Major Source Operating Permit
Major Modification
[Month, Day] 2025

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STATEMENT OF BASIS

The proposed Title V Major Source Operating Permit (MSOP) modification is issued under the provisions of ADEM Admin. Code. r. 335-3-16.

Pemco International ("Pemco") operates an existing frit manufacturing facility located in Leesburg, Cherokee County, Alabama ("the facility"). The facility currently holds MSOP No.: 303-0001, issued January 28, 2022, and is comprised of the following processes:

Smelters S2, S3, S4 & Auxiliary Equipment	Weighing Operations
Mills	Glass Color Concentrate Production
Mixers	Emergency Generator
Screening and Bagging	

The facility is located in Cherokee County, which is currently classified as attainment/unclassifiable with the National Ambient Air Quality Standards (NAAQS) for all pollutants. There are no current or ongoing enforcement actions against the facility necessitating additional requirements to achieve compliance with the proposed permit conditions. The enforcement and compliance history for the facility can be found at https://echo.epa.gov/ (Search using Facility ID AL0000000101900001).

The current version of MSOP No.: 303-0001 restricts Pemco to routing a maximum of two smelters to a single scrubber. Pemco was issued a letter conditionally allowing three smelters to be routed to a single scrubber on January 8, 2024. Pemco conducted performance tests demonstrating compliance with the emission standards for the scrubbers while routing three smelters and a single scrubber on May 14, 15, and 16, 2024.

On July 8, 2024, Pemco submitted a permit modification request to modify MSOP No.: 303-0001 to make the following changes:

- Remove emission standard 3 for Smelters S2, S3, and S4 to allow for the operation of all three smelters when routed to a single scrubber.
- Add a new emission monitoring requirement to perform daily instantaneous visible emission checks when three smelters are routed to a single scrubber.

Additionally, due to the removal and enclosure of several units, the Department requested that Pemco submit an updated list of the units that are still on-site and operational. This list is available in the permit application for this project. Units that Pemco does not intend to operate in the future or have been removed from the site have been removed from the MSOP.

General Permit Proviso 4(a) of the current MSOP for this facility states in part: "The permittee shall comply with all conditions of ADEM Admin. Code 335-3." ADEM Admin. Code r. 335-3-14-.01(1)(c) states that any emitting equipment which is not presently operating but which is capable of being operated may restart only if its owner or operator obtains an Air Permit prior to restarting. Additionally, ADEM Admin. Code r. 335-3-14-.02(5)(a) states that Air Permits shall expire immediately following the issuance of a MSOP which pertains to that equipment, meaning that prior Air Permits authorizing construction and operation of these units are no longer extant. Since the equipment removed is not authorized to operate by inclusion in the facility's MSOP, all prior Air Permits have expired, and Pemco has not obtained any new Air Permits for these units, these units lack any legal authority to operate, and, therefore, do not possess the potential to emit air pollutants.

A complete permit application for this project was received on March 26, 2025.

NOTABLE CHANGES

In this modification, the following changes will be made:

- 40 CFR 63 Subpart CCCCCCC Updates:
    - The 40 CFR 63 Subpart CCCCCCC [MACT 7C] requirements for the Smelters, S2, S3, S4 & Auxiliary Equipment; Mills; Mixers; Screening and Bagging; and Weighing Operations have been updated to specifically list the requirements shown below. Since the equipment was previously subject to MACT 7C, these requirements were already applicable. No changes were made to the applicability of MACT 7C to Pemco's equipment.
        - Emission Standards:
            - The following requirements were referenced by the 40 CFR §63.11601(a) requirement, but are now specifically listed in each applicable permit section:
                - The Permittee must add the dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel and operate a capture system that minimizes fugitive particulate emissions during the addition of dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling process [40 CFR §63.11601(a)(1)].
                - The Permittee must capture particulate emissions and route them to a particulate control device meeting the requirements of 40 CFR §63.11601(a)(5) during the addition of dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel to a process vessel. This requirement does not apply to pigments and other solids that are in paste, slurry, or liquid form [40 CFR §63.11601(a)(2)].
                - The Permittee must meet one of the following requirements [40 CFR §63.11601(a)(3)]:
                    - Capture particulate emissions and route them to a particulate control device meeting the requirements of 40 CFR §63.11601(a)(6) during the addition of dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel to the grinding and milling process; or [40 CFR §63.11601(a)(3)(i)]
                    - Add pigments and other solids that contain compounds of cadmium, chromium, lead, or nickel to the grinding and milling process only in paste, slurry, or liquid form [40 CFR §63.11601(a)(3)(ii)].
                - The Permittee must meet one of the following requirements [40 CFR §63.11601(a)(4)]:
                    - Capture particulate emissions and route them to a particulate control device meeting the requirements of 40 CFR §63.11601(a)(5) during the grinding and milling of materials containing compounds of cadmium, chromium, lead, or nickel; or [40 CFR §63.11601(a)(4)(i)]

- Fully enclose the grinding and milling equipment during the grinding and milling of materials containing compounds of cadmium, chromium, lead, or nickel; or [40 CFR §63.11601(a)(4)(ii)]
- Ensure that the pigments and solids are in the solution during the grinding and milling of materials containing compounds of cadmium, chromium, lead, or nickel [40 CFR §63.11601(a)(4)(iii)].

o The visible emissions from particulate control device exhaust must not exceed 10-percent opacity [40 CFR §63.11601(a)(5)].

- This requirement is listed in the current permit, but it does not apply to units that do not vent to the atmosphere. Pemco's application lists several control devices that vent indoors, so the permit was updated to specifically list the control devices that are subject to this requirement.

- Compliance Test Methods and Procedures.:
  - Updated the text of the 40 CFR §63.11602(a) requirement to specifically mention 40 CFR §63.11602(a)(2) and 40 CFR §63.11602(a)(2)(iii).
- Emissions Monitoring:
  - The following requirements were referenced by the 40 CFR §63.11602(a) requirement, but are now specifically listed in each permit section:
    - The Permittee must inspect and maintain each dry particulate control device according to the following requirements [40 CFR §63.11602(a)(2)(ii) and 40 CFR §63.11602(a)(2)]:
      - The Permittee must conduct weekly visual inspections of any flexible ductwork for leaks [40 CFR §63.11602(a)(2)(ii)(A)].
      - The Permittee must conduct inspections of the rigid, stationary ductwork for leaks, and the interior of the dry particulate control unit for structural integrity and to determine the condition of the fabric filter (if applicable) every 12 months [40 CFR §63.11602(a)(2)(ii)(B)].
      - You must take corrective action when necessary [40 CFR §63.11602(a)(2)].
    - The Permittee must conduct a 5-minute visual determination of emissions from each particulate control device every 3 months using Method 22 of 40 CFR Part 60, Appendix A-7 [40 CFR §63.11602(a)(2)(iii) and 40 CFR §63.11602(a)(2)].
      - The visible emission test must be performed during the addition of dry pigments and solids containing compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling equipment [40 CFR §63.11602(a)(2)(iii)].

- If visible emissions are observed for two minutes of the required 5-minute observation period, the Permittee must conduct a Method 203C (40 CFR Part 51, Appendix M) test within 15 days of the time when visible emissions were observed. The Method 203C test will consist of three 1-minute test runs and must be performed during the addition of dry pigments and solids containing compounds of cadmium, chromium, lead, or nickel HAP to a process vessel or to the grinding and milling equipment. If the Method 203C test runs indicate an opacity greater than 10%, the Permittee must comply with the following requirements [40 CFR §63.11602(a)(2)(iii)]:
    - The Permittee must take corrective action and retest using Method 203C within 15 days. The Method 203C test will consist of three 1-minute test runs and must be performed during the addition of dry pigments and solids containing compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling equipment. The Permittee must continue to take corrective action and retest each 15 days until a Method 203C test indicates an opacity equal to or less than 10% [40 CFR §63.11602(a)(2)(iii)(A)].
    - The Permittee must resume the visible determinations of emissions in accordance with the above 3 months after the previous visible determination [40 CFR §63.11602(a)(2)(iii)(C)].
- Recordkeeping and Reporting Requirements:
    - The notification and reporting requirements in 40 CFR §63.11602(b) and the recordkeeping requirements in 40 CFR §63.11602(c) have been expanded.

- Smelters and Auxiliary Equipment:
    - Removed emission standard requiring Pemco to route no more than two smelters to a single scrubber.
    - Removed listings for SO_2, NO_X, CO, VOC, HF, and GHG from the summary page since there are no applicable emission standards for these pollutants.
    - Changed PM Anti-PSD limits from "Lesser of 0.01 gr/dscf or process weight limit" to 0.01 gr/dscf since the process weight limit is not an Anti-PSD limit. This does not affect the potential to emit (PTE) of these units.
    - Rebuilt summary page to show each emission point separately.
    - Updated summary page to show the 40 percent opacity standard in ADEM Admin. Code r. 335-3-4-.01(1). The smelters were already subject to this requirement, so no new requirements have been added.
    - The emission monitoring proviso requiring periodic visual emission checks has been changed from requiring weekly checks to requiring daily checks, and the language has been slightly modified.

- Mills:
    - Removed 10% opacity limit from EU52-DC-13. DC-13 vents indoors, and this opacity standard does not apply to units that do not vent to the atmosphere [40 CFR §63.11601(a)(5)].
    - Added the portable hoppers [EU62] to the summary page. This is an existing unit, so the facility-wide PTE will not change.
- Mixers:
    - Removed 10% opacity limit from BV-1. BV-1 vents indoors, and this opacity standard does not apply to units that do not vent to the atmosphere [40 CFR §63.11601(a)(5)].
    - Removed the following units from the summary page because they are being taken out of service or have been removed from service:
        - Mixer M1 controlled by BV-3
        - Mixer M2 and Mixer M2 Hopper controlled by EU52-DC-13
        - Mixer M3 Hopper controlled by BV-9
        - Mixer M3 controlled by BV-10
        - Mixer M5 controlled by EU47-DC-6
        - Mixer M4 controlled by EU51-DC-12 and BV-7
- Screening and Bagging:
    - Removed EDS CL1 and EDS CL2 since they are no longer on-site.
    - On May 6, 2025, Pemco informed the Department that BV-8 has been fully enclosed and no longer vents to the atmosphere. BV-8 has been removed from the summary page and permit body.
    - Screen 15 was removed, and Screen 17 was renamed to Screen 15. The new Screen 15 has been routed to EU53-DC-15. The summary page has been updated as a result.
    - Added Bulk bag unloading station to the summary page. This unit was added to the facility as authorized in the February 12, 2024 letter stating no permit is required for the bulk bag unloading station.
    - Removed 10% opacity limit from EU63-BV-1, EU52-DC-13, and EU53-DC-15. These control devices vent indoors, and this opacity standard does not apply to units that do not vent to the atmosphere [40 CFR §63.11601(a)(5)].
- Weighing Operations:
    - Reconstructed summary page to clearly identify the baghouse(s) controlling each weigh scale.
    - Updated summary page to clearly show that the 0.01 gr/dscf Anti-PSD emission standard only applies to EU101-DC-1702. The summary page now matches the emission standard shown in the body of the permit. The PTE of this process has not changed.
- Glass Color Concentrate Production Line Operation:
    - Changed PM Anti-PSD limits from "Lesser of 0.01 gr/dscf or process weight limit" to 0.01 gr/dscf since the process weight limit is not an Anti-PSD limit. This does not affect the PTE of these units.

- Removed HAPs from the summary page because this process does not have applicable emission standards for HAPs.

- Emergency Generator
  - Removed PM and SO_2 from the summary page since the Emergency Generator is not subject to emission standards for these pollutants.
  - Moved hour meter requirement from Emission Standards to Emissions Monitoring to match 40 CFR 60, Subpart JJJJ.
  - Moved maintenance recordkeeping requirements from the Emission Standards section to the Recordkeeping and Reporting Requirements section to match 40 CFR 60, Subpart JJJJ.

- Potential To Emit:
  - Due to the removal and enclosure of several units, Pemco's PTE has been recalculated. The updated PTE is shown in Table 1. The detailed calculations are shown in Appendix A.
  - The PTE for the processing equipment that is subject to an Anti-PSD limit was calculated using the Anti-PSD limit and the stack parameters in the application. The maximum gas volume was used for each calculation.
  - The PTE for processing equipment that is not subject to an Anti-PSD limit was calculated using emission factors from AP-42 Table 11.13-2, the maximum throughput and control efficiency in the application, and the capture efficiency provided by Pemco. Each unit that is completely enclosed was considered to have a 100 percent capture efficiency. An operating period of 8,760 hours per year was used for all calculations.
  - The PTE of the smelters was calculated using emission factors from the May 2024 performance tests and AP-42 factors. PM-Filterable, hydrogen fluoride (HF), nitrogen oxides (NO_X), and carbon monoxide (CO) emissions were calculated using the emission factors from the May 2024 performance tests and 8,760 hours per year. Emissions of condensable particulate matter (PM-CON), carbon dioxide (CO), and methane (CH_4) were calculated using emission factors from AP-42 Table 1.4-2 and a natural gas usage rate of 6,904 cubic feet per ton of material processed. Barium, chromium, cobalt, lead, manganese, nickel, and zinc emissions were calculated using emission factors from AP-42 Table 11.14-2 and a maximum throughput of 4.5 tons per hour. The throughput of 4.5 tons per hour is the combined maximum throughput of all three smelters. Emissions of nitrous oxide (N_2O) were calculated using an emission factor from Table C-2 to Subpart C of Part 98. Carbon dioxide equivalent (CO_2e) was calculated by multiplying the emissions of CO_2, methane, and N_2O by the global warming potentials and summing the results. A throughput of 4.5 tons per hour and 8,760 hours of operation were used for all calculations.
  - The PTE of the emergency engine was calculated using the emission standards in 40 CFR 60, Subpart JJJJ [NSPS JJJJ] and AP-42 factors. The NO_X, CO, and VOC emissions were calculated using the emission standards in NSPS JJJJ. The emissions of PM-CON, PM-Filterable, SO_2, formaldehyde, total hazardous air pollutants were calculated using the emission factors in AP-42 Table 3.2-2. Emissions of N_2O, CO_2, and methane were calculated using emission factors from Tables C-1 and C-2 of Subpart C of 40 CFR Part 98. Carbon dioxide equivalent (CO_2e) was calculated by multiplying the emissions of CO_2, methane, and N_2O by the global warming potentials and summing the results. The maximum brake horsepower in the most recent Title V renewal application and 500 hours of operation per year were used for all calculations.

Pollutant	Processing Equipment	Smelters	Emergency Engine	Total
NO_X	-	248.61	0.21	**248.82**
CO	-	1.45	0.42	**1.86**
VOC	-	-	0.10	**0.10**
PM-CON	-	0.78	3.77E-03	**0.78**
PM-Filterable	52.24	14.32	2.93E-03	**66.56**
SO_2	-	-	-	**-**
HF	-	1.58	-	**1.58**
Barium	-	5.52E-04	-	**5.52E-04**
Chromium	-	2.76E-04	-	**2.76E-04**
Cobalt	-	8.48E-05	-	**8.48E-05**
Lead	-	1.89E-04	-	**1.89E-04**
Manganese	-	2.76E-04	-	**2.76E-04**
Nickel	-	3.15E-04	-	**3.15E-04**
Zinc	-	2.37E-03	-	**2.37E-03**
CH_2O	-	-	2.01E-02	**2.01E-02**
HAP-Total	-	1.58	2.80E-02	**1.61**
CO_2	-	16,329	44.45	**16,374**
N_2O	-	3.00E-05	8.38E-05	**1.14E-04**
CH_4	-	0.31	8.38E-04	**0.31**
CO_2e	-	16,339	44.50	**16,383**

Table 1 – Facility-Wide PTE

RECOMMENDATIONS

I recommend that Pemco be issued the modified version of MSOP No.: 303-0001 for the facility in Leesburg. The facility should be able to comply with all federal and state requirements specified in its permit.

DRAFT

Jason Mote
Industrial Minerals Section
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ADEM

Date

APPENDIX A: CALCULATIONS

Control Device	Pollutant	Processing Rate	Units	EF	Units	Source	PTE	
							lb/hr	TPY
SCR1	PM	8,760	Hr/Yr	1.61	lb/hr	May 2024 Stack Test	1.61	7.05
	HF	8,760	Hr/Yr	0.13	lb/hr	May 2024 Stack Test	0.13	0.57
	NOx	8,760	Hr/Yr	24.71	lb/hr	May 2024 Stack Test	24.71	108.23
	CO	8,760	Hr/Yr	0.32	lb/hr	May 2024 Stack Test	0.32	1.40
SCR2	PM	8,760	Hr/Yr	1.66	lb/hr	May 2024 Stack Test	1.66	7.27
	HF	8,760	Hr/Yr	0.23	lb/hr	May 2024 Stack Test	0.23	1.01
	NOx	8,760	Hr/Yr	32.05	lb/hr	May 2024 Stack Test	32.05	140.38
	CO	8,760	Hr/Yr	0.01	lb/hr	May 2024 Stack Test	1.00E-02	4.38E-02

Figure 1 – Smelter Emissions Calculated with Stack Test Emission Factors

Throughput	4.5	Tons per Hour			
Natural Gas Usage	6,904	ft^3/ton			
Pollutant	**Emission Factor**	**Units**	**Source**	**lb/hr**	**TPY**
PM-CON	5.7	lb/MMscf	AP-42 Table 1.4-2	0.18	0.78
CO_2	120,000	lb/MMscf	AP-42 Table 1.4-2	3,728	16,329
CH_4	2.3	lb/MMscf	AP-42 Table 1.4-2	7.15E-02	0.31
N_2O	1.00E-04	kg/MMBtu	Table C-2 to Subpart C of Part 98	6.84E-06	3.00E-05
CO_2e	-	-	-	3,730	16,339
Barium	2.80E-05	pounds per ton	AP-42 Table 11.14-2	1.26E-04	5.52E-04
Chromium	1.40E-05	pounds per ton	AP-42 Table 11.14-2	6.30E-05	2.76E-04
Cobalt	4.30E-06	pounds per ton	AP-42 Table 11.14-2	1.94E-05	8.48E-05
Lead	9.60E-06	pounds per ton	AP-42 Table 11.14-2	4.32E-05	1.89E-04
Manganese	1.40E-05	pounds per ton	AP-42 Table 11.14-2	6.30E-05	2.76E-04
Nickel	1.60E-05	pounds per ton	AP-42 Table 11.14-2	7.20E-05	3.15E-04
Zinc	1.20E-04	pounds per ton	AP-42 Table 11.14-2	5.40E-04	2.37E-03
Total				9.27E-04	4.06E-03
The throuhgput value in this table is the combined values for all three smelters.					

Figure 2 – Smelter Emissions Calculated with AP-42 Emission Factors

Control Device	Process Unit	Processing Rate	Units	EF	Units	Uncontrolled Emissions	Units	Capture Efficiency	Units	Building Control Efficiency	Units	Fugitive Emissions	Units	Control Efficiency	Units	Controlled Emissions	Units
DC-7 [EU48]	S-2 Conveyor and Bagger [EU4A]	2,500	lb/hr	3.00	lb/ton material processed	16.43	TPY	95	Percent	50	Percent	0.41	TPY	97.5	Percent	0.39	TPY
DC-16 [EU54]	S-3 Conveyor and Bagger [EU5]	2,500	lb/hr	3.00	lb/ton material processed	16.43	TPY	95	Percent	50	Percent	0.41	TPY	97.5	Percent	0.39	TPY
DC-23 [EU58]	S-4 Conveyor and Bagger [EU6]	2,500	lb/hr	3.00	lb/ton material processed	16.43	TPY	95	Percent	50	Percent	0.41	TPY	97.5	Percent	0.39	TPY
DC-6 [EU47]	G6 Mill [EU13]	625	lb/hr	3.00	lb/ton material processed	4.11	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.16	TPY
	G7 Mill [EU14]	625	lb/hr	3.00	lb/ton material processed	4.11	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.16	TPY
	G8 Mill (PT) [EU15-A]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.33	TPY
	G9 Mill [EU16-A]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.33	TPY
	G12 Mill [EU17]	2,500	lb/hr	3.00	lb/ton material processed	16.43	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.66	TPY
	G8 Mill Hopper (PT) [EU15-B]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.33	TPY
	G9 Mill Hopper [EU16-B]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.33	TPY
	G12 Mill Hopper [EU17]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.33	TPY
	Screen S6 [EU29-B]	417	lb/hr	3.00	lb/ton material processed	2.74	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.11	TPY
	Screen S7 [EU30]	417	lb/hr	3.00	lb/ton material processed	2.74	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.11	TPY
	Screen S8 [EU31]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
	Screen S9 [EU32]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.22	TPY
	Screen S12 [EU33]	1,667	lb/hr	3.00	lb/ton material processed	10.95	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	0.44	TPY
	Portable Hoppers [EU62]	11,200	lb/hr	3.00	lb/ton material processed	73.58	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	2.94	TPY
PT means the pneumatic transporter conveys material to this unit.																	

Figure 3 – Processing Equipment PTE Calculated with AP-42 Factors (Table 1 of 4)

Control Device	Process Unit	Processing Rate	Units	EF	Units	Uncontrolled Emissions	Units	Capture Efficiency	Units	Building Control Efficiency	Units	Fugitive Emissions	Units	Control Efficiency	Units	Controlled Emissions	Units
BV-2 [EU64]	Mixer M1 Hopper [EU20-A]	1,125	lb/hr	3.00	lb/ton material processed	7.39	TPY	95	Percent	50	Percent	0.18	TPY	96	Percent	0.28	TPY
BV-1 [EU63]	EDS CL1 Hopper [EU37-A]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	95	Percent	50	Percent	0.21	TPY	96	Percent	0.31	TPY
DC-13 (Vents Indoors) [EU52]	G1 Mill [EU9]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	95	Percent	50	Percent	0.21	TPY	96	Percent	0.31	TPY
	G2 Mill [EU10]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	95	Percent	50	Percent	0.21	TPY	96	Percent	0.31	TPY
	Screen S1 [EU25]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
	Screen S2 [EU26-B]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
BV-5 (Vents Indoors) [EU67]	Screen S2 Hopper [EU26-A]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
BV-6 (Vents Indoors) [EU68]	Screen S3 Hopper [EU27-A]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY

Figure 4 – Processing Equipment PTE Calculated with AP-42 Factors (Table 2 of 4)

Control Device	Process Unit	Processing Rate	Units	EF	Units	Uncontrolled Emissions	Units	Capture Efficiency	Units	Building Control Efficiency	Units	Fugitive Emissions	Units	Control Efficiency	Units	Controlled Emissions	Units
DC-15 (Vents Indoors) [EU53]	G3 Mill [EU11]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	95	Percent	50	Percent	0.21	TPY	96	Percent	0.31	TPY
	G14 Mill [EU18]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	95	Percent	50	Percent	0.21	TPY	96	Percent	0.31	TPY
	G15 Mill [EU19]	1,250	lb/hr	3.00	lb/ton material processed	8.21	TPY	95	Percent	50	Percent	0.21	TPY	96	Percent	0.31	TPY
	Screen S14 [EU34]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
	Screen S3 [EU27-B]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
	Screen S16 [EU36]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
DC-21 [EU57]	Mixer M6 [EU63]	2,500	lb/hr	0.60	lb/ton material processed	3.29	TPY	95	Percent	50	Percent	0.08	TPY	96	Percent	0.12	TPY
	Screen S15 [EU35]	833	lb/hr	3.00	lb/ton material processed	5.47	TPY	95	Percent	50	Percent	0.14	TPY	96	Percent	0.21	TPY
DC-12 [EU51]	G4 Mill [EU12]	2,500	lb/hr	3.00	lb/ton material processed	16.43	TPY	95	Percent	50	Percent	0.41	TPY	97	Percent	0.47	TPY
	Screen S4 [EU28]	1,667	lb/hr	3.00	lb/ton material processed	10.95	TPY	95	Percent	50	Percent	0.27	TPY	97	Percent	0.31	TPY

Figure 5 – Processing Equipment PTE Calculated with AP-42 Factors (Table 3 of 4)

Control Device	Process Unit	Processing Rate	Units	EF	Units	Uncontrolled Emissions	Units	Capture Efficiency	Units	Building Control Efficiency	Units	Fugitive Emissions	Units	Control Efficiency	Units	Controlled Emissions	Units
DC-28 [EU60]	Bulk Bag Operation [EU43]	2,500	lb/hr	3.00	lb/ton material processed	16.43	TPY	95	Percent	50	Percent	0.41	TPY	96	Percent	0.62	TPY
	Kitting Station [EU44]	8,750	lb/hr	3.00	lb/ton material processed	57.49	TPY	95	Percent	50	Percent	1.44	TPY	96	Percent	2.18	TPY
DC-34 [EU-110]	Bulk Bag Unloading [EU-102]	11,200	lb/hr	3.00	lb/ton material processed	73.58	TPY	100	Percent	50	Percent	0.00	TPY	96	Percent	2.94	TPY
DC-8 [EU49]	Spec Weighing [EU45]	2,500	lb/hr	3.00	lb/ton material processed	16.43	TPY	95	Percent	50	Percent	0.41	TPY	96	Percent	0.62	TPY
DC-10 [EU-50]	Weigh Station Single Scale [EU46]	10,000	lb/hr	3.00	lb/ton material processed	65.70	TPY	95	Percent	50	Percent	1.64	TPY	96	Percent	2.50	TPY
	Weigh Station Scales 1-2 with Side Feeder [EU-39A]	20,000	lb/hr	3.00	lb/ton material processed	131.40	TPY	95	Percent	50	Percent	3.29	TPY	96	Percent	4.99	TPY
	Weigh Station Scales 1-2 with Side Feeder [EU-39A]	20,000	lb/hr	3.00	lb/ton material processed	131.40	TPY	95	Percent	50	Percent	3.29	TPY	96	Percent	4.99	TPY
	Weigh Station Scales 3-4 with Side Feeder [EU-39B]	20,000	lb/hr	3.00	lb/ton material processed	131.40	TPY	95	Percent	50	Percent	3.29	TPY	96	Percent	4.99	TPY
	Weigh Station Scales 5-6 with Side Feeder [EU-39C]	20,000	lb/hr	3.00	lb/ton material processed	131.40	TPY	95	Percent	50	Percent	3.29	TPY	96	Percent	4.99	TPY

Figure 6 – Processing Equipment PTE Calculated with AP-42 Factors (Table 4 of 4)

Process Unit	Limit (gr/dscf)	Standard Temperature (F)	Standard Temperature (R)	Volume of Gas Discharged (ACFM)	Temperature of Gas Discharged (F)	Temperature of Gas Discharged (R)	PTE (lb/hr)	PTE (TPY)
S-2 Mixer and Feeder [EU4B] controlled by DC-7 [EU48]	0.01	76.73	568.40	6,500	68.00	559.67	0.57	2.48
S-3 Mixer and Feeder [EU7] controlled by DC-18 [EU56]	0.01	76.73	568.40	6,500	68.00	559.67	0.57	2.48
S-4 Mixer and Feeder [EU8] controlled by DC-23 [EU58]	0.01	76.73	568.40	6,500	68.00	559.67	0.57	2.48
Weigh Station Scales 3-4 with Side Feeder [EU-39B]	0.01	76.73	568.40	3,000	80.00	571.67	0.26	1.12
Glass Color Concentrate Production Line DC-1 [EU69]	0.01	76.73	568.40	3,000	68.00	559.67	0.26	1.14
Glass Color Concentrate Production Line DC-2 [EU70]	0.01	76.73	568.40	3,000	68.00	559.67	0.26	1.14
Total							2.48	10.84

Figure 7 – Processing Equipment PTE Calculated with Anti-PSD Limits

DATA:			
		Engine	
ENGINE TYPE	=	4SLB	NG
FUEL HEAT CONTENT	=	1,060	Btu/Scf
FUEL H2S CONTENT	=	0.00	ppmv
MAXIMUM ENGINE HP	=	190	HP
ENGINE OP HOURS	=	500	Hr
ENGINE RATING	=	1.52	MMBtu/hr
BRAKE-SPECIFIC FUEL CONSUMPTION	=	8,000	Btu/ HP-hr
CALCULATION BASIS	=	Controlled and Uncontrolled	
EMISSION FACTORS (EF)		MANUFACTURER'S EF	
		Uncontrolled	Controlled
NO_X	=	2 g/HP-hr	g/HP-hr
CO	=	4 g/HP-hr	g/HP-hr
VOC	=	1 g/HP-hr	g/HP-hr
CH_2O	=	g/HP-hr	g/HP-hr
CH_4	=	g/HP-hr	g/HP-hr

AP-42 Emission Factors (lb/MMBtu)

Type	PM	SO_2[1]	NO_X	CO	VOC	CH_2O	Other HAPs	
Diesel	3.10E-1	[By Mass]	4.41E+0	9.50E-1	3.50E-1	1.18E-3	2.69E-3	(Tables 3
2SLB	3.84E-2	5.88E-4	3.17E+0	3.86E-1	1.20E-1	5.52E-2	2.53E-2	(Table 3.
4SLB	7.71E-5	5.88E-4	4.08E+0	3.17E-1	1.18E-1	5.28E-2	2.10E-2	(Table 3.
4SRB	9.50E-3	5.88E-4	2.27E+0	3.72E+0	2.96E-2	2.05E-2	1.20E-2	(Table 3.

40 CFR Part 98 Subpart C Greenhouse Gas Emission Factors
Tables C-1 & C-2
(kg/MMBtu)

	N_2O	CO_2	CH_4
Diesel	0.0006	75.04	0.003
NG	0.0001	53.06	0.001
LPG	0.0006	62.72	0.003
Propane	0.0006	61.46	0.003

GWP	
N_2O=	298
CO_2=	1
CH_4=	25

Controlled and Uncontrolled 190 HP Engine Emissions Calculations

									Uncontrolled	Uncontrolled
PM-CON	0.0099 Lb / MMBtu	1.52 MMBtu / Hr	500 Hrs / Year	1 Ton / 2000 Lb	S.F.			=	0.001 Pounds / Hour	0.004 Tons / Year
PM-Filterable	0.0077 Lb / MMBtu	1.52 MMBtu / Hr	500 Hrs / Year	1 Ton / 2000 Lb	S.F.			=	0.001 Pounds / Hour	0.003 Tons / Year
SO_2	0.0006 lb / MMBtu	1.52 MMBtu / Hr	500 Hrs / Year	1 Ton / 2000 Lb	S.F.	0 ppmv S / 3.44 ppmv S		=	0.000 Pounds / Hour	0.000 Tons / Year
NO_X	2 g / HP-Hr	190.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb	S.F.		=	0.048 Pounds / Hour	0.209 Tons / Year
CO	4 g / HP-Hr	190.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb	S.F.		=	0.096 Pounds / Hour	0.419 Tons / Year
VOC	1.00 g / HP-Hr	190.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb	S.F.		=	0.024 Pounds / Hour	0.105 Tons / Year
CH_2O	0.0528 lb / MMBtu	1.52 MMBtu / hr		500 Hr / Year	1 Ton / 2000 Lb	S.F.		=	0.005 Pounds / Hour	0.020 Tons / Year
non-CH_2O HAPs	0.0210 lb / MMBtu	1.52 MMBtu / Hr		500 Hr / Year	1 Ton / 2000 Lb	S.F.		=	0.002 Pounds / Hour	0.008 Tons / Year
CO_2	1.52 MMBtu / Hr	53.06 kg / MMBtu	0.001 Metric Ton / kg	500 Hr / Year	1.10231 Tons / 1 M Ton			=	10.149 Pounds / Hour	44.451 Tons / Year
N_2O	1.52 MMBtu / Hr	0.0001 kg / MMBtu	0.001 Metric Ton / kg	500 Hr / Year	1.10231 Tons / 1 M Ton			=	1.9E-05 Pounds / Hour	8.4E-05 Tons / Year
CH_4	1.52 MMBtu / Hr	0.001 kg / MMBtu	0.001 Metric Ton / kg	500 Hr / Year	1.10231 Tons / 1 M Ton			=	0.000 Pounds / Hour	0.001 Tons / Year
Mass Sum	4.45E+01 Tons / Year / CO_2	+	0.0001 Tons / Year / N_2O	+	0.0008 Tons / Year / CH_4			=	10.149 Pounds / Hour	44.452 Tons / Year
CO_2e	44.45 TPY*1 / 44.45 / CO_2	+	0.0001 TPY*298 / 0.02 / N_2O	+	0.001 TPY*25 / 0.02 / CH_4			=	10.159 Pounds / Hour	44.497 Tons / Year

[1] EPA AP-42 factors assume gas to have 2000 gr S/MMScf (at EPA STP). This equates to 3.44 ppmv S, assuming ideal gas. AP-42 factor can be corrected to sulfur value of facility gas by comparing actual sulfur values to EPA reference point. Assume ppmv H_2S = ppmv S (true if H_2S = TRS and TRS is entirely monosulfur compounds).

Figure 8 – Emergency Engine PTE