Emission Factor lb/hr	Uncontrolled PTE Emissions ^{3,4} tpy	Controlled PTE Emissions ^{3,4} tpy	Uncontrolled Projected Emissions ^{3,4} tpy	Controlled Emissions ^{3,4} tpy	Emission Factor lb/hr	Uncontrolled PTE Emissions ^{3,4} tpy	Controlled PTE Emissions ^{3,4} tpy	Uncontrolled Projected Emissions ^{3,4} tpy	Controlled Emissions ^{3,4} tpy								
Scalping Screen Feed Conveyor #1	ES-027	CD-023 Secondary Crusher Baghouse	EP-023	Conveyor Transfer Point	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	3.84E-03	0.01	1.92E-04	5.60E-04
Scalping Screen Feed Conveyor #2	ES-026	CD-023 Secondary Crusher Baghouse	EP-023	Conveyor Transfer Point	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	3.84E-03	0.01	1.92E-04	5.60E-04
Scalping Screen Feed Conveyor #3	ES-023a	CD-023 Secondary Crusher Baghouse	EP-023	Conveyor Transfer Point	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	3.84E-03	0.01	1.92E-04	5.60E-04
Scalping Screen	ES-023b	CD-023 Secondary Crusher Baghouse	EP-023	Screening	556	8,760	5,843	4,870,560	3,248,664	95%	2.20E-03	1.22	5.36	0.06	0.27	1.22	3.57	0.06	0.18	7.40E-04	0.41	1.80	0.02	0.09	0.41	1.20	0.02	0.06	1.11E-04	0.06	0.27	1.09E-03	0.01	0.06	0.18	3.09E-03	0.01
Secondary Crusher Feed Bin	ES-023c	CD-023 Secondary Crusher Baghouse	EP-023	Drop Operations	400	8,760	5,843	3,504,000	2,337,168	95%	1.24E-03	0.50	2.17	0.02	0.11	0.50	1.45	0.02	0.07	5.86E-04	0.23	1.03	0.01	0.05	0.23	0.68	0.01	0.03	8.87E-05	0.04	0.16	1.77E-03	0.03	0.04	0.10	1.77E-03	0.01
Secondary Crusher Belt Feeder	ES-023d	CD-023 Secondary Crusher Baghouse	EP-023	Conveyor Transfer Point	400	8,760	5,843	3,504,000	2,337,168	95%	1.40E-04	0.06	0.25	2.80E-03	0.01	0.06	0.16	2.80E-03	0.01	4.60E-05	0.02	0.08	9.20E-04	4.03E-03	0.02	0.05	9.20E-04	2.69E-03	6.90E-06	2.76E-03	0.01	1.38E-04	6.04E-04	2.76E-03	0.01	1.38E-04	4.03E-04
Secondary Cone Crusher	ES-023e	CD-023 Secondary Crusher Baghouse	EP-023	Crushing	400	8,760	5,843	3,504,000	2,337,168	95%	1.20E-03	0.48	2.10	0.02	0.11	0.48	1.40	0.02	0.07	5.40E-04	0.22	0.95	0.01	0.05	0.22	0.63	0.01	0.03	8.10E-05	0.03	0.14	1.62E-03	0.01	0.03	0.09	1.62E-03	4.73E-03
Sorting Screen Feed Conveyor #1	ES-023f	CD-023 Secondary Crusher Baghouse	EP-023	Conveyor Transfer Point	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	3.84E-03	0.01	1.92E-04	5.60E-04
Sorting Screen Feed Conveyor #2	ES-023g	CD-023 Secondary Crusher Baghouse	EP-023	Conveyor Transfer Point	556	8,760	5,843	4,870,560	3,248,664	95%	1.40E-04	0.08	0.34	3.89E-03	0.02	0.08	0.23	3.89E-03	0.01	4.60E-05	0.03	0.11	1.28E-03	0.01	0.03	0.07	1.28E-03	3.74E-03	6.90E-06	3.84E-03	0.02	1.92E-04	8.40E-04	3.84E-03	0.01	1.92E-04	5.60E-04
Total											2.64	11.58	0.13	0.58	2.64	7.72	0.13	0.39		1.01	4.42	0.22	1.01	2.95	0.05	0.15		0.15	0.66	0.01	0.03	0.15	0.44	0.01	0.02		

¹Crushing, screening, and conveyor transfer points emissions are taken from AP-42, Table 11.19.2-2. Whenever PM₁₀ emission factors are not available, they are assumed to be 35% of PM_{2.5} emission factors. The ore material naturally contains 5% by weight moisture. Based on AP-42 Chapter 11.19.1 "high" moisture material is considered >1.5%. Therefore, the controlled emission factors contained with Table 11.19.2-2 have been used to estimate PTE emissions.

²Emission factors for drop operations calculated using equation 1 of AP-42 Chapter 12.2.4 - Aggregate Handling and Storage Piles.

³Emissions (lb/hr) = Mill Maximum Hourly Throughput (tons/hr) x Emission Factor (lb/ton)

⁴Emissions (ton/yr) = Mill Maximum Annual Throughput (ton/yr) x Emission Factor (lb/ton) x Conversion Factor (1 ton / 2,000 lb)

⁵The sorters do vibrate but use x-ray sensors to sort the material. Sorter emissions have been characterized as a Drop and series of three conveyors (Belt Conveyor, Vibrating Belt Feeder, and Conveyor Belt).

⁶The Gause High Intensity Magnetic Separator #2/#3 consist of three internal permeable (or conveyors with magnetic head pulleys) and have been characterized as a drop and series of three conveyors.

Where:
$$E \left(\frac{\text{lb}}{\text{ton}} \right) = k (0.0032) \left(\frac{U}{U_m} \right)^{1.3}$$

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless)

U = mean wind speed (mph) *

M = material moisture content (%)

* Note that the mean wind speed (U) was assumed to be the average of the range of source conditions for Equation 1. (EPA AP-42 November 2006, Chapter 12.2.4)

5% Moisture Content		
PM Emission Factor	PM ₁₀ Emission Factor	PM _{2.5} Emission Factor
1.24E-03 lb/ton	5.86E-04 lb/ton	8.87E-05 lb/ton
0.74	0.35	0.093
8.15 mph	8.15 mph	8.15 mph
1.0 %	5.0 %	5.0 %

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Sorting

Table 4.c. **Uncontrolled Ore Crushing and Processing Emissions**

Emission Source	Emission Source	Method of Control	Emission Point	Emission Category 1-2	Hourly Capacity tons/hr	PTE Operating Hours	Projected Operating Hours	PTE Throughput tons/year	Projected Throughput tons/year	Capture Efficiency	PM								PM ₁₀								PM _{2.5}											
											Uncontrolled				Controlled				Uncontrolled				Controlled				Uncontrolled				Controlled							
											Factor	Emissions 1-2 lb/ton	Emissions 1-2 lb/hr	Emissions 1-2 tpy	Factor	Emissions 1-2 lb/ton	Emissions 1-2 lb/hr	Emissions 1-2 tpy	Factor	Emissions 1-2 lb/ton	Emissions 1-2 lb/hr	Emissions 1-2 tpy	Factor	Emissions 1-2 lb/ton	Emissions 1-2 lb/hr	Emissions 1-2 tpy	Factor	Emissions 1-2 lb/ton	Emissions 1-2 lb/hr	Emissions 1-2 tpy	Factor	Emissions 1-2 lb/ton	Emissions 1-2 lb/hr	Emissions 1-2 tpy				
Sorting Sizing Screen	ES-020a	CD-020 Sorter Sizing Screen Baghouse	EP-020	Screening	856	8,760	5,843	4,870,560	1,248,664	95%	2.08E-03	1.22	3.36	0.06	0.27	1.22	3.37	0.06	0.18	7.49E-04	0.41	1.80	0.03	0.09	0.41	1.20	0.02	0.06	1.11E-04	0.06	0.27	0.01	0.01	0.06	0.18	0.01		
Coarse Sorting Conveyor	ES-020b	CD-020 Sorter Sizing Screen Baghouse	EP-020	Conveyor Transfer Point	338	8,760	5,843	2,960,880	1,974,907	95%	1.40E-04	0.05	0.21	0.09	0.05	0.14	2.37E-03	0.01	4.60E-05	0.02	0.07	7.77E-04	1.41E-03	0.02	0.05	7.77E-04	2.27E-03	6.90E-06	1.33E-03	0.01	1.17E-04	5.31E-04	2.33E-03	0.00	1.17E-04	5.31E-04	2.33E-03	
Fine Sorting Conveyor	ES-020c	CD-020 Sorter Sizing Screen Baghouse	EP-020	Conveyor Transfer Point	444	8,760	5,843	1,261,440	841,380	95%	1.40E-04	0.02	0.09	1.01E-03	4.42E-03	0.02	0.06	1.01E-03	2.94E-03	4.60E-05	0.01	0.03	1.31E-04	1.45E-03	0.01	0.02	1.31E-04	9.68E-04	6.90E-06	9.94E-04	4.35E-03	4.97E-05	2.18E-04	9.94E-04	2.90E-03	4.97E-05	1.45E-04	
Sorting Bypass Conveyor #1	ES-021a	CD-018 Sorter Bypass Conveyor Baghouse	EP-018	Conveyor Transfer Point	72	8,760	5,843	630,720	430,090	95%	1.40E-04	0.01	0.04	1.04E-04	2.21E-03	0.01	0.03	1.04E-04	1.47E-03	4.60E-05	1.31E-03	0.01	1.66E-04	7.25E-04	0.01	1.66E-04	0.00	6.90E-06	4.97E-04	2.18E-03	2.48E-05	1.09E-04	4.97E-04	1.45E-03	2.48E-05	7.26E-05		
Sorting Bypass Conveyor #2	ES-021b	CD-018 Sorter Bypass Conveyor Baghouse	EP-018	Conveyor Transfer Point	72	8,760	5,843	630,720	430,090	95%	1.40E-04	0.01	0.04	1.04E-04	2.21E-03	0.01	0.03	1.04E-04	1.47E-03	4.60E-05	1.31E-03	0.01	1.66E-04	7.25E-04	0.01	1.66E-04	0.00	6.90E-06	4.97E-04	2.18E-03	2.48E-05	1.09E-04	4.97E-04	1.45E-03	2.48E-05	7.26E-05		
Coarse Sorter Bin	ES-018a	CD-018 Sorter Bypass Conveyor Baghouse	EP-018	Dump Operations	338	8,760	5,843	2,960,880	1,974,907	95%	1.24E-03	0.42	1.83	0.02	0.09	0.42	1.22	0.02	0.06	1.86E-04	0.20	0.87	0.01	0.04	0.20	0.18	0.01	0.03	8.87E-05	0.03	0.13	1.50E-03	0.01	0.03	0.09	1.50E-03	4.38E-03	
Belt Feeder - Coarse Sorter #1/2	ES-018b	CD-018 Sorter Bypass Conveyor Baghouse	EP-018	Conveyor Transfer Point	338	8,760	5,843	2,960,880	1,974,907	95%	1.40E-04	0.05	0.21	2.37E-03	0.01	0.05	0.14	2.37E-03	0.01	4.60E-05	0.02	0.07	7.77E-04	1.41E-03	0.02	0.05	7.77E-04	2.27E-03	6.90E-06	1.33E-03	0.01	1.17E-04	5.31E-04	2.33E-03	0.00	1.17E-04	5.31E-04	2.33E-03
Fine Sorter Bin	ES-018c	CD-018 Sorter Bypass Conveyor Baghouse	EP-018	Dump Operations	444	8,760	5,843	1,261,440	841,380	95%	1.24E-03	0.18	0.78	0.01	0.04	0.18	0.52	0.01	0.03	1.86E-04	0.08	0.37	0.22E-03	0.02	0.08	0.25	4.22E-03	0.01	8.87E-05	0.01	0.06	6.39E-04	2.80E-03	0.01	0.04	6.39E-04	1.87E-03	
Coarse Sorter #1/2 6	ES-018a	CD-018 Ore Sorting Baghouse	EP-018	Dump Operations	338	8,760	5,843	2,960,880	1,974,907	95%	1.24E-03	0.42	1.83	0.02	0.09	0.42	1.22	0.02	0.06	1.86E-04	0.20	0.87	0.01	0.04	0.20	0.18	0.01	0.03	8.87E-05	0.03	0.13	1.50E-03	0.01	0.03	0.09	1.50E-03	4.38E-03	
	ES-018b	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	338	8,760	5,843	2,960,880	1,974,907	95%	1.40E-04	0.05	0.21	2.37E-03	0.01	0.05	0.14	2.37E-03	0.01	4.60E-05	0.02	0.07	7.77E-04	1.41E-03	0.02	0.05	7.77E-04	2.27E-03	6.90E-06	1.33E-03	0.01	1.17E-04	5.31E-04	2.33E-03	0.00	1.17E-04	5.31E-04	2.33E-03
	ES-018c	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	338	8,760	5,843	2,960,880	1,974,907	95%	1.40E-04	0.05	0.21	2.37E-03	0.01	0.05	0.14	2.37E-03	0.01	4.60E-05	0.02	0.07	7.77E-04	1.41E-03	0.02	0.05	7.77E-04	2.27E-03	6.90E-06	1.33E-03	0.01	1.17E-04	5.31E-04	2.33E-03	0.00	1.17E-04	5.31E-04	2.33E-03
	ES-018d	CD-018 Ore Sorting Baghouse	EP-018	Dump Operations	444	8,760	5,843	1,261,440	841,380	95%	1.24E-03	0.18	0.78	0.01	0.04	0.18	0.52	0.01	0.03	1.86E-04	0.08	0.37	0.22E-03	0.02	0.08	0.25	4.22E-03	0.01	8.87E-05	0.01	0.06	6.39E-04	2.80E-03	0.01	0.04	6.39E-04	1.87E-03	
	ES-018e	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	444	8,760	5,843	1,261,440	841,380	95%	1.40E-04	0.02	0.09	1.01E-03	4.42E-03	0.02	0.06	1.01E-03	2.94E-03	4.60E-05	0.01	0.03	1.31E-04	1.45E-03	0.01	0.02	1.31E-04	9.68E-04	6.90E-06	9.94E-04	4.35E-03	4.97E-05	2.18E-04	9.94E-04	2.90E-03	4.97E-05	1.45E-04	
Fine Sorter #1/2 5	ES-018a	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	338	8,760	5,843	2,960,880	1,974,907	95%	1.40E-04	0.05	0.21	2.37E-03	0.01	0.05	0.14	2.37E-03	0.01	4.60E-05	0.02	0.07	7.77E-04	1.41E-03	0.02	0.05	7.77E-04	2.27E-03	6.90E-06	1.33E-03	0.01	1.17E-04	5.31E-04	2.33E-03	0.00	1.17E-04	5.31E-04	2.33E-03
	ES-018b	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	338	8,760	5,843	2,960,880	1,974,907	95%	1.40E-04	0.05	0.21	2.37E-03	0.01	0.05	0.14	2.37E-03	0.01	4.60E-05	0.02	0.07	7.77E-04	1.41E-03	0.02	0.05	7.77E-04	2.27E-03	6.90E-06	1.33E-03	0.01	1.17E-04	5.31E-04	2.33E-03	0.00	1.17E-04	5.31E-04	2.33E-03
	ES-018c	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	338	8,760	5,843	2,960,880	1,974,907	95%	1.40E-04	0.05	0.21	2.37E-03	0.01	0.05	0.14	2.37E-03	0.01	4.60E-05	0.02	0.07	7.77E-04	1.41E-03	0.02	0.05	7.77E-04	2.27E-03	6.90E-06	1.33E-03	0.01	1.17E-04	5.31E-04	2.33E-03	0.00	1.17E-04	5.31E-04	2.33E-03
	ES-018d	CD-018 Ore Sorting Baghouse	EP-018	Dump Operations	444	8,760	5,843	1,261,440	841,380	95%	1.24E-03	0.18	0.78	0.01	0.04	0.18	0.52	0.01	0.03	1.86E-04	0.08	0.37	0.22E-03	0.02	0.08	0.25	4.22E-03	0.01	8.87E-05	0.01	0.06	6.39E-04	2.80E-03	0.01	0.04	6.39E-04	1.87E-03	
	ES-018e	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	444	8,760	5,843	1,261,440	841,380	95%	1.40E-04	0.02	0.09	1.01E-03	4.42E-03	0.02	0.06	1.01E-03	2.94E-03	4.60E-05	0.01	0.03	1.31E-04	1.45E-03	0.01	0.02	1.31E-04	9.68E-04	6.90E-06	9.94E-04	4.35E-03	4.97E-05	2.18E-04	9.94E-04	2.90E-03	4.97E-05	1.45E-04	
Sorter Bypass Conveyor	ES-018	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	38	8,760	7,446	924,480	738,708	95%	1.40E-04	0.01	0.06	1.86E-04	1.00E-03	0.01	0.05	6.86E-04	3.55E-03	4.60E-05	4.63E-03	0.02	7.55E-04	1.697E-04	1.45E-03	0.02	7.55E-04	8.29E-04	6.90E-06	1.76E-04	3.96E-03	3.96E-03	1.48E-04	6.76E-04	2.12E-03	3.96E-03	1.24E-04	
Sorting Counting Field Conveyor	ES-018	CD-018 Ore Sorting Baghouse	EP-018	Conveyor Transfer Point	413	8,760	5,843	3,617,880	1,413,126	95%	1.40E-04	0.06	0.25	3.89E-03	0.01	0.06	0.17	3.89E-03	0.01	4.60E-05	0.02	0.06	9.50E-04	4.16E-03	0.02	0.06	9.50E-04	2.78E-03	6.90E-06	3.80E-03	0.01	1.43E-04	6.24E-04	2.85E-03	0.01	1.43E-04	6.24E-04	2.85E-03

¹ Crushing, screening, and conveyor transfer points emissions are taken from AP-42, Table 11.10.2-2. Whenever PM₁₀ emission factors are not available, they are assumed to be 10% of PM_{2.5} emission factors. The ore material naturally contains 1% weight moisture. Based on AP-42 Chapter 11.10.2-1 "high" moisture material is considered <1.5%. Therefore, the controlled emission factors combined with Table 11.10.2-2 have been used to estimate PTE emissions.

² Emission factor for drop operations calculated using equation 1 of AP-42 Chapter 13.2.4 - Aggregate Handling and Storage Piles.

³ Emissions (lb/hr) = 600 Maximum Annual Throughput (tons/yr) x Emission Factor (lb/ton)

⁴ Emissions (ton/yr) = 600 Maximum Annual Throughput (tons/yr) x Conversion Factor (1 ton / 2,000 lb)

⁵ The values of lb/yds are but use very sensitive to sort the material. Sorter emissions have been characterized as a Drop and series of three conveyors (Belt Conveyor, Vibrating Belt Feeder, and Conveyor Belt).

⁶ The Capture Efficiency Multiplier (CEM) is equal to the sum of three capture efficiencies for conveyors with magnetic head pulleys and have been characterized as a drop and series of three conveyors.

$$E \left(\frac{\text{lb}}{\text{hr}} \right) = 4.3 (6032)^{\frac{1}{2}} \left(\frac{Q}{40} \right)^{\frac{1}{2}}$$

Where:

E = emission factor (lb/hr)

Q = particle size multiplier (micrometers)

U = mean wind speed (mph)

Q = measured moisture content (%)

⁷ Note that the mean wind speed (U) was assumed to be the average of the range of source conditions (for Equation 1, EPA AP-42 November 2006, Chapter 12.4)

SO ₂ Moisture Content			
PM Emission Factor	PM ₁₀ Emission Factor	PM _{2.5} Emission Factor	
1.86E-03 lb/ton	1.86E-04 lb/ton	8.8E-05 lb/ton	
0.14	0.15	0.003	
8.15 mg/h	8.15 mg/h	8.15 mg/h	
0.0 %	0.0 %	0.0 %	

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Tertiary Crushing

Table S-6. Uncontrolled Ore Crushing and Processing Emissions

Emission Source	Emission Source	Method of Control	Emission Point	Emission Category ^{1,2}	Hourly Capacity	PTE Operating Hours	Projected Operating Hours	PTE Throughput	Projected Throughput	Capture Efficiency	PM								PM ₁₀								PM _{2.5}													
											Emission Factor		Uncontrolled PTE Emissions ^{1,4}		Controlled PTE Emissions ^{1,4}		Uncontrolled Projected Emissions ^{1,4}		Controlled Emissions ^{1,4}		Emission Factor		Uncontrolled PTE Emissions ^{1,4}		Controlled PTE Emissions ^{1,4}		Uncontrolled Projected Emissions ^{1,4}		Controlled Emissions ^{1,4}		Emission Factor		Uncontrolled PTE Emissions ^{1,4}		Controlled PTE Emissions ^{1,4}		Uncontrolled Projected Emissions ^{1,4}		Controlled Emissions ^{1,4}	
											lb/ton	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/ton	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/ton	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Tertiary Crusher Sizing Screens	ES-022a8a	CO-022 Tertiary Sizing Screen Baghouse	EP-022	Screening	1,284	8,760	5,843	11,241,840	7,502,309	95%	2.20E-03	2.82	12.37	0.14	0.62	2.82	8.25	0.14	0.41	5.86E-04	0.75	3.30	0.04	0.16	0.75	0.20	0.04	0.11	4.87E-05	0.11	0.50	0.01	0.02	0.11	0.33	0.01	0.02			
Tertiary Crushing Feed Bin Conveyor	ES-022c	CO-022 Tertiary Sizing Screen Baghouse	EP-022	Conveyor Transfer Point	413	8,760	5,843	3,617,880	2,413,126	95%	1.40E-04	0.06	0.25	0.00	0.01	0.06	0.17	2.89E-03	0.01	4.60E-05	0.02	0.08	9.50E-04	4.16E-03	0.02	0.06	9.50E-04	2.78E-03	6.90E-06	2.81E-03	0.01	1.42E-04	6.24E-04	2.83E-03	0.01	1.42E-04	4.16E-04			
Stockpile Feed Conveyor #1	ES-031	CO-022 Tertiary Sizing Screen Baghouse	EP-022	Conveyor Transfer Point	458	8,760	7,008	4,012,080	3,209,664	95%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	4.60E-05	0.02	0.09	1.05E-03	4.61E-03	0.02	0.07	1.05E-03	3.69E-03	6.90E-06	3.16E-03	0.01	1.58E-04	6.92E-04	3.16E-03	0.01	1.58E-04	5.54E-04			
Tertiary Crusher Feed Bin	ES-021a	CO-021 Tertiary Crusher Baghouse	EP-021	Drop Operations	413	8,760	5,843	3,617,880	2,413,126	95%	1.24E-03	0.51	2.24	0.01	0.11	0.51	1.50	0.03	0.07	3.86E-04	0.24	1.06	0.01	0.05	0.24	0.71	0.01	0.04	4.87E-05	0.04	0.16	1.83E-03	0.01	0.04	0.11	1.83E-03	0.01			
Belt feeder - Tertiary Crusher #1/#2	ES-021b8a	CO-021 Tertiary Crusher Baghouse	EP-021	Conveyor Transfer Point	413	8,760	5,843	3,617,880	2,413,126	95%	1.40E-04	0.06	0.25	2.89E-03	0.01	0.06	0.17	2.89E-03	0.01	4.60E-05	0.02	0.08	9.50E-04	4.16E-03	0.02	0.06	9.50E-04	2.78E-03	6.90E-06	2.81E-03	0.01	1.42E-04	6.24E-04	2.83E-03	0.01	1.42E-04	4.16E-04			
Tertiary Cone Crusher #1/#2	ES-021b8a	CO-021 Tertiary Crusher Baghouse	EP-021	Crushing	413	8,760	5,843	3,617,880	2,413,126	95%	1.20E-03	0.50	2.17	0.02	0.11	0.50	1.45	0.02	0.07	3.40E-04	0.22	0.98	0.01	0.05	0.22	0.65	0.01	0.03	8.10E-05	0.03	0.15	1.67E-03	0.01	0.03	0.10	1.67E-03	4.89E-03			
Tertiary Crusher Product Conveyor	ES-021f	CO-021 Tertiary Crusher Baghouse	EP-021	Conveyor Transfer Point	413	8,760	5,843	3,617,880	2,413,126	95%	1.40E-04	0.06	0.25	2.89E-03	0.01	0.06	0.17	2.89E-03	0.01	4.60E-05	0.02	0.08	9.50E-04	4.16E-03	0.02	0.06	9.50E-04	2.78E-03	6.90E-06	2.81E-03	0.01	1.42E-04	6.24E-04	2.83E-03	0.01	1.42E-04	4.16E-04			
Total											4.07	17.83	0.20	0.89	4.07	11.93	0.20	0.60	1.30	3.67	0.06	0.28	1.30	1.80	0.06	0.19	9.86	0.20	0.86	0.20	0.64	0.20	0.67	0.01	1.30					

¹Crushing, screening, and conveyor transfer points emissions are taken from AP-42, Table 11.19.2-2. Whenever PM_{2.5} emission factors are not available, they are assumed to be 15% of PM₁₀ emission factors. The ore material naturally contains 5% by weight moisture. Based on AP-42 Chapter 11.19-1 "High" moisture material is considered <1.5%. Therefore, the controlled emission factors contained with Table 11.19.2-2 have been used to estimate PTE emissions.

²Emission factors for drop operations calculated using equation 1 of AP-42 Chapter 13.2-4 - Aggregate Handling and Storage Piles.

³Emissions (lb/hr) = MHI Maximum Hourly Throughput (ton/hr) x Emission Factor (lb/ton)

⁴Emissions (ton/yr) = MHI Maximum Annual Throughput (ton/yr) x Emission Factor (lb/ton) x Conversion Factor (1 ton / 2,000 lb)

⁵The values do vibrate but use a v-ray sensors to sort the material. Sorter emissions have been characterized as a drop and series of three conveyors (Belt Conveyor, Vibrating Belt Feeder), and Conveyor Belt).

⁶The Coarse High Intensity Magnetic Separator #1/#2 consist of three internal perennials (or conveyors with magnetic head pulleys)and have been characterized as a drop and series of three conveyors.

$$E \left(\frac{\text{lb}}{\text{hr}} \right) = A(0.0032) \times \left(\frac{Q}{d} \right)^{1.5}$$

Where:

E = emission factor (lb/hr)

A = particle size multiplier (dimensionless)

Q = mean wind speed (mph)*

M = material moisture content (%)

*Note that the mean wind speed (Q) was assumed to be the average of the range of source conditions for Equation 1. (BPA-AP-42 November 2006, Chapter 13.2-4)

5% Moisture Content		
PM Emission Factor	PM ₁₀ Emission Factor	PM _{2.5} Emission Factor
1.24E-03 lb/ton	5.86E-04 lb/ton	8.81E-05 lb/ton
0.74	0.35	0.053
8.15 mph	8.15 mph	8.15 mph
5.0 %	5.0 %	5.0 %

Concentrator and Tailings:

Table 6.e. Uncontrolled Ore Crushing and Processing Emissions

Emission Source	Emission Source	Method of Control	Emission Control	Emission Category ^{1,2}	Hourly Capacity t/hr	PM ₁₀ Operating Hours t/yr	Projected Throughput t/yr	Projected Throughput t/yr	Capture Efficiency %	PM ₁₀		PM _{2.5}		PM ₁₀		PM _{2.5}		PM ₁₀		PM _{2.5}		PM ₁₀		PM _{2.5}		
										Uncontrolled Emissions t/yr	Controlled Emissions t/yr	Uncontrolled Emissions t/yr	Controlled Emissions t/yr	Uncontrolled Emissions t/yr	Controlled Emissions t/yr	Uncontrolled Emissions t/yr	Controlled Emissions t/yr	Uncontrolled Emissions t/yr	Controlled Emissions t/yr	Uncontrolled Emissions t/yr	Controlled Emissions t/yr					
Stockpile Feed Conveyor #2	ES-035	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Stockpile Stocking Conveyor	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Stockpile Stocking Conveyor #2	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #1/2	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #2	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #3	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #4	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #5	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #6	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #7	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #8	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #9	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #10	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #11	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #12	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #13	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #14	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #15	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #16	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #17	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #18	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #19	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #20	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #21	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #22	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #23	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #24	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #25	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #26	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #27	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #28	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #29	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #30	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #31	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #32	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #33	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #34	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #35	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #36	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #37	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #38	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point	458	8,760	7,008	4,012,000	3,209,664	99%	1.40E-04	0.06	0.28	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03	0.01	0.06	0.22	3.21E-03
Plant Feed Belt Feeder #39	ES-040	CD-003 Stockpile String Screen Baghouse	EP-040	Conveyor Transfer Point																						

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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³ Coalbines, screening, and conveyor transfer points emissions are taken from AP-42, Table 11.19.2-2. Wherever PM₁₀ is emission² Emission factors for drop operations calculated using equation 1 of AP-42 Chapter 13.2.4 - Aggregate Handling and Storage Piles³ Emissions (lb/hr) = Mill Maximum Hourly Throughput (tons/hr) x Emission Factor (lb/ton)

^b The sorters do vibrate but use x-ray sensors to sort the material. Sorter emissions have been characterized as a group and series of three conveyors (Belt Conveyor, Vibrating Belt Feeder, and Conveyor Belt).

⁶ The Coarse High Intensity Magnetic Separator #1/#2 consist of three internal perimolds (or conveyors with magnetic head pulleys) and have been characterized as a drop and series of three conveyors.

$$E \left(\frac{lb}{\text{ton}} \right) = k(0.0032) \times \left(\frac{W}{S} \right)^{\frac{1}{4}} \left(\frac{M}{2} \right)$$

Witness

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless)

M = material moisture content (%)

* Note that the mean wind speed (U) was assumed to be the average of the range of source conditions for Equation 1. (EPA AP-42 November 2006, Chapter 13.2.4)

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Bag Filter Emissions

Table 7.a. Bag Filter Emissions

Emission Point	PTE of Associated Equipment			Capture Efficiency	Emissions Captured from Associated Equipment			Control Efficiency	Operating Hours	Bag Filter Emissions					
	PM	PM ₁₀	PM _{2.5}		PM	PM ₁₀	PM _{2.5}			PM		PM ₁₀		PM _{2.5}	
	(lb/hr)	(lb/hr)	(lb/hr)		(lb/hr)	(lb/hr)	(lb/hr)			(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
CD-016 Ore Sorting Baghouse	0.87	0.37	0.06	95%	0.83	0.35	0.05	99%	8,760	0.01	0.04	0.00	0.02	5.35E-04	2.34E-03
CD-018 Sorter Bypass Conveyor Baghouse	0.68	0.31	0.047	95%	0.65	2.96E-01	4.47E-02	99%	8,760	6.51E-03	2.85E-02	2.96E-03	1.30E-02	4.47E-04	1.96E-03
CD-020 Sorter Sizing Screen Baghouse	1.29	0.43	0.07	95%	1.23	0.41	0.06	99%	8,760	0.01	0.05	4.12E-03	0.02	6.18E-04	2.71E-03
CD-021 Tertiary Crusher Baghouse	1.12	0.50	0.08	95%	1.07	0.48	0.07	99%	8,760	0.01	0.05	4.78E-03	0.02	7.20E-04	3.15E-03
CD-022 Tertiary Crusher Sizing Screens Baghouse	2.95	0.79	0.12	95%	2.80	0.75	0.11	99%	8,760	0.03	0.12	0.01	0.03	1.14E-03	4.99E-03
CD-023 Secondary Crusher Baghouse	2.64	1.01	0.15	95%	2.51	0.96	0.14	99%	8,760	0.03	0.11	0.01	0.04	1.44E-03	0.01
CD-028 Primary Crusher Baghouse	0.58	0.23	0.04	95%	0.55	0.22	0.03	99%	8,760	0.01	0.02	2.23E-03	0.01	3.34E-04	1.46E-03
CD-039 DMS Dryer Baghouse	0.54	0.25	0.04	95%	0.52	0.24	0.04	99%	8,760	5.17E-03	2.27E-02	2.41E-03	1.06E-02	3.65E-04	1.60E-03
CD-040 Stockpile Sizing Screen Baghouse	0.87	0.37	0.06	95%	0.82	0.35	0.05	99%	8,760	8.23E-03	3.61E-02	3.48E-03	1.53E-02	5.26E-04	2.31E-03
CD-043 DMS and Mag Sep Baghouse	0.18	0.08	0.01	95%	0.17	0.07	0.01	99%	8,760	1.70E-03	7.46E-03	7.43E-04	3.26E-03	1.12E-04	4.92E-04
CD-005 Rail Load Out Bin Vent Filter	0.08	0.04	0.01	95%	0.07	0.03	0.01	99%	8,760	7.30E-04	3.20E-03	3.45E-04	1.51E-03	5.23E-05	2.29E-04
CD-012 Concentrate Load Out Bin Vent Filter	0.08	0.04	0.01	95%	0.07	0.03	0.01	99%	8,760	7.30E-04	3.20E-03	3.45E-04	1.51E-03	5.23E-05	2.29E-04
CD-013 Concentrate Load Out Bin Vent Filter	0.08	0.04	0.01	95%	0.07	0.03	0.01	99%	8,760	7.30E-04	3.20E-03	3.45E-04	1.51E-03	5.23E-05	2.29E-04
CD-024 Sorter Rejects Bin Vent Filter	0.12	0.06	0.01	95%	0.12	0.05	0.01	99%	8,760	1.15E-03	5.05E-03	5.46E-04	2.39E-03	8.26E-05	3.62E-04
CD-025 DMS Rejects Bin Vent Filter	0.10	0.05	0.01	95%	0.10	0.05	0.01	99%	8,760	9.53E-04	4.18E-03	4.51E-04	1.98E-03	6.83E-05	2.99E-04
Total										0.12	0.51	0.04	0.19	0.01	0.03

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Dryer Emissions (ES-039d)

Table 8.a. - Natural Gas-Fired Dryer

Parameter	Value	Units
Number of Units	1	
Heat Rating	30	MMBtu/hr
Maximum Monthly Gas Usage	21.88	MMSCF/month
Maximum Annual Gas Usage	257.65	MMSCF/yr
Hours per year/unit operated	8,760	hr/yr
Fuel heating value	1,020	Btu/scf

Table 8.b. - Natural Gas-Fired Dryer - Emissions

Pollutant	Default Emission Factors		Uncontrolled Emissions	
	(lb/10 ⁶ scf) ^{1, 2}	(lb/MMBtu) ³	(lb/hr)	(tons/year) ⁴
CO	84	0.082	2.47	10.82
NO _x	-	0.035	1.05	4.60
PM/PM ₁₀ /PM _{2.5} - Fuel Combustion	7.6	0.007	0.22	0.98
PM/PM ₁₀ /PM _{2.5} - Process Generated	Process generated emissions accounted for in Material Handling calculations			
SO ₂	0.6	0.001	0.02	0.08
VOC	5.5	0.005	0.16	0.71

¹ Emission factor for CO from AP-42 Chapter 1 Section 4 - Natural Gas Combustion Table 1.4-1 Emission Factors for Nitrogen Oxides (NO_x) and Carbon Monoxide (CO) From Natural Gas Combustion. Emission factor for NO_x is based on BACT for heaters rated greater than or equal to 10 MMBtu/hr.

² Emission factors for PM/PM₁₀/PM_{2.5}, SO₂, and VOC are from AP-42 Chapter 1 Section 4 - Natural Gas Combustion Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion.

³ To convert from lb/10⁶ scf to lb/MMBtu, the lb/10⁶ scf emission factors were then divided by 1,020 as specified in AP-42 Chapter 1.4, Table 1.4-2 footnote a.

⁴ Annual emissions are based on an operating schedule of 24 hours/day, 365 days/year (i.e., 8,760 hours/year).

Table 8.c. - Natural Gas-Fired Dryer - GHG emissions

GHG	Default Emission Factors	Uncontrolled Emissions	
	(kg/MMBtu) ^{1, 2}	(lb/hr)	(tons/year) ³
CO ₂	53.06	720.27	3,154.79
CH ₄	1.00E-03	1.36E-02	5.95E-02
N ₂ O	1.00E-04	1.36E-03	5.95E-03
CO ₂ e	-	721.02	3,158.05

¹ CO₂ emission factor obtained from 40 CFR 98 Subpart C, Table C-1 for natural gas.

² CH₄ and N₂O emission factors from 40 CFR 98 Subpart C, Table C-2 for natural gas.

³ Global warming potentials obtained from Table A-1 to Subpart 98 - Global Warming Potentials Equation A-1 CO₂e = ΣGHGi x GWPi

Where:

CO₂e = Carbon dioxide equivalent (tons/year)

GHGi = Mass emissions of each GHG (tons/year)

GWPi = Global warming potential for each GHG (1 for CO₂; 25 for CH₄; 298 for N₂O)

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Dryer Emissions (ES-039d)

Table 8.d. - Natural Gas-Fired Dryer - HAP emissions

HAP Pollutant	Default Emission Factors ¹		Uncontrolled Emissions	
	(lb/10 ⁶ scf)	(lb/MMBtu)	(lb/hr)	(tons/year)
2-Methylnaphthalene	2.4E-05	2.4E-08	7.1E-07	3.1E-06
3-Methylchloranthrene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.6E-08	4.7E-07	2.1E-06
Acenaphthene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
Acenaphthylene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
Anthracene	2.4E-06	2.4E-09	7.1E-08	3.1E-07
Benz(a)anthracene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
Benzene	2.1E-03	2.1E-06	6.2E-05	2.7E-04
Benzo(a)pyrene	1.2E-06	1.2E-09	3.5E-08	1.5E-07
Benzo(b)fluoranthene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
Benzo(g,h,i)perylene	1.2E-06	1.2E-09	3.5E-08	1.5E-07
Benzo(k)fluoranthene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
Chrysene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
Dibenzo(a,h)anthracene	1.2E-06	1.2E-09	3.5E-08	1.5E-07
Dichlorobenzene	1.2E-03	1.2E-06	3.5E-05	1.5E-04
Fluoranthene	3.0E-06	2.9E-09	8.8E-08	3.9E-07
Fluorene	2.8E-06	2.7E-09	8.2E-08	3.6E-07
Formaldehyde	7.5E-02	7.4E-05	2.2E-03	9.7E-03
Hexane	1.8E+00	1.8E-03	5.3E-02	2.3E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	5.3E-08	2.3E-07
Naphthalene	6.1E-04	6.0E-07	1.8E-05	7.9E-05
Phenanthrene	1.7E-05	1.7E-08	5.0E-07	2.2E-06
Pyrene	5.0E-06	4.9E-09	1.5E-07	6.4E-07
Toluene	3.4E-03	3.3E-06	1.0E-04	4.4E-04
Lead	5.0E-04	4.9E-07	1.5E-05	6.4E-05
Arsenic	2.0E-04	2.0E-07	5.9E-06	2.6E-05
Cadmium	1.1E-03	1.1E-06	3.2E-05	1.4E-04
Nickel	2.1E-03	2.1E-06	6.2E-05	2.7E-04
Benzo(a)pyrene	1.2E-06	1.2E-09	3.5E-08	1.5E-07
Total HAPs			5.55E-02	2.42E-01

¹ Emission factor from AP-42 Chapter 1 Section 4 – Natural Gas Combustion Table 1.4-3 - Emission Factors for Speciated Organic Compounds from Natural Gas Combustion, dated July 1998 or AP-42 Chapter 1 Section 4 – Natural Gas Combustion Table 1.4-4 - Emission Factors for Metals from Natural Gas Combustion.

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Emergency Generator Engine Emissions (IES-110/EP-110)

Table 9.a - Emergency Generator Engine Emissions

Assumptions	Value	Units
Number of Engines	1	engines
Power Output ¹	536	hp
Annual Hours of Operation ²	500	hrs/yr
Fuel Heat Rating ³	7,000	BTU/hp-hr
Heat Input ³	3.75	MMBTU/hr

Pollutant	Emission Factor		Emission Rates	
	g/bhp-hr	(lb/MMBtu)	(lb/hr) ⁷	(tpy) ⁸
NO _x ⁴	4.60	-	5.44	1.36
CO ⁴	1.20	-	1.42	0.35
VOC ⁴	0.01	-	0.01	2.95E-03
PM/PM ₁₀ /PM _{2.5} ⁴	0.10	-	0.12	0.03
SO ₂ ⁴	-	0.29	1.09	0.27
CO ₂ ⁵	-	164	615.33	153.83
CH ₄ ⁵	-	0.01	2.48E-02	6.20E-03
N ₂ O ⁵	-	0.001	4.96E-03	1.24E-03
CO ₂ e			6.17E+02	154.36
HAP Pollutant ⁶	Emission Factor		Emission Rates	
	(g/hp-hr)	(lb/MMBtu)	(lb/hr) ⁷	(tpy) ⁸
Benzene	-	9.33E-04	3.50E-03	8.75E-04
Toluene	-	4.09E-04	1.53E-03	3.84E-04
Xylenes	-	2.85E-04	1.07E-03	2.67E-04
1,3-Butadiene	-	3.91E-05	1.47E-04	3.67E-05
Formaldehyde	-	1.18E-03	4.43E-03	1.11E-03
Acetaldehyde	-	7.67E-04	2.88E-03	7.19E-04
Acrolein	-	9.25E-05	3.47E-04	8.68E-05
Benzo(a)pyrene	-	1.88E-07	7.05E-07	1.76E-07
TOTAL HAP			1.39E-02	3.48E-03

¹ Engine power output based on Caterpillar engine specified in Hatch design.

² Per 40 CFR §60.4243(d)(1)-(2), there is no time limit on the use of emergency stationary internal combustion engines in emergency situations; operation for non-emergency uses is limited to 100 hours per calendar year. However, for permitting the PTE has been based on 500 hours per year.

³ Heat input calculated assuming a brake-specific fuel capacity of 7,000 Btu/hp-hr, based on U.S. EPA AP-42 Chapter 3 Section 3.3 - Stationary Internal Combustion Sources, Table 3.3-1.

Estimated Heat Input (MMBTU/hr) = Average Brake-Specific Fuel Consumption (BSFC) (Btu/hp-hr) * Maximum Power Output (hp) * (1 MMBtu/1,000,000 Btu)

⁴ The emission factors for NMHC+NO_x, CO, and PM were obtained EPA Tier 3 Emission Standards (Table 4 to 40 CFR Part 60, Subpart IIII). To be conservative, the entire NO_x + NMHC emission standard is used as the emission factor for NO_x and for VOC. Emission factor for SO₂ taken from AP-42 Chapter 3 Section 3.3, Table 3.3-1.

⁵ From U.S. EPA AP-42 Chapter 3 Section 3.3, Table 3.3-1. CH₄ and N₂O emission factor not available from AP-42 so the Default emission factor for petroleum products from 40 CFR Part 98, Subpart C Table C-2 is used. Value listed in the table above is converted from kg/mmBtu.

⁶ From U.S. EPA AP-42 Chapter 3 Section 3.3, Table 3.3-2

⁷ Hourly Potential Emissions (lb/hr) = Estimated Heat Input (mmBtu/hr) x Emission Factor (lb/mmBtu)

⁸ Annual Potential Emissions (tpy) = Hourly Potential Emissions (lb/hr) x Annual Hours of Operation (hr/yr)

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Emergency Fire Pump Engine Emissions (IES-111/EP-111)

Table 10.a - Emergency Fire Pump Engine Emissions

Assumptions	Value	Units
Number of Pump Engines	1	engines
Power Output ¹	536	hp
Annual Hours of Operation ²	500	hrs/yr
Fuel Heat Rating ³	7,000	BTU/hp-hr
Heat Input ³	3.75	MMBTU/hr

Pollutant	Emission Factor		Emission Rates	
	g/bhp-hr	(lb/MMBtu)	(lb/hr) ⁷	(tpy) ⁸
NO _x ⁴	4.60	-	5.44	1.36
CO ⁴	1.20	-	1.42	0.35
VOC ⁴	0.01	-	0.01	2.95E-03
PM/PM ₁₀ /PM _{2.5} ⁴	0.10	-	0.12	0.03
SO ₂ ⁴	-	0.29	1.09	0.27
CO ₂ ⁵	-	164	615.33	153.83
CH ₄ ⁵	-	0.01	2.48E-02	6.20E-03
N ₂ O ⁵	-	0.001	4.96E-03	1.24E-03
CO ₂ e			6.17E+02	154.36

HAP Pollutant ⁶	Emission Factor		Emission Rates	
	(g/hp-hr)	(lb/MMBtu)	(lb/hr) ⁷	(tpy) ⁸
Benzene	-	9.33E-04	3.50E-03	8.75E-04
Toluene	-	4.09E-04	1.53E-03	3.84E-04
Xylenes	-	2.85E-04	1.07E-03	2.67E-04
1,3-Butadiene	-	3.91E-05	1.47E-04	3.67E-05
Formaldehyde	-	1.18E-03	4.43E-03	1.11E-03
Acetaldehyde	-	7.67E-04	2.88E-03	7.19E-04
Acrolein	-	9.25E-05	3.47E-04	8.68E-05
Benzo(a)pyrene	-	1.88E-07	7.05E-07	1.76E-07
TOTAL HAP			1.39E-02	3.48E-03

¹ Engine power output based on Caterpillar engine specified in Hatch design.

² Per 40 CFR §60.4243(d)(1)-(2), there is no time limit on the use of emergency stationary internal combustion engines in emergency situations; operation for non-emergency uses is limited to 100 hours per calendar year. However, for permitting the PTE has been based on 500 hours per year.

³ Heat input calculated assuming a brake-specific fuel capacity of 7,000 Btu/hp-hr, based on U.S. EPA AP-42 Chapter 3 Section 3.3 - Stationary Internal Combustion Sources, Table 3.3-1.

Estimated Heat Input (MMBTU/hr) = Average Brake-Specific Fuel Consumption (BSFC) (Btu/hp-hr) * Maximum Power Output (hp) * (1 MMBtu/1,000,000 Btu)

⁴ The emission factors for NMHC+NO_x, CO, and PM were obtained EPA Tier 3 Emission Standards (Table 4 to 40 CFR Part 60, Subpart IIII). To be conservative, the entire NO_x + NMHC emission standard is used as the emission factor for NO_x and for VOC. Emission factor for SO₂ taken from AP-42 Chapter 3 Section 3.3, Table 3.3-1.

⁵ From U.S. EPA AP-42 Chapter 3 Section 3.3, Table 3.3-1. CH₄ and N₂O emission factor not available from AP-42 so the Default emission factor for petroleum products from 40 CFR Part 98, Subpart C Table C-2 is used. Value listed in the table above is converted from kg/mmBtu.

⁶ From U.S. EPA AP-42 Chapter 3 Section 3.3, Table 3.3-2

⁷ Hourly Potential Emissions (lb/hr) = Estimated Heat Input (mmBtu/hr) x Emission Factor (lb/mmBtu)

⁸ Annual Potential Emissions (tpy) = Hourly Potential Emissions (lb/hr) x Annual Hours of Operation (hr/yr)

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
VOC Emissions from Product Usage (ES-051 and IES-112)

Table 11.a. VOC Emissions

Table 11a: VOC Emissions								
Reagent	Source Number	VOC Content ¹ %	HAP Content ¹ %	Product Usage ² tons/year	Actual VOC Emissions ³ lb/hr tons/year		PTE VOC Emissions ³ lb/hr tons/year	
Processing Plant Reagents								
Duramet - Ferrosilicon Powder	Insignificant	0	0	812				
Magnafloc 10 - Flocculant Powder	Insignificant	0	0	137				
Flotigam EDA (liquid)	Insignificant	0	0	43				
Methyl Isobutyl Carbinol (MIBC, 4-methyl-2-pentanol) Liquid	ES-051	100	0	12	2.74	12.00	4.57	20.00
Pionera F-100 Powder	Insignificant	0	0	361				
Dense Soda Ash (Na ₂ CO ₃ Powder)	Insignificant	0	0	326				
NaOH Powder	Insignificant	0	0	456				
Sylfat FA-2 Liquid	Insignificant	0	0	1006				
Water Treatment Plant Reagents								
NaOH	Insignificant	0	0					
Organosulfide	Insignificant	0	0					
Coagulant (Ferric chloride)	Insignificant	0	0					
Total				3,153	2.74	12.00	4.57	20.00

¹ Per product SDS.

² Based on "KM60-PR-DT-00001-1 Rev C Process Design Criteria HW JM DA Comments"

³ Assumed 100% of VOC content is emitted. VOC Emissions = Product Usage x VOC % Content of Product

Albemarle U.S., Inc.
Kings Mountain Mine and Concentrate Plant
Kings Mountain, NC
Diesel Storage Tank Emissions

Table 12.a - Horizontal Diesel Storage Tank Emissions

Emission Source/ Emission Point	Capacity	Diameter	Length	Annual Throughput	Annual Turnovers	VOC	
	(gal)	(ft)	(ft)	(gal/yr)		(lb/hr)	(tpy)
IES-001	2,500	6.6	11.8	500,000	156.0	0.026	0.002
IES-002	2,500	6.6	11.8	500,000	156.0	0.026	0.002
IES-003	2,500	6.6	11.8	500,000	156.0	0.026	0.002
IES-004	2,500	6.6	11.8	500,000	156.0	0.026	0.002
Total						0.103	0.008

Table 12.b - Vertical Diesel Storage Tank Emissions

Emission Source/ Emission Point	Capacity	Diameter	Height	Annual Throughput	Annual Turnovers	VOC	
	(gal)	(ft)	(ft)	(gal/yr)		(lb/hr)	(tpy)
IES-006	25,000	14.8	21.3	2,000,000	119.5	0.196	0.012

Notes: Annual emissions calculated using the Oklahoma DEQ online Storage Tank Emission Calculation Tool as recommended by NC DEQ. Hourly emissions = annual emissions / number of annual turnovers.
All VOC is assumed to be HAP.

Table 12.c - Total Diesel Storage Tank Emissions

	VOC	
	(lb/hr)	(tpy)
Total	0.299	0.020

535

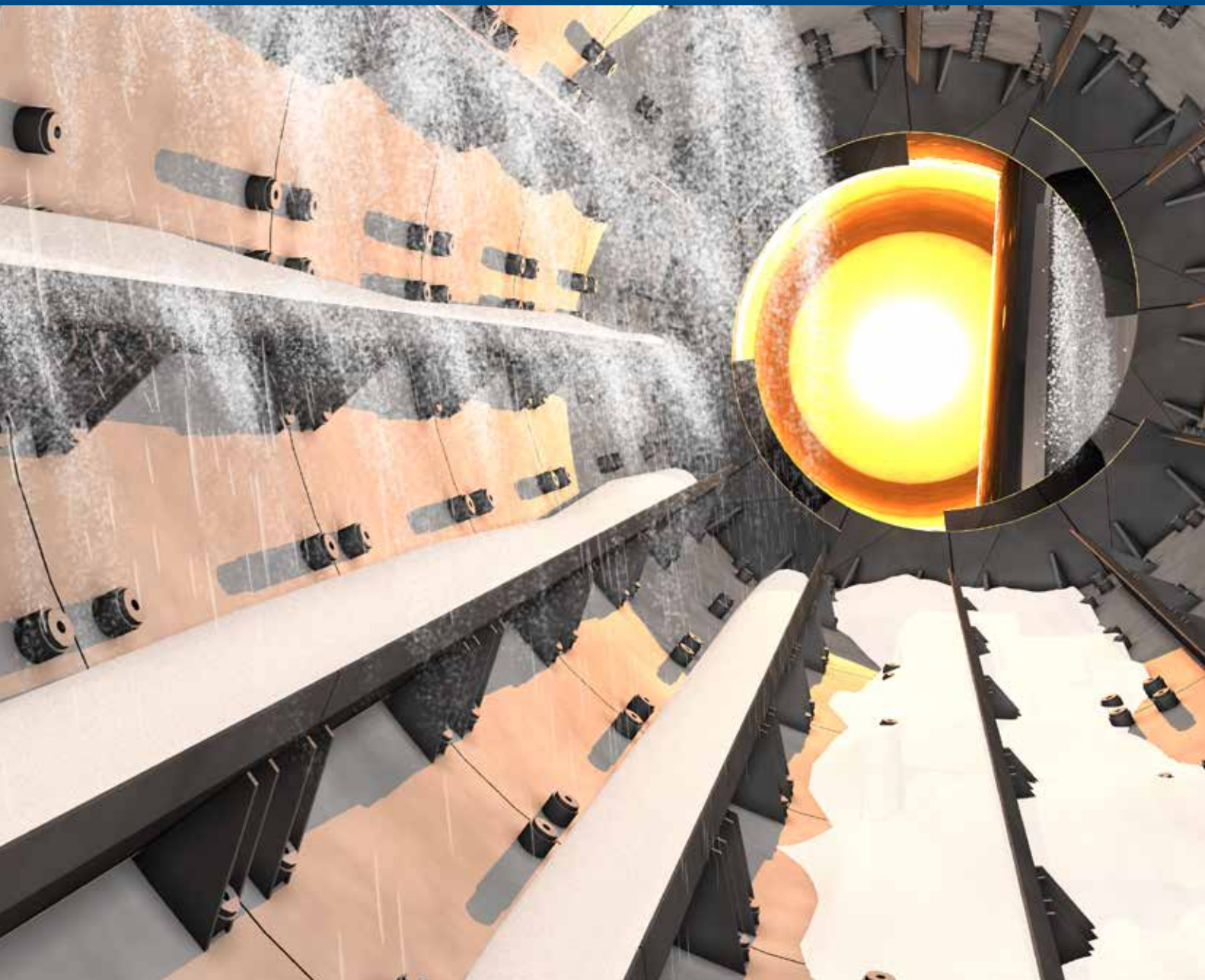
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APPENDIX C EQUIPMENT SPECIFICATIONS

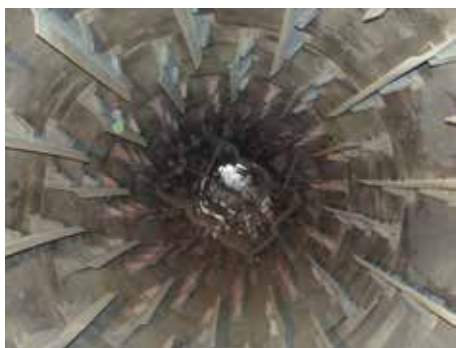
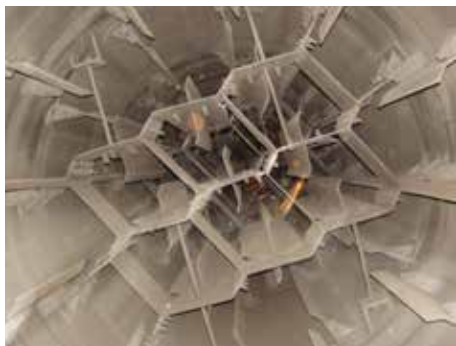
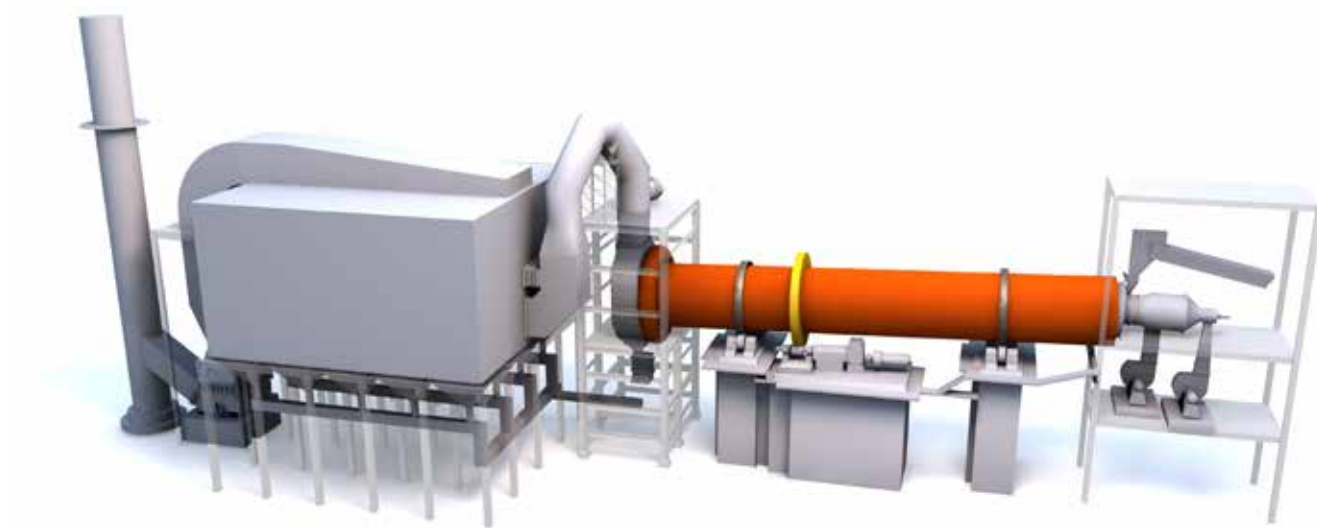
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One Source

Minerals Rotary Dryer Systems



FT Series Rotary Dryers



FLSmidth is known for its rugged, dependable product and system offerings. In line with this tradition, and in an effort to support today's fast track delivery schedules, FLSmidth has developed a standardized series of rotary dryers known as the FT Series Rotary Dryers. The FT Series Rotary Dryers have been designed in standard sizes between 3.0 and 6.0 meters in diameter. These standardized designs provide quick turnaround for approval documents and improved equipment deliveries as well as increased parts availability. We also offer larger and intermediate sizes to suit the process requirements. Contact us and we'll help you select the rotary dryer that best suits your specific application.

Systems features:

- Designed for processing a wide variety of materials; nickel ore, soda ash, phosphate, bauxite, sand, petroleum coke, and many other minerals at moisture contents up to 50%

- Co-current or counter-current flow systems are available

Drive components:

- Gear and pinion are reversible so that both flanks of the teeth can be utilized for longer life
- Forged pinion mounted on an extended reducer shaft for sizes from 3.0 to 3.8 m diameter. Forged pinion with integral shaft for sizes larger than 3.8 m diameter
- Automatic gear and pinion spray lubrication system.
- Fully enclosed gear guard for maximum protection
- Grease lubricated spherical roller support bearings designed for 80,000 hour of L_{10} life

Dryer shell and internals

- Shell is fabricated from ASTM A-36 carbon steel. Riding ring sections are made of heavier plate than the balance of the shell.
- Internal lifters shower the material for maximum drying and heat



transfer. The internals (starting from the feed end) consist of: feed advancing spirals to minimize backspilling, straight lifters bolted to angle brackets which are welded to the shell, and a section of bare shell at the discharge end to minimize dust entrainment

- Overlapping spring plate seals on both ends of the dryer minimize air infiltration
- Support rollers are made of high-grade forged steel and are integral with the shafts
- Greased lubricated spherical roller support bearings are designed for 80,000 hours of L_{10} life
- Full thrust is included. The downhill thrust roller is designed to take the full downhill thrust

Gas treatment

Air pollution control system options; electrostatic precipitators (ESP), baghouses, wet scrubbers or multi-clone collectors.

Your choice of fuel

Many types of fuels are being used successfully in commercial operations including natural gas, fuel oil, coal, petroleum coke, low heating value gases and alternative fuels.



Rotary dryer standard sizes

Diameter Meters	Length Meters	Typical Capacity MTPH	Motor Size	
			Kw	HP
3.0	21.0	130	112	150
3.2	22.4	160	130	175
3.4	23.8	190	149	200
3.6	25.2	230	186	250
3.8	26.6	270	223	300
4.0	28.0	310	261	350
4.2	29.4	360	298	400
4.4	30.8	410	335	450
4.6	32.2	470	373	500
4.8	33.6	540	447	600
5.0	35.0	610	484	650
5.2	36.4	675	522	700
5.4	37.8	760	560	750
5.6	39.2	850	634	850
5.8	40.6	940	671	900
6.0	42.0	1040	708	950

**Large sizes and intermediate sizes also available*

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Baghouse Equipment Specifications

CD-016 - Ore Sorting Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – ^{Two (2)} ~~One (1)~~ Module, Size ¹²¹⁵ ~~1715~~, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	44,300 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	2 4	
No. Bags/Module:	180 255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	7,920 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.59 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-018 - Sorter Bypass Conveyor Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – One (1) Module, Size ~~1715~~ ⁰⁹¹⁵, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	16,900 - 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 - 120	deg F
Gas Inlet Pressure:	-10 - -4	"wg
No. Modules:	1 - 4	
No. Bags/Module:	135 - 255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	2,970 - 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.69 - 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-020 - Sorter Sizing Screen Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – One (1) Module, Size ~~1715~~ ¹³¹⁵, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	22,300 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	1 4	
No. Bags/Module:	195 255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	4,290 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.2 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-021 - Tertiary Crusher Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – ~~One (1)~~ ^{Two (2)} Module, Size ~~1715~~ ¹⁰¹⁵, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	40,800 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	2 4	
No. Bags/Module:	150 255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	6,600 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	6.18 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-022 - Tertiary Crusher Sizing Screens Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – ^{Two (2)} ~~One (1)~~ Module, Size ¹⁰¹⁵ ~~1715~~, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	37,900 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	2 4	
No. Bags/Module:	150 255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	6,600 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.74 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-023 - Secondary Crusher Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – One (1) Module, Size 1715, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	28,200 -80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	1 -4	
No. Bags/Module:	255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	5,610 -22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.03 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-028 - Primary Crusher Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – ~~One (1)~~ ^{Three (3)} Module, Size 1715, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	104,000 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	3 4	
No. Bags/Module:	255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	16,830 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	6.2 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-039 - DMS Dryer Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – One (1) Module, Size ~~1715~~ ¹³¹⁵, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	25,000 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	1 4	
No. Bags/Module:	195 255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	4,290 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.83 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-040 - Stockpile Sizing Screen Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – ~~One (1)~~ ^{Two (2)} Module, Size ~~1715~~ ¹²¹⁵, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	43,300 ^{80,000}	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 ¹²⁰	deg F
Gas Inlet Pressure:	-10 ⁻⁴	"wg
No. Modules:	2 ⁴	
No. Bags/Module:	180 ²⁵⁵	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene ^{Polyester}	
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	7,920 ^{22,440}	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.47 ^{3.56}	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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CD-043 - DMS and Mag Sep Baghouse



Baghouse Design Parameters:

One (1) Suction Type Pulse Jet Baghouse – ~~One (1)~~ ^{Two(2)} Module, Size ~~1715~~ ¹⁰¹⁵, Model 168, Pulse Jet Dust Collector in a single configuration.

BAGHOUSE DESIGN PARAMETERS:		
Gas Volume (typical):	37,900 80,000	ACFM
Gas Temp (typical):	Ambient	
Gas Temp (maximum):	100 120	deg F
Gas Inlet Pressure:	-10 -4	"wg
No. Modules:	2 4	
No. Bags/Module:	150 255	
Filter Bag Diameter:	6	inches
Filter Bag Length:	168	inches
Filter Bag Material:	Polypropylene	Polyester
Cloth Area/Bag (nominal):	22	ft ²
Total Cloth Area:	6,600 22,440	ft ²
Net Cloth Area:	16,830	ft ²
Air/Cloth Ratio:		
Gross	5.74 3.56	ft/min
Net	4.75	ft/min

Module Construction:

- All welded modular design, fabricated from 10 ga. A-36 carbon steel.
- Reinforced for -20 "wg operational pressure which is higher than the maximum static pressure capability of the fan.
- Shipped in modular form, pre-assembled, to minimize the field installation/erection cost and time.

Housing Features:

- 3/16" tube sheet with laser cut, nominal 6" diameter, holes for precision snap ring bag seating.
- 1-1/2" double-diaphragm pulse valves (Turbo®).
- 120 VAC pilot solenoids in NEMA 4 housing.
- Compressed air reservoirs/manifolds with pressure gauge.
- Internal 1-1/2" pulse air blowpipe assemblies
- Walk-in-Plenum for access to the top of filter bags, if space allows.
- One (1) 20" x 48" housing access door.

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Concentrate Plant Reagent SDSs

1. Identification

Product identifier	SYLFAT™ FA2
Other means of identification	
SDS number	8719
Product Code	200000000258
Recommended use	Industrial uses: Uses of substances as such or in preparations at industrial sites. Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Company	Arizona Chemical Company LLC
Address	Building 100 4600 Touchton Road East, Suite 1200
City/State	Jacksonville, FL
Zip	32246
Country	USA
Phone Number	904-928-8700
Alternate Phone Number	800-526-5294
Fax Number	904-928-8780
Emergency-US	CHEMTREC 800-424-9300

2. Hazard(s) identification

Physical hazards	Not classified.
Health hazards	Not classified.
OSHA defined hazards	Not classified.
Label elements	
Hazard symbol	None.
Signal word	None.
Hazard statement	The substance does not meet the criteria for classification.
Precautionary statement	
Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	Store away from incompatible materials.
Disposal	Dispose of waste and residues in accordance with local authority requirements.
Hazard(s) not otherwise classified (HNOC)	After prolonged contact with highly porous materials, this product may spontaneously combust.
Supplemental information	None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Tall Oil Fatty Acids		61790-12-3	100

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed. Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Wear suitable protective equipment. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Absorb in vermiculite, dry sand or earth and place into containers. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water. Small Spills: Absorb in vermiculite, dry sand or earth and place into containers. Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material. May auto-oxidize with sufficient heat generation to ignite if spread (as a thin film) or absorbed on porous or fibrous material. Contaminated rags and cloths must be put in fireproof containers for disposal. Avoid prolonged exposure. Avoid release to the environment. Observe good industrial hygiene practices. Follow all SDS/label precautions even after container is emptied because they may retain product residues.
Conditions for safe storage, including any incompatibilities	Do not store in direct sunlight. Store in original tightly closed container. Keep containers closed when not in use. Store at ambient temperature and atmospheric pressure. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

U.S. - OSHA Components

Tall Oil Fatty Acids (CAS
61790-12-3)

Type

TWA

Value

5 mg/m3

Form

Oil Mist; Respirable

ACGIH

Components

Tall Oil Fatty Acids (CAS
61790-12-3)

Type

STEL

Value

10 mg/m3

Form

Oil Mist; Respirable

TWA

5 mg/m3

Oil Mist; Respirable

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Other

Wear suitable protective clothing.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.



General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Eye wash fountain and emergency showers are recommended.

9. Physical and chemical properties

Appearance

Liquid.

Physical state

Liquid.

Form

Liquid.

Color

Yellow.

Odor

Mild.

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

41 °F (5 °C)

Initial boiling point and boiling range

> 392 °F (> 200 °C)

Flash point

399.2 °F (204.0 °C) Cleveland Open Cup

Evaporation rate

0 (n-BuAc=1) estimated

Flammability (solid, gas)

Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)

Not available.

Flammability limit - upper (%)

Not available.

Explosive limit - lower (%)

Not available.

Explosive limit - upper (%)

Not available.

Vapor pressure	< 0.001 mm Hg at 20°C
Vapor density	Not available.
Relative density	0.9 at 25°C/25°C; (water=1)
Solubility(ies)	
Solubility (water)	12.6 mg/L at 20°C; Data is for similar product.
Partition coefficient (n-octanol/water)	4.9 - 6 at 30°C; Data is for similar product.
Auto-ignition temperature	494.6 °F (257 °C) Data is for similar product.
Decomposition temperature	Not available.
Viscosity	20 cP at 25°C
Other information	
Chemical family	Tall Oil Fatty Acids
Density	898.00 kg/m³ at 20°C
Flammability class	Combustible IIIB estimated
Percent volatile	0 % estimated

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Strong oxidizing agents. Avoid temperatures exceeding the flash point. Contact with incompatible materials. Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Upon decomposition this product emits acrid dense smoke with carbon dioxide, carbon monoxide, water and other products of combustion.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Tall Oil Fatty Acids	Draize Test, No eye irritation. Result: Negative Species: Albino rabbit Organ: Eye Test Duration: 7 days Observation Period: 7 days

Ingestion Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics Exposure may cause temporary irritation, redness, or discomfort.

Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Components	Species	Test Results
Tall Oil Fatty Acids (CAS 61790-12-3)		
Acute		
Dermal		
LD50	Albino rabbit	> 2000 mg/kg, 14 days At this dose no death occurred.

Components	Species	Test Results
Oral LD50	Albino Sprague-Dawley rat	> 10000 mg/kg, 14 days At this dose no death occurred.
* Estimates for product may be based on additional component data not shown.		
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.	
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.	
Eye Contact Tall Oil Fatty Acids	Draize Test, No eye irritation. Result: Negative Species: Albino rabbit Organ: Eye Test Duration: 7 days Observation Period: 7 days	
Respiratory or skin sensitization		
Respiratory sensitization	Not available.	
Skin sensitization	This product is not expected to cause skin sensitization.	
Skin sensitization Tall Oil Fatty Acids	Buehler Test, Not a skin sensitizer. Result: Negative Species: Guinea pig Organ: Skin Notes: OECD 406 Maximisation Assay (Magnusson and Kligman), Not a skin sensitizer. Result: Negative Species: Guinea pig Organ: Skin Notes: OECD 406	
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.	
Mutagenicity Tall Oil Fatty Acids	Germ Cell Mutagenicity: Ames, No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. Result: Negative Species: Salmonella typhimurium Notes: OECD 471	
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.	
IARC Monographs. Overall Evaluation of Carcinogenicity		
Not listed.		
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)		
Not regulated.		
US. National Toxicology Program (NTP) Report on Carcinogens		
Not listed.		
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.	
Specific target organ toxicity - single exposure	Not classified.	
Specific target organ toxicity - repeated exposure	Not classified.	
Aspiration hazard	Not available.	
Chronic effects	Prolonged inhalation may be harmful.	
12. Ecological information		
Ecotoxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.	

Components		Species	Test Results
Tall Oil Fatty Acids (CAS 61790-12-3)			
	EC50	Bacteria (<i>Pseudomonas putida</i>)	> 10000 mg/l, 16 hr
Aquatic			
Algae	EL50	Green algae (<i>Selenastrum capricornutum</i>)	> 1000 mg/l, 72 hr Growth rate; OECD 201
Crustacea	EL50	Water flea (<i>Daphnia magna</i>)	> 1000 mg/l, 48 hr OECD 202
Fish	LL50	Zebra danio (<i>Danio rerio</i>)	> 10000 mg/l, 96 hr

* Estimates for product may be based on additional component data not shown.

Persistence and degradability The product is biodegradable.

Biodegradability

Percent degradation (Aerobic biodegradation)

Tall Oil Fatty Acids

88 - 100 % CO₂ Evolution Test
Species: Activated sewage sludge
Test Duration: 28 d

Bioaccumulative potential

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available.

15. Regulatory information

US federal regulations This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.
Use as animal feed is prohibited in the United States. Similar regulations may restrict such use in other locations.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

NFPA ratings

Health: 1
Flammability: 1
Instability: 0

NFPA ratings



16. Other information, including date of preparation or last revision

Issue date 02-23-2015
Revision date 12-13-2016
Version # 3.0

Disclaimer

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Revision information

Hazard(s) identification: National / local information
Ecological Information: Ecotox Property Data



Washington Mills Duramet

Not Available

Chemwatch: 9258123

Version No: 4.1

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Chemwatch Hazard Alert Code: 2

Issue Date: 11/01/2019

Print Date: 02/01/2023

S.GHS.USA.EN

SECTION 1 Identification

Product Identifier

Product name	Washington Mills Duramet
Chemical Name	Not Applicable
Synonyms	Ferrosilicon
Chemical formula	Not Applicable
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Use according to manufacturer's directions.
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Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	Not Available
Address	Not Available
Telephone	Not Available
Fax	Not Available
Website	Not Available
Email	Not Available

Emergency phone number

Association / Organisation	CHEMWATCH EMERGENCY RESPONSE
Emergency telephone numbers	+1 855-237-5573
Other emergency telephone numbers	+61 3 9573 3188

Once connected and if the message is not in your preferred language then please dial 01

Una vez conectado y si el mensaje no está en su idioma preferido, por favor marque 02

SECTION 2 Hazard(s) identification

Classification of the substance or mixture

Chemwatch Hazard Ratings

	Min	Max
Flammability	0	
Toxicity	2	
Body Contact	1	
Reactivity	2	
Chronic	0	

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Serious Eye Damage/Eye Irritation Category 2B, Acute Toxicity (Oral) Category 4
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Label elements

Hazard pictogram(s)	
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Washington Mills Duramet

Signal word **Warning**

Hazard statement(s)

H320	Causes eye irritation.
H302	Harmful if swallowed.

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.

Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
P330	Rinse mouth.

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7439-89-6	70-80	<u>iron</u>
7440-21-3	10-20	<u>silicon</u>
7440-32-6	5-10	<u>titanium</u>
7429-90-5	<5	<u>aluminium</u>
Not Available	<1	other metallics, as impurities

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 First-aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: - Wash out immediately with fresh running water. - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. - Seek medical attention without delay; if pain persists or recurs seek medical attention. - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. DO NOT attempt to remove particles attached to or embedded in eye . - Lay victim down, on stretcher if available and pad BOTH eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye. - Seek urgent medical assistance, or transport to hospital.
Skin Contact	If skin contact occurs: - Immediately remove all contaminated clothing, including footwear. - Flush skin and hair with running water (and soap if available). - Seek medical attention in event of irritation. For thermal burns: - Decontaminate area around burn. - Consider the use of cold packs and topical antibiotics. For first-degree burns (affecting top layer of skin) - Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides. - Use compresses if running water is not available. - Cover with sterile non-adhesive bandage or clean cloth. - Do NOT apply butter or ointments; this may cause infection. - Give over-the counter pain relievers if pain increases or swelling, redness, fever occur. For second-degree burns (affecting top two layers of skin) - Cool the burn by immerse in cold running water for 10-15 minutes. - Use compresses if running water is not available. - Do NOT apply ice as this may lower body temperature and cause further damage. - Do NOT break blisters or apply butter or ointments; this may cause infection. - Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape. To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort):

Continued...

Washington Mills Duramet

	▸ Lay the person flat. ▸ Elevate feet about 12 inches. ▸ Elevate burn area above heart level, if possible. ▸ Cover the person with coat or blanket. ▸ Seek medical assistance. For third-degree burns Seek immediate medical or emergency assistance. In the mean time: ▸ Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound. ▸ Separate burned toes and fingers with dry, sterile dressings. ▸ Do not soak burn in water or apply ointments or butter; this may cause infection. ▸ To prevent shock see above. ▸ For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway. ▸ Have a person with a facial burn sit up. ▸ Check pulse and breathing to monitor for shock until emergency help arrives.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor.
Ingestion	▸ IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. ▸ For advice, contact a Poisons Information Centre or a doctor. ▸ Urgent hospital treatment is likely to be needed. ▸ In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition. ▸ If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist. ▸ If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS. Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise: ▸ INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. NOTE: Wear a protective glove when inducing vomiting by mechanical means.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

Copper, magnesium, aluminium, antimony, iron, manganese, nickel, zinc (and their compounds) in welding, brazing, galvanising or smelting operations all give rise to thermally produced particulates of smaller dimension than may be produced if the metals are divided mechanically. Where insufficient ventilation or respiratory protection is available these particulates may produce "metal fume fever" in workers from an acute or long term exposure.

- Onset occurs in 4-6 hours generally on the evening following exposure. Tolerance develops in workers but may be lost over the weekend. (Monday Morning Fever)
- Pulmonary function tests may indicate reduced lung volumes, small airway obstruction and decreased carbon monoxide diffusing capacity but these abnormalities resolve after several months.
- Although mildly elevated urinary levels of heavy metal may occur they do not correlate with clinical effects.
- The general approach to treatment is recognition of the disease, supportive care and prevention of exposure.
- Seriously symptomatic patients should receive chest x-rays, have arterial blood gases determined and be observed for the development of tracheobronchitis and pulmonary edema.

[Ellenhorn and Barceloux: Medical Toxicology]

For acute or short term repeated exposures to iron and its derivatives:

- Always treat symptoms rather than history.
- In general, however, toxic doses exceed 20 mg/kg of ingested material (as elemental iron) with lethal doses exceeding 180 mg/kg.
- Control of iron stores depend on variation in absorption rather than excretion. Absorption occurs through aspiration, ingestion and burned skin.
- Hepatic damage may progress to failure with hypoprothrombinaemia and hypoglycaemia. Hepatorenal syndrome may occur.
- Iron intoxication may also result in decreased cardiac output and increased cardiac pooling which subsequently produces hypotension.
- Serum iron should be analysed in symptomatic patients. Serum iron levels (2-4 hrs post-ingestion) greater than 100 ug/dL indicate poisoning with levels, in excess of 350 ug/dL, being potentially serious. Emesis or lavage (for obtunded patients with no gag reflex) are the usual means of decontamination.
- Activated charcoal does not effectively bind iron.
- Catharsis (using sodium sulfate or magnesium sulfate) may only be used if the patient already has diarrhoea.
- Deferoxamine is a specific chelator of ferric (3+) iron and is currently the antidote of choice. It should be administered parenterally. [Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 Fire-fighting measures

Extinguishing media

Metal dust fires need to be smothered with sand, inert dry powders.

DO NOT USE WATER, CO2 or FOAM.

- Use DRY sand, graphite powder, dry sodium chloride based extinguishers, G-1 or Met L-X to smother fire.
- Confining or smothering material is preferable to applying water as chemical reaction may produce flammable and explosive hydrogen gas.
- **DO NOT** use halogenated fire extinguishing agents.

Special hazards arising from the substrate or mixture

Fire Incompatibility	▸ Reacts with acids producing flammable / explosive hydrogen (H2) gas
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Special protective equipment and precautions for fire-fighters

Continued...

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Fire Fighting	▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves in the event of a fire. ▶ Prevent, by any means available, spillage from entering drains or water courses. ▶ Use fire fighting procedures suitable for surrounding area.
Fire/Explosion Hazard	▶ DO NOT disturb burning dust. Explosion may result if dust is stirred into a cloud, by providing oxygen to a large surface of hot metal. ▶ DO NOT use water or foam as generation of explosive hydrogen may result. With the exception of the metals that burn in contact with air or water (for example, sodium), masses of combustible metals do not represent unusual fire risks because they have the ability to conduct heat away from hot spots so efficiently that the heat of combustion cannot be maintained - this means that it will require a lot of heat to ignite a mass of combustible metal. Decomposition may produce toxic fumes of: silicon dioxide (SiO₂) metal oxides May emit poisonous fumes. May emit corrosive fumes.

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	▶ Remove all ignition sources. ▶ Clean up all spills immediately. ▶ Avoid contact with skin and eyes. ▶ Control personal contact with the substance, by using protective equipment.
Major Spills	If molten: ▶ Contain the flow using dry sand or salt flux as a dam. ▶ All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. ▶ Allow the spill to cool before remelting scrap. Moderate hazard. ▶ CAUTION: Advise personnel in area. ▶ Alert Emergency Services and tell them location and nature of hazard. ▶ Control personal contact by wearing protective clothing.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	For molten metals: · Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Prevent concentration in hollows and sumps.
Other information	▶ Store in original containers. ▶ Keep containers securely sealed. ▶ Store in a cool, dry area protected from environmental extremes. ▶ Store away from incompatible materials and foodstuff containers.

Conditions for safe storage, including any incompatibilities

Suitable container	▶ Bulk bags: Reinforced bags required for dense materials. ▶ CARE: Packing of high density product in light weight metal or plastic packages may result in container collapse with product release ▶ Heavy gauge metal packages / Heavy gauge metal drums ▶ Polyethylene or polypropylene container. ▶ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	The material is described as an electropositive metal. The activity or electromotive series of metals is a listing of the metals in decreasing order of their reactivity with hydrogen-ion sources such as water and acids. In the reaction with a hydrogen-ion source, the metal is oxidised to a metal ion, and the hydrogen ion is reduced to H₂. The ordering of the activity series can be related to the standard reduction potential of a metal cation. For aluminas (aluminium oxide): Incompatible with hot chlorinated rubber. In the presence of chlorine trifluoride may react violently and ignite. -May initiate explosive polymerisation of olefin oxides including ethylene oxide. -Produces exothermic reaction above 200°C with halocarbons and an exothermic reaction at ambient temperatures with halocarbons in the presence of other metals. Titanium: ▶ reacts with oxidising agents, aluminium, carbon dioxide, chlorinated solvents, strong acids, oxygen, halogens ▶ reacts violently with cupric or lead oxide when heated ▶ powder mixtures with potassium perchlorate, with nickel and infusional earth ignite with very small sparks causing severe explosion ▶ with trichloroethylene or trichlorofluoroethylene with flash or spark on heavy impact ▶ reacts with fluorine at 150 deg C, chlorine at 300 deg C, bromine at 360 deg C and iodine at >360 deg C ▶ when heated at red heat (700 deg C) decomposes steam to hydrogen and when heated above 800 deg C burns vigorously in pure

Continued...

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nitrogen; burns in carbon dioxide above 550 deg C; the hot metal explodes violently on contact with water.

- ▶ **WARNING:** Avoid or control reaction with peroxides. All *transition metal* peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.
- ▶ The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono-or poly-fluorobenzene show extreme sensitivity to heat and are explosive.
- ▶ Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
- ▶ These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
- ▶ The state of subdivision may affect the results.
- ▶ Many metals may incandesce, react violently, ignite or react explosively upon addition of concentrated nitric acid.

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US OSHA Permissible Exposure Limits (PELs) Table Z-1	iron	Particulates Not Otherwise Regulated (PNOR)- Total dust	15 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-1	iron	Particulates Not Otherwise Regulated (PNOR)- Respirable fraction	5 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	iron	Inert or Nuisance Dust: Respirable fraction	5 mg/m3 / 15 mppcf	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	iron	Inert or Nuisance Dust: Total Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	iron	Particulates not otherwise regulated	Not Available	Not Available	Not Available	See Appendix D
US OSHA Permissible Exposure Limits (PELs) Table Z-1	silicon	Silicon- Respirable fraction	5 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-1	silicon	Silicon- Total dust	15 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	silicon	Inert or Nuisance Dust: Total Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	silicon	Inert or Nuisance Dust: Respirable fraction	5 mg/m3 / 15 mppcf	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	silicon	Silicon - respirable	5 mg/m3	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	silicon	Silicon - total	10 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-1	titanium	Particulates Not Otherwise Regulated (PNOR)- Total dust	15 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-1	titanium	Particulates Not Otherwise Regulated (PNOR)- Respirable fraction	5 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	titanium	Inert or Nuisance Dust: Total Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	titanium	Inert or Nuisance Dust: Respirable fraction	5 mg/m3 / 15 mppcf	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	titanium	Particulates not otherwise regulated	Not Available	Not Available	Not Available	See Appendix D
US OSHA Permissible Exposure Limits (PELs) Table Z-1	aluminium	Aluminum Metal (as Al)- Respirable fraction	5 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-1	aluminium	Aluminum Metal (as Al)- Total dust	15 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	aluminium	Inert or Nuisance Dust: Total Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Limits (PELs) Table Z-3	aluminium	Inert or Nuisance Dust: Respirable fraction	5 mg/m3 / 15 mppcf	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	aluminium	Aluminum - total	10 mg/m3	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	aluminium	Aluminum - respirable	5 mg/m3	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	aluminium	Aluminum (pyro powders and welding fumes, as Al)	5 mg/m3	Not Available	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
iron	3.2 mg/m3	35 mg/m3	150 mg/m3
silicon	45 mg/m3	100 mg/m3	630 mg/m3
titanium	30 mg/m3	330 mg/m3	2,000 mg/m3

Ingredient	Original IDLH	Revised IDLH
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Continued...

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Ingredient	Original IDLH	Revised IDLH
iron	Not Available	Not Available
silicon	Not Available	Not Available
titanium	Not Available	Not Available
aluminium	Not Available	Not Available

Exposure controls

Appropriate engineering controls	Metal dusts must be collected at the source of generation as they are potentially explosive. ▶ Avoid ignition sources. ▶ Good housekeeping practices must be maintained. ▶ Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.
Personal protection	
Eye and face protection	▶ Safety glasses with side shields. ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.
Skin protection	See Hand protection below
Hands/feet protection	The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice. Personal hygiene is a key element of effective hand care. ▶ Protective gloves eg. Leather gloves or gloves with Leather facing Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present. ▶ polychloroprene. ▶ nitrile rubber. ▶ butyl rubber.
Body protection	See Other protection below
Other protection	▶ Overalls. ▶ P.V.C apron. ▶ Barrier cream. ▶ Skin cleansing cream.

Respiratory protection

Type -P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	-	PAPR-P1
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

* - Negative pressure demand ** - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Gray granular solid with no odour; does not mix with water.		
Physical state	Divided Solid	Relative density (Water = 1)	6.7
Odour	Not Available	Partition coefficient n-octanol / water	Not Available

Continued...

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Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Applicable
pH (as supplied)	Not Applicable	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	2700	Viscosity (cSt)	Not Applicable
Initial boiling point and boiling range (°C)	Not Applicable	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Applicable	Surface Tension (dyn/cm or mN/m)	Not Applicable
Lower Explosive Limit (%)	Not Applicable	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Immiscible	pH as a solution (1%)	Not Applicable
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur. ▶ Presence of heat source and ignition source
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual. There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. In animals, instilling silicon dust in the windpipe caused only slight damage to the epithelium. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures. Effects on lungs are significantly enhanced in the presence of respirable particles. The inhalation of small particles of metal oxide results in sudden thirst, a sweet, metallic foul taste, throat irritation, cough, dry mucous membranes, tiredness and general unwellness. Headache, nausea and vomiting, fever or chills, restlessness, sweating, diarrhoea, excessive urination and prostration may also occur.
Ingestion	Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. Not normally a hazard due to the physical form of product. The material is a physical irritant to the gastro-intestinal tract
Skin Contact	There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons. Though considered non-harmful, slight irritation may result from contact because of the abrasive nature of the aluminium oxide particles. Thus it may cause itching and skin reaction and inflammation. Irritation and skin reactions are possible with sensitive skin Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	There is some evidence to suggest that this material can cause eye irritation and damage in some persons. Contact with the eye by metal dusts may produce mechanical abrasion or foreign body penetration of the eyeball. Iron particles embedded in the eye may cause discolouration of the cornea and iris, and effects on the pupil such as poor reaction to light and accommodation.
Chronic	Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Animal testing shows long term exposure to aluminium oxides may cause lung disease and cancer, depending on the size of the particle. The smaller the size, the greater the tendencies of causing harm. Overexposure to the breathable dust may cause coughing, wheezing, difficulty in breathing and impaired lung function. Chronic symptoms may include decreased vital lung capacity and chest infections. Repeated exposures in the workplace to high levels of fine-divided dusts may produce a condition known as pneumoconiosis, which is the lodgement of any inhaled dusts in the lung, irrespective of the effect. This is particularly true when a significant number of particles less than 0.5 microns (1/50000 inch) are present. Chronic excessive intake of iron have been associated with damage to the liver and pancreas. People with a genetic disposition to poor control over iron are at an increased risk. Metallic dusts generated by the industrial process give rise to a number of potential health problems. The larger particles, above 5 micron, are nose and throat irritants.

Washington Mills Duramet	TOXICITY	IRRITATION
	Not Available	Not Available

Washington Mills Duramet

iron	TOXICITY	IRRITATION
	Oral (Rat) LD50: 98600 mg/kg ^[2]	Not Available
silicon	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
	Oral (Rat) LD50: 3160 mg/kg ^[2]	Skin: no adverse effect observed (not irritating) ^[1]
titanium	TOXICITY	IRRITATION
	Oral (Rat) LD50: >2000 mg/kg ^[1]	Not Available
aluminium	TOXICITY	IRRITATION
	Inhalation(Rat) LC50: >2.3 mg/l4h ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
	Oral (Rat) LD50: >2000 mg/kg ^[1]	Skin: no adverse effect observed (not irritating) ^[1]
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

SILICON	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. Injection of silicon into the peritoneal cavity produced only minor local trauma and foreign body reaction. In animal testing, silicon dioxide given by mouth did not cause clinical signs or cell changes. Silicon dioxide was largely eliminated in the faeces. The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
Washington Mills Duramet & SILICON & TITANIUM & ALUMINIUM	No significant acute toxicological data identified in literature search.

Acute Toxicity	✓	Carcinogenicity	✗
Skin Irritation/Corrosion	✗	Reproductivity	✗
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✗
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

Washington Mills Duramet	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
iron	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	48h	Algae or other aquatic plants	0.1-4mg/l	4
	EC50	72h	Algae or other aquatic plants	18mg/l	2
	LC50	96h	Fish	0.00499-0.00819mg/l	4
	EC50	48h	Crustacea	>100mg/l	2
silicon	Endpoint	Test Duration (hr)	Species	Value	Source
	EC10(ECx)	1.28h	Algae or other aquatic plants	>=66<=88mg/l	2
	EC50	72h	Algae or other aquatic plants	~250mg/l	2
titanium	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	48h	Crustacea	<=1mg/l	2
	EC50	72h	Algae or other aquatic plants	13mg/l	2
	LC50	96h	Fish	>100mg/l	2
	EC50	48h	Crustacea	>100mg/l	2
aluminium	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	48h	Crustacea	>100mg/l	1
	EC50	96h	Algae or other aquatic plants	0.0054mg/l	2

Continued...

	EC50	72h	Algae or other aquatic plants	0.0169mg/l	2
	LC50	96h	Fish	0.078-0.108mg/l	2
	EC50	48h	Crustacea	0.7364mg/l	2

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	No Data available for all ingredients	No Data available for all ingredients

Bioaccumulative potential

Ingredient	Bioaccumulation
	No Data available for all ingredients

Mobility in soil

Ingredient	Mobility
	No Data available for all ingredients

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	- Containers may still present a chemical hazard/ danger when empty. - Return to supplier for reuse/ recycling if possible. Otherwise: - If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. - Where possible retain label warnings and SDS and observe all notices pertaining to the product. Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: - Reduction - Reuse - Recycling - Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. - DO NOT allow wash water from cleaning or process equipment to enter drains. - It may be necessary to collect all wash water for treatment before disposal. - In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. - Where in doubt contact the responsible authority. - Recycle wherever possible or consult manufacturer for recycling options. - Consult State Land Waste Management Authority for disposal. - Bury residue in an authorised landfill. - Recycle containers if possible, or dispose of in an authorised landfill.
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SECTION 14 Transport information

Labels Required

Marine Pollutant	NO
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Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
iron	Not Available
silicon	Not Available
titanium	Not Available
aluminium	Not Available

Transport in bulk in accordance with the ICG Code

Product name	Ship Type
iron	Not Available
silicon	Not Available

Product name	Ship Type
titanium	Not Available
aluminium	Not Available

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

iron is found on the following regulatory lists	
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	US OSHA Permissible Exposure Limits (PELs) Table Z-1
US - Alaska Air Quality Control - Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5	US OSHA Permissible Exposure Limits (PELs) Table Z-3
US DOE Temporary Emergency Exposure Limits (TEELs)	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US NIOSH Recommended Exposure Limits (RELs)	US TSCA Chemical Substance Inventory - Interim List of Active Substances
silicon is found on the following regulatory lists	
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	US OSHA Permissible Exposure Limits (PELs) Table Z-1
US - Alaska Air Quality Control - Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5	US OSHA Permissible Exposure Limits (PELs) Table Z-3
US - Massachusetts - Right To Know Listed Chemicals	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US DOE Temporary Emergency Exposure Limits (TEELs)	US TSCA Chemical Substance Inventory - Interim List of Active Substances
US NIOSH Recommended Exposure Limits (RELs)	
titanium is found on the following regulatory lists	
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	US OSHA Permissible Exposure Limits (PELs) Table Z-1
US - Alaska Air Quality Control - Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5	US OSHA Permissible Exposure Limits (PELs) Table Z-3
US DOE Temporary Emergency Exposure Limits (TEELs)	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US NIOSH Recommended Exposure Limits (RELs)	US TSCA Chemical Substance Inventory - Interim List of Active Substances
aluminium is found on the following regulatory lists	
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	US NIOSH Recommended Exposure Limits (RELs)
US - Alaska Air Quality Control - Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5	US OSHA Permissible Exposure Limits (PELs) Table Z-1
US - Massachusetts - Right To Know Listed Chemicals	US OSHA Permissible Exposure Limits (PELs) Table Z-3
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US Department of Homeland Security (DHS) - Chemical Facility Anti-Terrorism Standards (CFATS) - Chemicals of Interest	US TSCA Chemical Substance Inventory - Interim List of Active Substances
US EPCRA Section 313 Chemical List	

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 311/312 hazard categories	
Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	No
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No
Acute toxicity (any route of exposure)	Yes
Reproductive toxicity	No
Skin Corrosion or Irritation	No
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	No
Specific target organ toxicity (single or repeated exposure)	No
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No

Hazards Not Otherwise Classified	No
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US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)
None Reported

State Regulations

US. California Proposition 65
None Reported

National Inventory Status

National Inventory	Status
Australia - AIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (iron; silicon; titanium; aluminium)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (iron; silicon; titanium; aluminium)
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	11/01/2019
Initial Date	03/11/2014

SDS Version Summary

Version	Date of Update	Sections Updated
3.1	03/13/2019	Expiration. Review and Update
4.1	11/01/2019	One-off system update. NOTE: This may or may not change the GHS classification

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit.
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
AIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances

Washington Mills Duramet

TSCA: Toxic Substances Control Act

TCSI: Taiwan Chemical Substance Inventory

INSQ: Inventario Nacional de Sustancias Químicas

NCI: National Chemical Inventory

FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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TEL (+61 3) 9572 4700.

MAGNAFLOC 10

PRODUCT DISTRIBUTED BY / PRODUIT DISTRIBUÉ PAR

Brenntag Canada Inc.
43 Jutland Road.
Toronto, Ontario
M8Z 2G6
(416) 259-8231

WHMIS Number: 00061491
Index: HCl0346/16A
Effective Date: 2016 February 09
Date of Revision: 2016 February 09
Website: <http://www.brenntag.ca>

EMERGENCY TELEPHONE NUMBER (For Emergencies Involving Chemical Spills or Releases)

1 855 273 6824

NUMÉRO DE TÉLÉPHONE D'URGENCE (pour les urgences impliquant des rejets ou des déversements chimiques)

This document consists of an SDS in English and French in GHS format.

Le présent document est une FDS en anglais et en français en format SGH.

This product is considered to be non-regulated by WHMIS standards and therefore this SDS will not be subject to any periodic or time based update.

Le présent produit n'est pas réglementé par le SIMDUT. La fiche signalétique ne fera donc pas l'objet de mises à jour périodiques.

READ THE ENTIRE SAFETY DATA SHEET (SDS) FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

LIRE LA FICHE DE DONNÉES DE SÉCURITÉ (FDS) POUR UNE ÉVALUATION COMPLÈTE DES DANGERS QUE REPRÉSENTE CE PRODUIT.

Safety Data Sheet

Magnafloc® 10

Revision date : 2016/02/09

Version: 3.0

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(30481447/SDS_GEN_CA/EN)

1. Identification

Product identifier used on the label

Magnafloc® 10

Recommended use of the chemical and restriction on use

Recommended use*: flocculation agent

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF Canada Inc.
100 Milverton Drive
Mississauga, ON L5R 4H1, CANADA

Telephone: +1 289 360-1300

Emergency telephone number

CANUTEC (reverse charges): (613) 996-6666

BASF HOTLINE: (800) 454-COPE (2673)

Other means of identification

Chemical family: polyacrylamide, anionic

2. Hazards Identification

According to Hazardous Products Regulations (HPR) (SOR/2015-17)

Classification of the product

No need for classification according to GHS criteria for this product.

Label elements

The product does not require a hazard warning label in accordance with GHS criteria.

Hazards not otherwise classified

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Very slippery when wet.

Labeling of special preparations (GHS):

This product is not combustible in the form in which it is shipped by the manufacturer, but may form a combustible dust through downstream activities (e.g. grinding, pulverizing) that reduce its particle size.

According to Controlled Products Regulations (CPR) (SOR/88-66)

Emergency overview

Caution - Slippery when wet!

May cause some eye irritation which should cease after removal of the product.

May cause some irritation to the respiratory system if dust is inhaled.

May cause skin irritation.

This type of product has a tendency to create dust if roughly handled. It does not burn readily but as with many organic powders, flammable dust clouds may be formed in air.

Take precautionary measures against static discharges.

Use with local exhaust ventilation.

Wear suitable protective clothing, gloves and eye/face protection.

3. Composition / Information on Ingredients

According to Hazardous Products Regulations (HPR) (SOR/2015-17)

This product does not contain any components classified as hazardous under the referenced regulation.

4. First-Aid Measures

Description of first aid measures

General advice:

Remove contaminated clothing.

If inhaled:

If difficulties occur after dust has been inhaled, remove to fresh air and seek medical attention.

If on skin:

Wash thoroughly with soap and water.

If in eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open.

If swallowed:

Rinse mouth and then drink plenty of water. Check breathing and pulse. Place victim in the recovery position, cover and keep warm. Loosen tight clothing such as a collar, tie, belt or waistband. Seek medical attention. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions.

Most important symptoms and effects, both acute and delayed

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Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further important symptoms and effects are so far not known.

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
dry powder, foam

Unsuitable extinguishing media for safety reasons:
water jet

Additional information:

If water is used, restrict pedestrian and vehicular traffic in areas where slip hazard may exist.

Special hazards arising from the substance or mixture

Hazards during fire-fighting:

carbon oxides, nitrogen oxides

The substances/groups of substances mentioned can be released in case of fire. Very slippery when wet.

Advice for fire-fighters

Protective equipment for fire-fighting:

Wear a self-contained breathing apparatus.

Further information:

Dusty conditions may ignite explosively in the presence of an ignition source causing flash fire.

6. Accidental release measures

Further accidental release measures:

Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Avoid the formation and build-up of dust - danger of dust explosion. Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting and eliminate open flame and other sources of ignition. Forms slippery surfaces with water.

Personal precautions, protective equipment and emergency procedures

Use personal protective clothing.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

Nonsparking tools should be used.

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7. Handling and Storage

Precautions for safe handling

Breathing must be protected when large quantities are decanted without local exhaust ventilation. Handle in accordance with good industrial hygiene and safety practice. Forms slippery surfaces with water.

Protection against fire and explosion:

Avoid dust formation. Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting and eliminate open flame and other sources of ignition. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids (2013 Edition) for safe handling.

Conditions for safe storage, including any incompatibilities

Further information on storage conditions: Store in unopened original containers in a cool and dry place. Avoid wet, damp or humid conditions, temperature extremes and ignition sources.

Storage stability:

Avoid extreme heat.

8. Exposure Controls/Personal Protection

No occupational exposure limits known.

Advice on system design:

It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.

Hand protection:

Chemical resistant protective gloves

Eye protection:

Safety glasses with side-shields.

Body protection:

light protective clothing

General safety and hygiene measures:

Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation. Wearing of closed work clothing is recommended. Wear protective clothing as necessary to minimize contact. Handle in accordance with good industrial hygiene and safety practice. No eating, drinking, smoking or tobacco use at the place of work.

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9. Physical and Chemical Properties

Form:	powder
Odour:	odourless
Odour threshold:	No applicable information available.
Colour:	off-white
pH value:	6 - 8 (10 g/l) The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.
Melting point:	The substance / product decomposes therefore not determined.
Boiling point:	not applicable
Sublimation point:	No applicable information available.
Flash point:	not applicable
Flammability:	not flammable
Lower explosion limit:	No data available.
Upper explosion limit:	No data available.
Autoignition:	No data available.
Vapour pressure:	The product has not been tested.
Bulk density:	approx. 700 kg/m ³
Vapour density:	No data available.
Partitioning coefficient n- octanol/water (log Pow):	Study scientifically not justified.
Self-ignition temperature:	not self-igniting
Viscosity, dynamic:	25 - 49 mPa.s (DIN 53019) (0.5 %(m), 25 °C)
% volatiles:	not determined
Solubility in water:	Forms a viscous solution.
Solubility (quantitative):	No data available.
Solubility (qualitative):	No data available.
Evaporation rate:	The product is a non-volatile solid.
Other Information:	If necessary, information on other physical and chemical parameters is indicated in this section.

10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:

No corrosive effect on metal.

Oxidizing properties:

not fire-propagating

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

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The product is not a dust explosion risk as supplied; however the build-up of fine dust can lead to a risk of dust explosions.

Stable under normal conditions.

No hazardous reactions known.

Conditions to avoid

Avoid extreme temperatures. Avoid humidity.

Incompatible materials

strong acids, strong bases, strong oxidizing agents

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: No hazardous decomposition products if stored and handled as prescribed/indicated.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: No known acute effects.

Oral

Type of value: LD50

Species: rat

Value: > 5,000 mg/kg (OECD Guideline 401)

Irritation / corrosion

Assessment of irritating effects: Contact with the eyes or skin may cause mechanical irritation. The product has not been tested. The statement has been derived from the properties of the individual components.

Skin

Species: rabbit

Result: non-irritant

Method: OECD Guideline 404

Eye

Species: rabbit

Result: non-irritant

Sensitization

Assessment of sensitization: Based on the ingredients, there is no suspicion of a skin-sensitizing potential.

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

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Repeated dose toxicity

Assessment of repeated dose toxicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses. The product has not been tested. The statement has been derived from the properties of the individual components.

Genetic toxicity

Assessment of mutagenicity: Based on the ingredients, there is no suspicion of a mutagenic effect.

Carcinogenicity

Assessment of carcinogenicity: The whole of the information assessable provides no indication of a carcinogenic effect.

None of the components in this product at concentrations greater than 0.1% are listed by IARC; NTP, OSHA or ACGIH as a carcinogen.

Reproductive toxicity

Assessment of reproduction toxicity: Based on the ingredients, there is no suspicion of a toxic effect on reproduction.

Teratogenicity

Assessment of teratogenicity: Based on the ingredients, there is no suspicion of a teratogenic effect.

Other Information

The product has not been tested. The statements on toxicology have been derived from products of a similar structure and composition.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11.. Further important symptoms and effects are so far not known.

12. Ecological Information

Toxicity

Toxicity to fish

LC50 (96 h) > 100 mg/l, Oncorhynchus mykiss (static)
(under static conditions in the presence of 10 mg/L humic acid)

Aquatic invertebrates

LC50 (48 h) > 100 mg/l, Daphnia magna

Persistence and degradability

Assessment biodegradation and elimination (H2O)

Not readily biodegradable (by OECD criteria).

Bioaccumulative potential

Assessment bioaccumulation potential

Based on its structural properties, the polymer is not biologically available. Accumulation in organisms is not to be expected.

Mobility in soil

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Assessment transport between environmental compartments

Information on: Anionic polyacrylamide

Adsorption to solid soil phase is expected.

Additional information

Other ecotoxicological advice:

The product has not been tested. The statements on ecotoxicology have been derived from products of a similar structure and composition.

13. Disposal considerations

Waste disposal of substance:

Must be disposed of or incinerated in accordance with local regulations.

Container disposal:

Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. Transport Information

Land transport

TDG

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

15. Regulatory Information

VOC content:

not determined

Federal Regulations

Registration status:

Chemical DSL, CA released / listed

According to Controlled Products Regulations (CPR) (SOR/88-66)

Not WHMIS controlled.

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16. Other Information

SDS Prepared by:
BASF NA Product Regulations
SDS Prepared on: 2016/02/09

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

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END OF DATA SHEET

MATERIAL SAFETY DATA SHEET**FLOTIGAM EDA**

Page 1

Substance key: SXR094488
Version : 2 - 1 / USARevision Date: 04/20/2011
Date of printing :06/29/2011**Section 01 - Product Information****Identification of the company:**Clariant Corporation
4000 Monroe Road
Charlotte, NC, 28205
Telephone No.: +1 704 331 7000**Information of the substance/preparation:**

Product Safety 1-704-331-7710

Emergency tel. number: +1 800-424-9300 CHEMTREC**Trade name:****FLOTIGAM EDA****Primary product use:**

Ore processing

Chemical family:

Based on an isodecyl ether propylene amine/amino acetate.

Section 02 - Composition information on hazardous ingredients**Hazardous ingredients:**

Component	CAS-no. (Trade secret no.)	Concentration
3-(Isodecyloxy)propylamine	30113-45-2	40 - 60 %
3-(Isodecyloxy)propylammonium acetate	28701-67-9	40 - 60 %

Section 03 - Hazards identification**Emergency overview:**Clear, colorless to pale yellow liquid; slight amine odor.
Corrosive
Harmful if swallowed.
Toxic to aquatic organisms**Expected Route of entry:****Inhalation:**

Vapors and/or mists are probably corrosive to respiratory passages, and may cause ulcerations of the nose, throat, and larynx.

Skin contact:

Corrosive to the skin.

Eye contact:

Corrosive to the eye.

Ingestion:

This material will probably cause chemical burns of the mouth, pharynx, esophagus, and stomach in humans following ingestion.

Skin absorption:

yes

Known effects on other illnesses:

Pre-existing skin and eye disorders may be aggravated by exposure to this product.

Listed carcinogen:

IARC: No

MATERIAL SAFETY DATA SHEET
FLOTIGAM EDA

Page 2

Substance key: SXR094488
Version : 2 - 1 / USARevision Date: 04/20/2011
Date of printing :06/29/2011NTP: No
OSHA: No
Other: No**HMIS:**

Health: 3

Flammability: 1

Reactivity: 0

Personal protection: X

Section 04 - First aid measures**After inhalation:**

Get victim to fresh air. Give artificial respiration or oxygen if breathing has stopped. Get prompt medical attention. Do not give fluids if victim is unconscious.

After contact with skin:

Immediately wash skin with soap and plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Seek medical attention if pain or irritation occurs.

After contact with eyes:

Flush thoroughly with water for 15 minutes. Get immediate medical help.

After ingestion:

Get immediate medical help.

Advice to doctor / Treatment:

None known.

Section 05 - Fire fighting measures

Flashpoint: > 212 °F
Method: ASTM D 93 (closed cup)

Lower explosion limit: Not applicable for Liquids with Flash Point > 70 °C.

Upper explosion limit: Not applicable for Liquids with Flash Point > 70 °C.

Ignition temperature: Not applicable for Liquids with Flash Point > 70 °C.

Hazardous combustion products:

In case of fires, hazardous combustion gases are formed:
Nitrous gases (NO_x)

Extinguishing media: water spray jet
foam
sand
carbon dioxide
dry powder

Special fire fighting procedure:

Use self-contained breathing apparatus and full protective clothing.
Use water spray to cool drums in fire area.
Avoid breathing vapors and keep upwind.

Section 06 - Accidental release measures

MATERIAL SAFETY DATA SHEET
FLOTIGAM EDA

Page 3

Substance key: SXR094488
Version : 2 - 1 / USARevision Date: 04/20/2011
Date of printing :06/29/2011**Steps to be taken in case of spill or leak:**

Contain spill. Ensure adequate ventilation and wear appropriate personal protective equipment. Collect onto inert absorbent. Place in sealable container. Do not allow to contaminate water sources or sewers.

Section 07 - Handling and storage**Advice on safe handling:**

Keep away from heat, sparks and open flames. - Avoid breathing vapors or contact with skin, eyes, and clothing.- Use only with adequate ventilation and proper protective eyewear, face shield, gloves and clothing. Wash thoroughly after handling. Keep container closed.

Further info on storage conditions:

Store in original container.
Keep from freezing.

Section 08 - Exposure controls / personal protection

No level has been established by OSHA, NIOSH, ACGIH.

Respiratory protection:	If airborne concentrations pose a health hazard, become irritating, or exceed recommended limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements under 29CFR1910.134.
Hand protection:	Nitrile Gloves.
Eye protection:	Safety glasses or chemical splash goggles.
Other protective equipment:	Clothing suitable to prevent skin contact.
IDLH:	
Not Determined	

Section 09 - Physical and chemical properties

Form:	Liquid
Color:	colourless to pale colour
Odor:	slightly ammonia-alkali like
pH:	approx. 9 (20 °C, 10 g/l) Method: ASTM E 70
Solubility in water:	Method: OECD Guide-line 105 emulsifiable
Density:	0.9 g/cm ³ (20 °C) Method: DIN 51757
Freezing point :	< -4 °F Method: OECD Guide-line 102

MATERIAL SAFETY DATA SHEET
FLOTIGAM EDA

Page 4

Substance key: SXR094488
Version : 2 - 1 / USARevision Date: 04/20/2011
Date of printing :06/29/2011

Starts to boil : approx. 482 °F
Method: OECD Guide-line 103

Viscosity / (dynamic): 110 mPa.s (20 °C)
Method: DIN 53015

Further information:
Ionic Characteristic: Cationic

Section 10 - Stability and reactivity

Thermal decomposition: > 200 °C
Method: ASTM D 3417

Chemical stability: Stable.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological information

Product information:

Acute oral toxicity: LD50 ca. 500 mg/kg (rat)
Method: OECD 423

Acute inhalation toxicity: No data available. No information on acute inhalation toxicity was found in the specialised literature.

Acute dermal toxicity: No data available. No information on acute dermal toxicity was found in the specialised literature.

Skin irritation: corrosive (rabbit)
By analogy with a similar product.

Eye irritation: corrosive
Information derived from the corrosive effect on skin

Section 12 - Ecological information

Product information:

Biodegradation: > 95 % (28 d)
readily degradable
By analogy with a similar product.

Fish toxicity: LC50 7.81 mg/l (96 h, Brachydanio rerio)
Method: OECD 203

Bacteria toxicity: EC50 49.35 mg/l (3 h, activated sludge)
By analogy with a similar product.

Chemical oxygen demand (COD): > 2,000.000 mg/l
By analogy with a similar product.

MATERIAL SAFETY DATA SHEET
FLOTIGAM EDA

Page 5

Substance key: SXR094488
Version : 2 - 1 / USARevision Date: 04/20/2011
Date of printing :06/29/2011**Remarks:**

Do not dispose of in the environment.

Section 13 - Disposal considerations**Waste disposal information:**

Consult local, state, and federal regulations.

Recommended disposal is by incineration in approved facilities.

RCRA hazardous waste:

No -- Not as sold.

RCRA number: NONE

Section 14 - Transport information**DOT Regulation:**

Proper shipping name:	Amines, liquid, corrosive, n.o.s.
Hazard class:	8
Packing group:	II
UN/NA-number:	UN 2735
Primary hazard class:	8
Technical Name:	Alkyletheramine

IATA

Proper shipping name:	Amines, liquid, corrosive, n.o.s.
Class:	8
Packing group:	II
UN/ID number:	UN 2735
Primary risk:	8
Remarks:	Shipment permitted
Hazard inducer(s):	Alkyletheramine

IMDG

Proper shipping name:	Amines, liquid, corrosive, n.o.s.
Class:	8
Packing group:	II
UN no.:	UN 2735
Primary risk:	8
Hazard inducer(s):	Alkyletheramine
Marine pollutant:	Marine Pollutant
EmS:	F-A S-B

Section 15 - Regulatory information**TSCA Status:**

All components of this product are listed on the TSCA Inventory.

SARA (section 311/312):

Reactive hazard:	no
Pressure hazard:	no
Fire hazard:	yes
Immediate/acute:	yes

MATERIAL SAFETY DATA SHEET
FLOTIGAM EDA

Page 6

Substance key: SXR094488
Version : 2 - 1 / USARevision Date: 04/20/2011
Date of printing :06/29/2011

Delayed/chronic: no

SARA 313 information:

This product does not contain any toxic chemical listed under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986.

Clean Water Act:

Contains no known priority pollutants at concentrations greater than 0.1%.

Section 16 - Other information**Label information:**

DANGER!

CORROSIVE TO SKIN AND EYES CAUSES BURNS HARMFUL IF SWALLOWED
THIS MATERIAL IS TOXIC TO AQUATIC ORGANISMS.

Avoid breathing vapor or mist. Avoid contact with skin and eyes. Avoid mist formation. Keep container closed when not in use. Keep away from heat, sparks and flame. Use ventilation and/or respiratory protection to keep exposure to a minimum.

Eye contact: flush with water for at least 15 minutes while holding eyelids open. Seek immediate medical attention. Skin contact: wash thoroughly with soap and water for 15 minutes. If skin irritation occurs, seek medical attention. Wash contaminated clothing before reuse. Ingestion: seek medical attention immediately. Inhalation: remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and seek medical attention.

This information is supplied under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, and is offered in good faith based on data available to us that we believe to be true and accurate. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable to the material. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate for that use. No warranty, express or implied, is made regarding the accuracy of this data, the hazards connected with the use of the material, or the results to be obtained from the use thereof. We assume no responsibility for damage or injury from the use of the product described herein. Data provided here are typical and not intended for use as product specifications.

SAFETY DATA SHEET

Version 6.1
Revision Date 01/15/2020
Print Date 02/08/2020

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifiers**

Product name : 4-Methyl-2-pentanol

Product Number : 109916

Brand : Aldrich

Index-No. : 603-008-00-8

CAS-No. : 108-11-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765

Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Flammable liquids (Category 3), H226

Eye irritation (Category 2A), H319

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Warning

Hazard statement(s)

H226

Flammable liquid and vapour.

H319

Causes serious eye irritation.

H335	May cause respiratory irritation.
Precautionary statement(s)	
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

May form explosive peroxides.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	: Isobutyl methyl carbinol
Formula	: C ₆ H ₁₄ O
Molecular weight	: 102.17 g/mol
CAS-No.	: 108-11-2
EC-No.	: 203-551-7
Index-No.	: 603-008-00-8

Component	Classification	Concentration
4-Methylpentan-2-ol		
	Flam. Liq. 3; Eye Irrit. 2A; STOT SE 3; H226, H319, H335	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Dry powder Dry sand

Unsuitable extinguishing media

Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
4-Methylpentan-2-ol	108-11-2	TWA	25 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Danger of cutaneous absorption		
		STEL	40 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Danger of cutaneous absorption		
		TWA	25 ppm 100 mg/m ³	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation The value in mg/m ³ is approximate.		

		TWA	25 ppm 100 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	40 ppm 165 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		PEL	25 ppm 100 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		STEL	40 ppm 165 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.4 mm

Break through time: 480 min

Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.2 mm

Break through time: 30 min

Material tested: Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance	Form: liquid Colour: colourless
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	Melting point/range: -90 °C (-130 °F) - lit.
f) Initial boiling point and boiling range	132 °C 270 °F - lit.
g) Flash point	41 °C (106 °F) - closed cup
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	Upper explosion limit: 5.5 %(V) Lower explosion limit: 1 %(V)
k) Vapour pressure	4.9 hPa at 20 °C (68 °F)
l) Vapour density	4.09
m) Relative density	0.802 g/cm ³ at 25 °C (77 °F)
n) Water solubility	21.8 g/l at 20 °C (68 °F) - OECD Test Guideline 105 - soluble
o) Partition coefficient: n-octanol/water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available

t) Oxidizing properties No data available

9.2 Other safety information

Relative vapour density 4.09

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

Test for peroxide formation before distillation or evaporation. Test for peroxide formation or discard after 1 year.

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 2,590 mg/kg

(OECD Test Guideline 401)

Inhalation: No data available

LD50 Dermal - Rabbit - 2,870 mg/kg

(OECD Test Guideline 402)

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 4 h

(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Irritating to eyes.

(OECD Test Guideline 405)

Respiratory or skin sensitisation

Maximisation Test - Guinea pig

Result: Does not cause skin sensitisation.
(OECD Test Guideline 406)

Germ cell mutagenicity

Ames test
S. typhimurium
Result: negative

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available
No data available

Specific target organ toxicity - single exposure

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: SA7350000

Central nervous system depression, depression, narcosis, lowering of blood pressure due to cardiac depression, relaxing of smooth muscle in all regions and depressed skeletal muscle without influencing nerves.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	semi-static test LC50 - Pimephales promelas (fathead minnow) - 359 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	semi-static test EC50 - Daphnia magna (Water flea) - 337 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test EC50 - Pseudokirchneriella subcapitata - 264 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	Respiration inhibition EC50 - Sludge Treatment - > 100 mg/l - 3 h (OECD Test Guideline 209)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 85 % - Readily biodegradable.
------------------	---

Ratio BOD/ThBOD 85 %

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Contact a licensed professional waste disposal service to dispose of this material. Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

UN number: 2053 Class: 3 Packing group: III
Proper shipping name: Methyl isobutyl carbinol
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG

UN number: 2053 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: METHYL ISOBUTYL CARBINOL

IATA

UN number: 2053 Class: 3 Packing group: III
Proper shipping name: Methyl isobutyl carbinol

SECTION 15: Regulatory information

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

4-Methylpentan-2-ol

CAS-No.
108-11-2

Revision Date
1993-04-24

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.1

Revision Date: 01/15/2020

Print Date: 02/08/2020

SAFETY DATA SHEET

PIONERA F-100 Powder

Last changed: 02/07/2012

Replaces date: 04/01/2012

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

TRADE NAME PIONERA F-100 Powder
APPLICATION AREA Flotation depressant with selectivity for Clay, Calcite and Barite

NATIONAL MANUFACTURER/IMPORTER

Enterprise Borregaard AS
Address P.O.Box 162
Country NORWAY
Telephone +47 69 11 80 00
Fax +47 69 11 86 40

CONTACT PERSONS

Name	E-mail	Telephone	Country
Nina Faye Haraldstad	MSDS@borregaard.com		

Emergency Phone	Type of assistance	Opening Hours
112	Emergency	24 h

2. HAZARDS IDENTIFICATION

GENERAL

Not classified. Avoid generation and spreading of dust.

HEALTH

Avoid handling which leads to dust formation.

FIRE AND EXPLOSION

Note the risk of dust explosion.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient name	Reg.No	EC No.	CAS No.	Conc. (wt %)	Classification
Chemically modified natural polymer				> 90 %	

4. FIRST AID MEASURES

INHALATION

Move the exposed person to fresh air at once.

SKIN CONTACT

Rinse the skin immediately with lots of water.

EYE CONTACT

Rinse immediately with plenty of water. Remove any contact lenses and rinse with water for at least 15 minutes (keep the eyelids open).

INGESTION

Drink plenty of water. Contact physician if symptoms appears.

5. FIRE-FIGHTING MEASURES

SAFETY DATA SHEET

PIONERA F-100 Powder

Last changed: 02/07/2012

Replaces date: 04/01/2012

EXTINGUISHING MEDIA

Can be extinguished with water, powder, alcohol-resistant foam or carbon dioxide.

IMPROPER EXTINGUISHING MEDIA

Avoid water in straight hose stream; will scatter and spread fire.

FIRE AND EXPLOSION HAZARDS

High concentrations of dust may form explosive mixture with air. ($t > 450^{\circ}\text{C}$). Fire causes formation of toxic gases.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS

Use a respirator and other protective equipment.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Mechanical ventilation or local exhaust ventilation is required. Avoid generation and spreading of dust.

SAFETY ACTIONS TO PROTECT EXTERNAL ENVIRONMENT

Prevents major discharge into sewage systems, groundwater and surface water. Provide ventilation and confine spill. Do not allow runoff to sewer.

METHODS FOR CLEANING UP

Collect with vacuum cleaner or carefully sweep together and collect. Avoid generation and spreading of dust. Rinse clean with water. Collect in containers and seal securely.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS

Preparation has low toxicity, therefore risk of damage is limited in normal handling.

HANDLING ADVICE

Provide sufficient ventilation for operations causing dust formation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE

Keep container dry.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE CONTROL

Provide good ventilation.

RESPIRATORY PROTECTION

Wear respirator if there is dust formation.

EYE PROTECTION

Use approved safety goggles or face shield.

HAND PROTECTION

No specific hand protection noted, but gloves may still be advisable.

PROTECTIVE CLOTHING

Wear suitable protective clothing.

SAFETY DATA SHEET

PIONERA F-100 Powder

Last changed: 02/07/2012

Replaces date: 04/01/2012

OEL value

Ingredient name	CAS no.	Range	ppm	mg / m3	Year	Notification
Nuisance dust, total		8 h		10	2010	

R=Toxic for reproduction, H=Skin absorption, K=Carcinogenic, A=Sensitising, T=Upper limit, M=Mutagenic

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE Powder.

COLOUR Brown.

ODOUR Mild.

SOLUBILITY Water soluble.

Physical and chemical parameters

Parameter	Value / unit	Method / reference	Observation
pH in solution	~ 8.50		

10. STABILITY AND REACTIVITY

STABILITY

Stable under recommended storage and handling conditions.

CONDITIONS TO AVOID

No information available

MATERIALS TO AVOID

No information available

HAZARDOUS DECOMPOSITION PRODUCTS

No dangerous reactions known.

11. TOXICOLOGICAL INFORMATION

SKIN CONTACT

OECD 404, "Not classified as irritating to skin". Non-irritant.

EYE CONTACT

OECD-test 405: "Not classified as eye irritant". Non-irritant.

SENSITISATION

No known information.

ACUTE AND CHRONIC TOXICITY

No known information.

12. ECOLOGICAL INFORMATION

MOBILITY

Water soluble.

DEGRADABILITY

Expected to be readily biodegradable.

SAFETY DATA SHEET

PIONERA F-100 Powder

Last changed: 02/07/2012

Replaces date: 04/01/2012

CONCLUSION

Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS

GENERAL REGULATIONS

Dump or destroy in accordance with official recommendations and applicable legislation.

14. TRANSPORT INFORMATION

Classified as Dangerous Goods: No

OTHER INFORMATION

Class 55

Harmonized Tariff Code for US:3804.00.1000-0

15. REGULATORY INFORMATION

EC-Label: No

REFERENCES

GLOBAL CHEMICAL INVENTORY STATUS

Country List Status

United States Toxic Substance Control Act (TSCA) Included

Canada Domestic Substance List (DSL) Included

Europe European Inventory of Existing Chemical Substances (EINECS) Exempt - Polymer

Australia Australian Inventory of Chemical Substances (AICS) Included

Japan Existing and New Chemical List (ENCS) Included

Korea Korean Existing Chemical List (ECL) Included

Philippines Philippine Inventory of Chemicals and Chemical Substances (PICCS) Included

China Chemical Inventory INV (CN) - IECSC Included

New Zealand New Zealand Inventory of Chemicals (NZIoC) Included

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). This material is not known to contain any

chemicals, currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to

the proposition.

Not classified as dangerous for supply or conveyance - Marpol, Annex II, Appendix III.

Regulation (EC) 1907/2006 (REACH) (September 2008)

16. OTHER INFORMATION

VENDOR NOTES

Information is based on our present knowledge and applies product in delivered form. The meaning is to describe our products safety demand and not its characteristics. It is the responsibility of the recipient of this safety data sheet to ensure that information given here is read and understood by all who use, handle, dispose of or in any way come in contact with the product. The information given in this SDS is based on our present knowledge and describe security for our products. It is not a sales specification. Assessed on the basis of available data

ISSUED: 04/01/2012

REVISION HISTORY

Version	Rev. date	Responsible	Changes
0.0.2	02/07/2012	Borregaard AS	Updated according to current regulations (NIHA)

SAFETY DATA SHEET

PIONERA F-100 Powder

Last changed: 02/07/2012

Replaces date: 04/01/2012



Material Safety Data Sheet

DENSE SODA ASH

A. PRODUCT INFORMATION

TRADE NAME (PRODUCT IDENTIFIER): SODA ASH		CLASSIFICATION & SYMBOL: Class <u>D2B</u> 	
CHEMICAL NAME AND/OR SYNONYM: Sodium Carbonate		FORMULA: Na ₂ CO ₃	CAS NO: 497-19-8
PRODUCT USE: Soda salts; glass; soap, cleaners and water softeners; pulp and paper; photographic agent.			
MANUFACTURER/IMPORTER: General Chemical Performance Products, Ltd. 201 City Centre Drive Mississauga, Ontario L5B 3A3		SUPPLIER/DISTRIBUTOR: General Chemical Performance Products, Ltd. 201 City Centre Drive Mississauga, Ontario L5B 3A3	
EMERGENCY TELEPHONE NO: 866-543-3896			

B. PREPARATION INFORMATION

PREPARED BY: General Chemical Corporation Product Safety Department 973-515-1840	PREVIOUS ISSUE DATE: 4/00
	CURRENT ISSUE DATE: 6/01

C. TOXICOLOGICAL PROPERTIES

INHALATION: Inhalation of product may irritate nose, throat, and lung.	
INGESTION: Although low in toxicity, ingestion can be harmful. May cause nausea, vomiting, stomachache, and diarrhea.	
SKIN: May cause skin irritation from prolonged contact, especially in hot weather. Dermal (rodent-rabbit) 500 mg/24 Hr-mild irritation. Standard draize test.	
EYES: May irritate or burn eyes.	
ACUTE TOXICITY: Moderately toxic LD ₅₀ (rat): 2800 mg/kg. See section K	EXPOSURE LIMITS: Ontario Ministry of Labour Time-Weighted Average Exposure Value (TWAEV) for Nuisance Particulate is 10 mg/m ₃ .
CHRONIC TOXICITY: Excessive contact may produce "soda ulcers" on hands and perforation of the nasal septum. Sensitivity reactions may occur from prolonged and repeated exposure.	
OTHER: Not available.	BIOLOGICAL EXPOSURE INDICES (BEI): NA

D. PHYSICAL DATA

MATERIAL IS AT NORMAL CONDITIONS: LIQUID ☐ SOLID ☒ GAS ☐ ☐ _____	APPEARANCE AND COLOR: Odorless, white powder	ODOR THRESHOLD: NA
BOILING POINT: °C FREEZING POINT: 854°C (MELTING POINT)	SPECIFIC GRAVITY: g/cc (H₂O = 1) 2.533 @ 25 °C	VAPOR DENSITY: (AIR =1) Not available
SOLUBILITY IN WATER: 17 % solution @ 20 °C	pH 1 % solution ; pH = 11.3 38% solution; pH = 11.8	VAPOR PRESSURE: (MM Hg @ 20°C not available (PSIG))
EVAPORATION RATE: (Ether = 1.0) Not available	% VOLATILES BY VOLUME: (AT 20°C) Not available	MOLECULAR WEIGHT: 105.99

E. REACTIVITY DATA

STABILITY: UNSTABLE ☐ STABLE ☒	CONDITIONS TO AVOID: Simultaneous exposure to soda ash and lime dusts (CaO). In the presence of moisture (i.e. perspiration) the two materials combine to form corrosive caustic soda (NaOH) which may cause burns.
INCOMPATIBILITY (MATERIALS TO AVOID): Contact with acids will release carbon dioxide gas. Can react violently with red hot aluminum metal; fluorine gas; lithium; and 2,4,6-trinitrotoluene.	
HAZARDOUS DECOMPOSITION PRODUCTS: Heating soda ash liberates CO ₂ Na ₂ CO ₃ (solid) = Na ₂ O (solid) + CO ₂ (gas)	
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR ☒ MAY OCCUR ☐	OTHER PRECAUTIONS: When dissolving, add to water cautiously and with stirring; solutions can get hot.

F. FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY: NA	FLASH POINT: METHOD Not applicable
HAZARDOUS COMBUSTION PRODUCTS: See Section E. Hazardous Decomposition Products.	
UPPER FLAMMABLE LIMIT: LOWER FLAMMABLE LIMIT: AUTOIGNITION TEMPERATURE:	% BY VOL. IN AIR Not applicable
EXPLOSION HAZARDS: NA	
SENSITIVITY TO MECHANICAL IMPACT: Not applicable	
SENSITIVITY TO STATIC DISCHARGE: Not applicable	
FIRE EXTINGUISHING PROCEDURES: Using extinguishing media appropriate for surrounding fire. For fire fighting wear NIOSH-approved, self-contained breathing apparatus.	

G. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

MATERIAL OR COMPONENT/C.A.S. #	CONCENTRATION	HAZARD DATA
Not applicable		

H. PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION:

For dusty or misty conditions, wear NIOSH-approved dust or mist respirator.

EYES AND FACE:

For dusty or misty conditions, or when handling solutions where there is reasonable probability of eye contact, wear chemical safety goggles and hard hat. Under these conditions do not wear contact lenses.

HANDS, ARMS, AND BODY:

As a minimum, wear long-sleeve shirts, trousers, and gloves for routine product use. Cotton gloves permitted for dry product, impervious gloves when handling solutions.

STORAGE:

Cool, dry area away from acids. Prolonged storage may cause product to cake and become wet from atmospheric moisture.

NORMAL HANDLING:

Avoid contact with eyes or prolonged skin contact. Avoid breathing dust. Use good personal hygiene and housekeeping.

ENGINEERING CONTROLS:

Ventilation: **Local Exhaust:** In all areas where dusty or misty conditions prevail.
Natural Ventilation: Adequate for other areas
Eye wash facility should be provided in storage and general work area.

ENVIRONMENTAL:

DEGRADABILITY:

Not available.

AQUATIC TOXICITY:

TL_m 48 hr. mosquito-fish = 840 mg/1
TL_m 96 hr. mosquito-fish = 1200 mg/1

SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT):

Shovel up dry chemical and place into an empty container with cover. Cautiously spray residue with plenty of water. Keep contaminated water from entering showers and water courses.

WASTE DISPOSAL:

Consistent with the requirements of local waste disposal authorities. If permitted by applicable disposal regulations, bury in a solid waste landfill or dissolve and neutralize as follows: Dissolve in water using caution as solution can get hot. Neutralize with acid and flush to sewer with plenty of water. Good ventilation is required during neutralization due to release of CO₂ gas. Neutralized waste may have to be disposed of by an approved contractor.

CANADIAN SHIPPING INFORMATION:

TDGA CLASS: NA	PIN: NA	LABEL: NA
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I. FIRST AID MEASURES**INHALATION:**

Promptly remove to fresh air. Restore and/or support breathing. Consult a physician for observation and treatment.

INGESTION:

If conscious give 2-3 glasses of water to drink to dilute the material. DO NOT INDUCE VOMITING. Contact a physician.

SKIN:

Remove contaminated clothing. Wash affected area of skin with soap and plenty of water. Get medical attention if irritation persists.

EYES:

Flush eyes promptly with plenty of running water, continuing at least 15 minutes. Get medical attention.

- J.** Soda ash is produced in two principal grades: Light soda ash and Dense soda ash. These grades differ only in physical characteristics such as bulk density and size and shape of particles, which influence flow characteristics and angle of response. Other physical properties, as well as chemical properties and properties of solutions, are common to both grades of soda ash.
- K.** LC50 (guinea pig) : 800 mg/m³, 20-hr exposure
The study was based on the effects of sodium combustion products which included sodium hydroxide and sodium carbonate. The test aerosols, however, consisted of <4 micrometer diameter particles which are much smaller than the smallest particle in this product.

THIS MATERIAL SAFETY DATA SHEET IS OFFERED FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION AS REQUIRED BY FEDERAL HAZARDOUS PRODUCTS ACT AND RELATED LEGISLATION. THE INFORMATION IS BELIEVED TO BE ACCURATE BUT GENERAL CHEMICAL CANADA LTD. PROVIDES NO WARRANTIES, EITHER EXPRESSED OR IMPLIED.

SAFETY DATA SHEET

Creation Date 16-June-2009

Revision Date 14-January-2019

Revision Number 6

1. Identification

Product Name Sodium hydroxide

Cat No. : AC206060000; AC206060010; AC206060025; AC206060250;
AC206060100

CAS-No 1310-73-2
Synonyms Caustic soda

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet**Company**

Importer/Distributor
Fisher Scientific
112 Colonnade Road,
Ottawa, ON K2E 7L6,
Canada
Tel: 1-800-234-7437

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Manufacturer
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) identification**Classification****WHMIS 2015 Classification**

Classified as hazardous under the Hazardous Products Regulations (SOR/2015-17)

Corrosive to metals	Category 1
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements**Signal Word**

Danger

Hazard Statements

May be corrosive to metals

Causes severe skin burns and eye damage
May cause respiratory irritation

**Precautionary Statements****Prevention**

Keep only in original container
Do not breathe dust/fumes/gas/mist/vapours/spray
Wash face, hands and any exposed skin thoroughly after handling
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection

Response

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
IF INHALED: Remove person to fresh air and keep comfortable for breathing
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a POISON CENTER/doctor
Wash contaminated clothing before reuse
Absorb spillage to prevent material damage

Storage

Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in corrosive resistant polypropylene container with a resistant inliner
Store in a dry place

Disposal

Dispose of contents/container to an approved waste disposal plant

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Sodium hydroxide	1310-73-2	100

4. First-aid measures

General Advice

Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required. Keep eye wide open while rinsing.

Skin Contact

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.

Inhalation

Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or Poison Control Center immediately.

Ingestion

Do not induce vomiting. Immediate medical attention is required. Never give anything by mouth to an unconscious person. Drink plenty of water.

Most important symptoms/effects	Causes burns by all exposure routes. . Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	CO ₂ , dry chemical, dry sand, alcohol-resistant foam.
Unsuitable Extinguishing Media	Do not use a solid water stream as it may scatter and spread fire
Flash Point	No information available
Method -	No information available
Autoignition Temperature	
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

The product causes burns of eyes, skin and mucous membranes.

Hazardous Combustion Products

Sodium oxides Hydrogen

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
3	0	1	N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment. Evacuate personnel to safe areas. Avoid contact with skin, eyes and clothing.
Environmental Precautions	Do not allow material to contaminate ground water system. Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information.
Methods for Containment and Clean Up	Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal.

7. Handling and storage

Handling	Wear personal protective equipment. Use only under a chemical fume hood. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Do not ingest.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

8. Exposure controls / personal protection

Exposure Guidelines

Component	Alberta	British Columbia	Ontario TWA EV	Quebec	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium hydroxide	Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	CEV: 2 mg/m ³	Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³ TWA: 2 mg/m ³	IDLH: 10 mg/m ³ Ceiling: 2 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures

Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment**Eye Protection**

Goggles

Hand Protection

Wear appropriate protective gloves and clothing to prevent skin exposure.

Glove material	Breakthrough time	Glove thickness	Glove comments
Neoprene	> 480 minutes	0.45 mm	As tested under EN374-3
Butyl rubber	> 480 minutes	0.35 mm	Determination of Resistance to Permeation by Chemicals

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Recommended Filter type: Particulates filter conforming to EN 143

When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls

Prevent product from entering drains.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Wash hands before breaks and at the end of workday.

9. Physical and chemical properties

Physical State	Solid
Appearance	White
Odor	Odorless
Odor Threshold	No information available
pH	14 (5 %)
Melting Point/Range	318 °C / 604.4 °F
Boiling Point/Range	1390 °C / 2534 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	Not applicable
Flammability (solid,gas)	Not flammable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	1 mbar @ 700 °C
Vapor Density	Not applicable

Specific Gravity	No information available
Bulk Density	2.13 g/cm ³
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	H Na O
Molecular Weight	40

10. Stability and reactivity

Reactive Hazard	Yes
Stability	Stable under normal conditions.
Conditions to Avoid	Incompatible products. Excess heat.
Incompatible Materials	Strong oxidizing agents, Acids, Metals, Water
Hazardous Decomposition Products	Sodium oxides, Hydrogen
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium hydroxide	140 - 340 mg/kg (Rat)	1350 mg/kg (Rabbit)	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation	Causes severe burns by all exposure routes
Sensitization	No information available
Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Sodium hydroxide	1310-73-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects, both acute and Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

delayed Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium hydroxide	Not listed	LC50: = 45.4 mg/L, 96h static (Oncorhynchus mykiss)	Not listed	Not listed

Persistence and Degradability Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1823
 Proper Shipping Name SODIUM HYDROXIDE, SOLID
 Hazard Class 8
 Packing Group II

TDG

UN-No UN1823
 Proper Shipping Name SODIUM HYDROXIDE, SOLID
 Hazard Class 8
 Packing Group II

IATA

UN-No UN1823
 Proper Shipping Name Sodium hydroxide, solid
 Hazard Class 8
 Packing Group II

IMDG/IMO

UN-No UN1823
 Proper Shipping Name Sodium hydroxide, solid
 Hazard Class 8
 Packing Group II

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	DSL	NDSL	TSCA	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Sodium hydroxide	X	-	X	215-185-5	-		X	X	X	X	X

Canada

SDS in compliance with provisions of information as set out in Canadian Standard - Part 4, Schedule 1 and 2 of the Hazardous Products Regulations (HPR) and meets the requirements of the HPR (Paragraph 13(1)(a) of the Hazardous Products Act (HPA)).

16. Other information

Prepared By	Regulatory Affairs Thermo Fisher Scientific Email: EMSDS.RA@thermofisher.com
Creation Date	16-June-2009
Revision Date	14-January-2019
Print Date	14-January-2019
Revision Summary	This document has been updated to comply with the requirements of WHMIS 2015 to align with the Globally Harmonised System (GHS) for the Classification and Labelling of Chemicals.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

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539 **APPENDIX D NC DAQ PERMIT APPLICABILITY DETERMINATION LETTER**

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ROY COOPER
Governor

ELIZABETH S. BISER
Secretary

MICHAEL ABRACZINSKAS
Director



February 9, 2023

Mr. John Kuhn
Environmental Manager
Albemarle Kings Mountain Lithium/Spodumene Mining Facility
348 Holiday Inn Drive
Kings Mountain, NC 28086

SUBJECT: Permit Applicability Determination
Applicability Determination No. 3910
Albemarle Kings Mountain Lithium/Spodumene Mining Facility
Kings Mountain, Cleveland County

Dear Mr. Kuhn:

On January 8, 2023, the Division of Air Quality (DAQ) received an applicability determination request from Albemarle, USA, Inc. (Albemarle) regarding a proposed lithium mining project. Albemarle is the parent company of the Albemarle Kings Mountain Facility (the Kings Mountain Facility), which currently holds Air Permit No. 02894R36 for a lithium compound production facility in Kings Mountain, Cleveland County, NC. Albemarle is proposing to reopen an existing lithium (spodumene) mine and to construct a new concentrator plant located within the footprint of its Albemarle Kings Mountain site in Cleveland County. Albemarle is requesting DAQ to determine whether the proposed mine/concentrator plant would be considered a separate stationary source under Prevention of Significant Deterioration (PSD) rules from the existing Kings Mountain Facility.

The proposed project would encompass the existing Kings Mountain Lithium Mine, which has been inactive since 1990. Albemarle is proposing to reopen this mine and construct a new Concentrator Plant to process the mine output to produce concentrated spodumene ore. The mining operation would separate the spodumene ore from the overburden (i.e., a rocky/soil waste material), with the spodumene ore providing feedstock for the newly constructed Concentrator Plant. The Concentrator Plant would then produce concentrated lithium ore known as "spodumene concentrate" by mechanical separation processes, including flotation.

Albemarle indicated the existing Kings Mountain Facility is incapable of processing the spodumene concentrate. The output from proposed mine and Concentrator Plant would be a mineral product. The existing facility is a chemical plant using chemical raw materials rather than mineral raw materials, and it lacks the equipment necessary to process mineral products from the proposed mine/concentrator plant.

A stationary source under PSD rules is defined as any building, structure, facility, or installation that emits or may emit a regulated New Source Review pollutant. This definition is further specified to mean "all pollutant-emitting activities that belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same Major Group (i.e., which have the same two-digit code)" (40 CFR 51.166(b)(5) and (6)).



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DAQ must assess three factors – 1) under common control, 2) located on contiguous or adjacent properties, and 3) within the same industrial grouping – to determine whether or not the proposed project should be considered a single stationary source with the existing Kings Mountain Facility. Each factor is discussed in more detail in the following paragraphs.

Common Control

The Kings Mountain Facility and the proposed mine/concentrator plant would be under common control as both would be owned and operated by Albemarle U.S., Inc.

Contiguous or Adjacent Properties

The Kings Mountain Facility and the proposed mine/concentrator plant would both be located within the existing footprint of the approximately 800-acre Albemarle Kings Mountain Site in Cleveland County. As such, they would be considered “contiguous or adjacent” properties.

Same Industrial Group

The Standard Industrial Classification (SIC) code for the Kings Mountain Facility is 2819 – Industrial Inorganic Chemicals, Not Elsewhere Classified. This group represents establishments primarily engaged in manufacturing industrial inorganic chemicals, not elsewhere classified. “Lithium compounds” and “lithium metals” are included in SIC code 2819.

The proposed lithium mine and concentrator plant would be classified as non-metallic mineral mining, as defined by the two-digit SIC code 14 – Mining and Quarrying of Nonmetallic Minerals, Except Fuels. This Major Group includes establishments primarily engaged in mining or quarrying, developing mines, or exploring for nonmetallic minerals, except fuels. Also included in this Major Group are certain well and brine operations, and primary preparation plants, such as those engaged in crushing, grinding, washing, or other concentration. The facility would be further classified by SIC code 1479 – Chemical and Fertilizer Mineral Mining, Not Elsewhere Classified, which includes “lithium mineral mining” and “spodumene mining.”

Pollutant-emitting activities are considered to be part of the same industrial grouping for PSD purposes if they have the same first two digit SIC code. Therefore, the proposed mine and concentrator plant (classified under “14”) would be in a different industrial grouping than the Kings Mountain Facility (classified under “28”).

Another item to consider in determining the stationary source status of the facilities is the support relationship between the facilities. A “support facility” is considered to be part of the same industrial grouping as that of the primary facility it supports even if the support facility has a different two digit SIC code. Support facilities are typically those which convey, store, or otherwise assist in the production of the principal product.¹ As noted above, the output of the proposed mine/concentrator plant cannot be processed in any of the existing processes at the Kings Mountain Facility, and the existing facility would not provide raw material, utilities, or assist the proposed mine/concentrator in any way. Therefore, neither facility would be considered as a support facility for the other.

¹ “Support Facility Determination: Oscar Mayer and Madison Gas and Electric,” retrieved from <https://www.epa.gov/sites/default/files/2015-07/documents/oscar.pdf>

Mr. Kuhn
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Although under “common control” and on “contiguous or adjacent property” as the existing Kings Mountain Facility, the proposed mine/concentrator plant would be a separate stationary source under PSD because the proposed project and the existing facility would operate under different SIC codes, and neither would serve as a support facility for the other.

If you have any questions regarding this determination, please feel free to contact Ms. Betty Gatano, P.E. at (919) 707-8736.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Mark J. Cuilla', is positioned above the typed name.

Mark J. Cuilla, EIT, CPM, Chief, Permitting Section
Division of Air Quality, NCDEQ

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APPENDIX E NC DAQ ZONING CONSISTENCY DETERMINATION

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