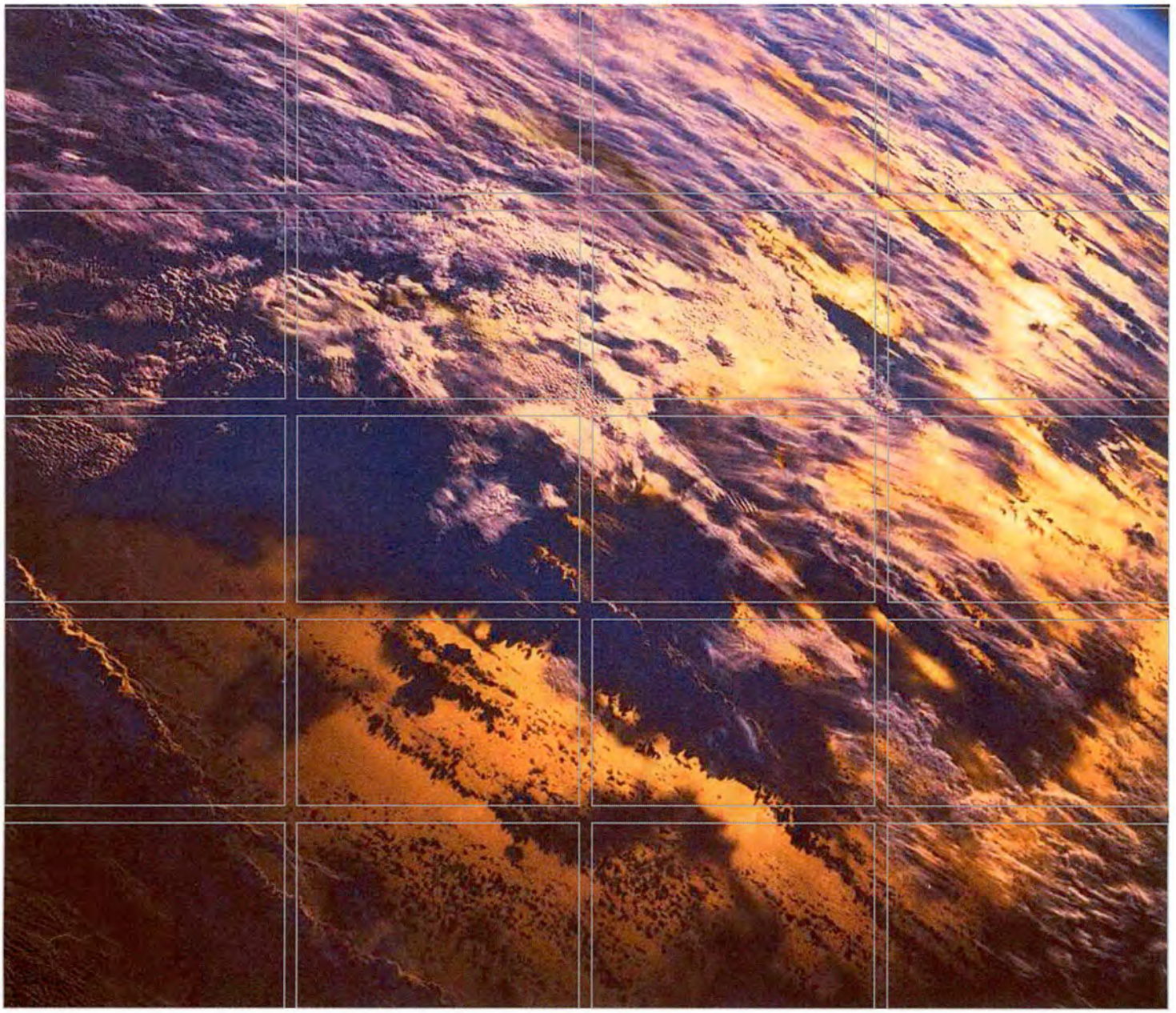


Application to Renew Class I Permit

Permit Number 2026

Asarco Mission Complex, Asarco LLC

October 2017

ERM-WEST, INC.
555 17th Street, Suite 1700
Denver, Colorado 80202
(303) 741-5050
www.erm.com

ASARCO
GRUPO MEXICO

October 16, 2017

HAND DELIVERED (PDEQ) & CERTIFIED MAIL/ELECTRONIC DELIVERY (EPA)
RETURN RECEIPT REQUESTED

Mr. Scott Porter
Environmental Quality Manager
Pima County Department of Environmental Quality - Air Program
33 N. Stone Avenue, Suite 700
Tucson, AZ 85701

RECEIVED BY
PIMA COUNTY
OCT 16 2017
DEPARTMENT OF
ENVIRONMENTAL QUALITY

Mr. Eugene Chen
US EPA, Region 9
Administrative Officer/Budget Analyst (detail)
75 Hawthorne Street
San Francisco, CA 94105

Re: Application to Renew Class I Permit No. 2026
Asarco Mission Complex, Asarco LLC

Dear Mr. Porter and Mr. Chen:

Please find enclosed an application to renew Class I Permit No. 2026 (Class I Permit). The Class I Permit was issued by the Pima County Division of Environmental Quality (PDEQ) to Asarco LLC (Asarco) on April 19, 2013, and expires on April 18, 2018. Asarco is submitting the enclosed renewal application to PDEQ at least six months prior to the date of expiration of the Class I Permit and prior to the application submittal deadline of October 18, 2018. At this time, we are requesting the permit shield for our facility.

The information included in the application is in accordance with the requirements of PDEQ regulations at 17.12.160, and includes the "Standard Permit Application Form" and all the applicable information required by the "Filing Instructions" as shown in Title 18, Chapter 2, Appendix 1 of the A.A.C.

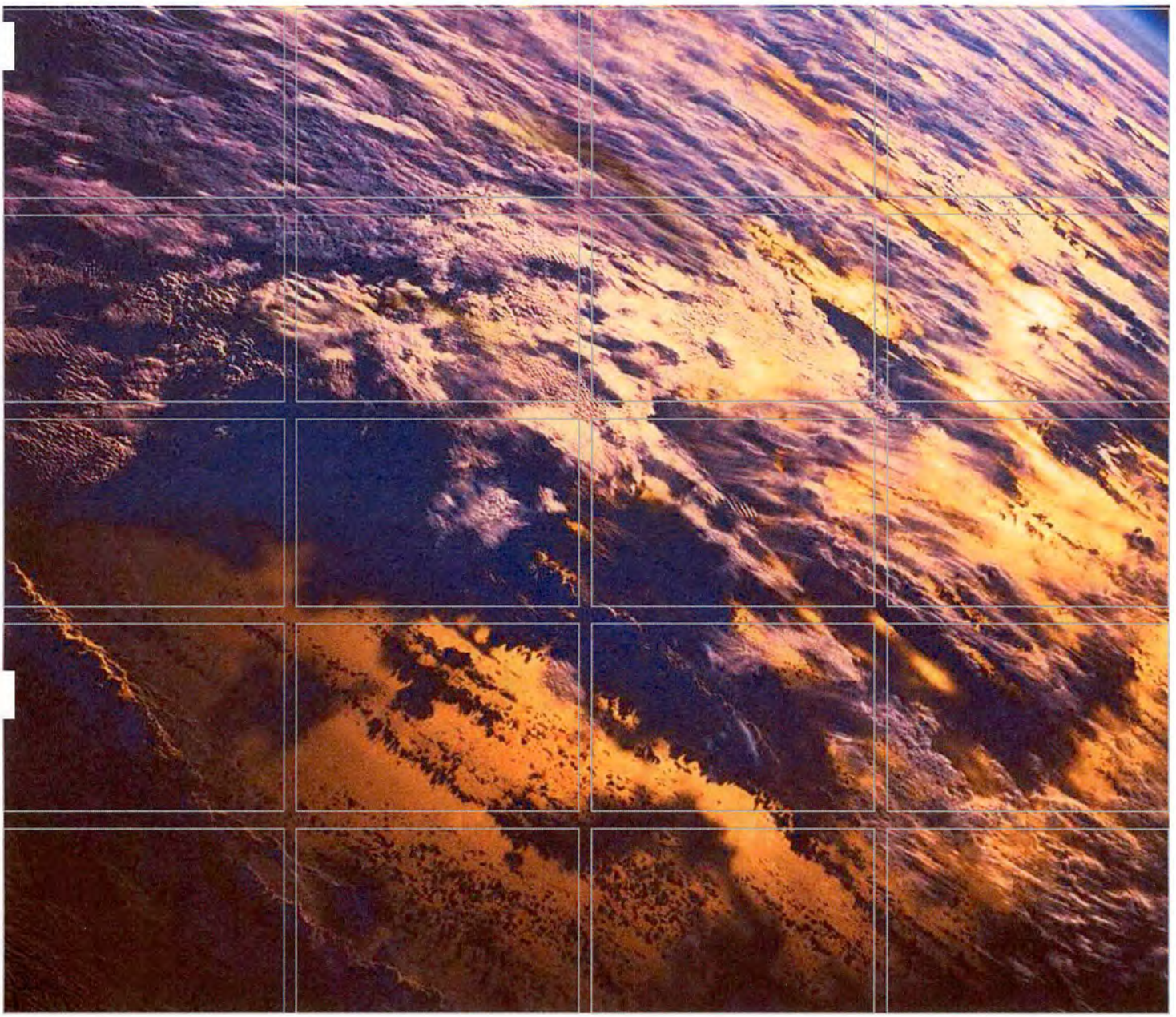
If you have any questions or need additional information, please contact Jamie Ekholm at (520) 393-4671.

"I hereby certify that based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

Regards,

Tom Phillips
General Manager

Enclosure: Application to Renew Class I Permit No. 2026



Application to Renew Class I Permit

Permit Number 2026

Asarco Mission Complex, Asarco LLC

October 2017

ERM-WEST, INC.
555 17th Street, Suite 1700
Denver, Colorado 80202
(303) 741-5050
www.erm.com

TABLE OF CONTENT

1 INTRODUCTION 1

2 FACILITY OVERVIEW 3

3 PROCESS DESCRIPTION 4

3.1 Mining Activities 5
3.2 Primary Crushing and Grinding Circuit 5
3.2.1 Mission Circuit 5
3.2.2 South Mill Circuit 6

3.3 By-Products Plant 7
3.4 Generators 8
3.5 Fuel Storage 8
3.6 Mine Tailings 9

4 FACILITY-WIDE POTENTIAL TO EMIT 10

5 PROPOSED CHANGES TO OPERATING PERMIT 11

5.1 Section 1 - Mission Primary Crusher and Stockpile 11
5.2 Section 2A - Emission Group A 15
5.3 Section 2A - Emission Group B 16
5.4 Section 2A - Emission Group B 16
5.5 Section 2A - Emission Group B 17
5.6 Section 3 - Emission Group A 17
5.7 Section 3 - Emission Group C 18
5.8 Section 4 - Mission North Primary Crusher and Stockpile 19
5.9 Section 5 - Mission North Combustion Off Gases 19
5.10 Section 6A and Section 6B 19
5.11 Section 6B - Emission Group B - SSOPS-2 20
5.12 Section 6B - Emission Group B - SSOPS-1 20
5.13 Section 6B - Emission Group B 21
5.14 Section 7A 21
5.15 Section 7B - Emission Group B - SSOPS-3 21
5.16 Section 7B - Emission Group B - SSOPS4/SSOPS-4A 22
5.17 Section 7B - Emission Group B - SSOPS4/SSOPS-4 22
5.18 Section 7B - Emission Group A 22
5.19 Section 7B - Reporting Requirements 22
5.20 Section 7B - Reporting Requirements 23
5.21 Section 7B - Notification 23
5.22 Section 10 - Compliance Assurance Monitoring 23
5.23 Section 10 - Compliance Assurance Monitoring 24

6 AIR QUALITY REGULATORY REQUIREMENTS 25

6.1 PDEQ Requirements 25
6.2 New Source Performance Standard 28
6.2.1 40 CFR Subpart 60 Subpart LL - NSPS for Metallic Mineral Processing Plants 28
6.2.2 40 CFR 60 Subpart IIII - NSPS for Stationary Compression Ignition Internal Combustion Engines 33
6.2.3 40 CFR 60 Subpart JJJJ - NSPS for Stationary Spark Ignition Internal Combustion Engines 33

6.3 National Emission Standards for Hazardous Air Pollutants (NESHAP) 34
6.3.1 40 CFR 63 Subpart ZZZZ - NESHAP for Stationary Reciprocating Internal Combustion Engines 34
6.3.2 40 CFR 63 Subpart CCCCCC - NESHAP for Source Category: Gasoline Dispensing Facilities 35

6.4 Compliance Assurance Monitoring (40 CFR Part 64) 35
6.5 Non-applicable Requirements 38

7 EXEMPTIONS AND INSIGNIFICANT ACTIVITIES 41

7.1 Landscaping, Building Maintenance, or Janitorial Activities 41
7.2 Gasoline Storage Tanks 42
7.3 Diesel and Fuel Oil Storage Tanks 42
7.4 Batch Mixers 42
7.5 Hand-held or Manually Operated Equipment 42
7.6 Internal Combustion (IC) Engine-driven Compressors, Generators, Pumps 42
7.7 Lab Equipment 43
7.8 Size Based Exemptions 43
7.9 Storage and Distribution 44
7.10 Used Oil Collection and Recycling 46
7.11 Burning Activities 46
7.12 Roadways 47
7.13 Proposed Insignificant Activities 47
7.13.1 Touch N Seal Usage 47
7.13.2 Maintenance Shop Truck Painting 47

8 SOURCE COMPLIANCE STATUS 49

List of Tables

Table 1. Regulated Air Pollutant Sources. 3
Table 2. Fuel Storage Tank List. 8
Table 3. Potential to Emit Summary - Criteria Air Pollutants and HAPs. 10
Table 4. Potential to Emit Summary - Greenhouse Gas. 10
Table 5. Applicable PDEQ Requirements. 25
Table 6. Affected Emission Points - Process Fugitives - NSPS Subpart LL. 29
Table 7. NSPS Subpart LL - Applicable Requirements - Process Fugitive Emissions. 29
Table 8. Affected Emission Points - Point Sources - Wet Scrubbers - NSPS Subpart LL. 30
Table 9. NSPS Subpart LL - Applicable Requirements - Point Sources - Wet Scrubbers. 30
Table 10. Affected Emission Points - Point Sources - Dry Dust Collectors - NSPS Subpart LL. 32
Table 11. NSPS Subpart LL - Applicable Requirements - Process Fugitive Emissions. 32
Table 12. NSPS Subpart III - Applicable Emission Limits. 33
Table 13. NSPS Subpart JJJJ - Applicable Emission Limits. 34
Table 14. NESHAP Subpart ZZZZ - Applicable Emission Limits. 34
Table 15. NESHAP Subpart CCCCCC - Applicable Requirements. 35
Table 16. Emission Units Subject to Compliance Assurance Monitoring. 36
Table 17. Non-Applicable PDEQ Requirements. 38
Table 18. Insignificant Combustion Equipment. 44
Table 19. Chemical Storage and Process Holding Tanks 44

List of Figures

Figure 1 - Asarco Mission Complex - Site Location Map
Figure 2 - Asarco Mission Complex - Site Location Map
Figure 3 - Asarco Property
Figure 4 - Asarco Mission Complex - Overview Process Flow
Figure 5 - Asarco Mission Complex - Mining
Figure 6 - Mission Circuit
Figure 7 - Mission Concentrator
Figure 8 - Mission Concentrator - Section 1 and 2
Figure 9 - Mission Concentrator - Section 3
Figure 10 - Moly By-products Circuit
Figure 11 - Moly By-products Circuit
Figure 12 - Mission Concentrate Dewatering
Figure 13 - South Circuit
Figure 14 - South Grinding Circuit
Figure 15 - South Floatation Circuit
Figure 16 - South Concentrate Dewatering
Figure 17 - South Concentrate Dewatering

List of Appendices

Appendix A - Permit Application Completeness Checklist for Class I Source
Appendix B - Standard Permit Application Form for Class I Sources
Appendix C - Facility Plot Plan
Appendix D - Emission Point Information
Appendix E - Equipment List and Process Rates
Appendix F - Detailed Potential to Emit (PTE) Calculations

1 Introduction

ASARCO LLC (Asarco) owns and operates the Mission Complex at 4201 W. Pima Mine Road, Sahuarita, Arizona, Pima County. The Mission Complex operates pursuant to Air Quality Operating Permit No. 2026 (Operating Permit) issued by the Pima County Department of Environmental Air Quality (PDEQ) on April 19, 2013, and expires April 18, 2018. The Operating Permit was most recently revised July 18, 2017.

Asarco is submitting this application to renew the Operating Permit. The application is being submitted to PDEQ at least six months prior to the date of expiration of the Operating Permit. The information included in the application is in accordance with the requirements of PDEQ regulations at 17.12.160, and includes the "Standard Permit Application Form" and all the applicable information required by the "Filing Instructions" as shown in Title 18, Chapter 2, Appendix 1 of the A.A.C. A summary, where specific information is included in the permit application, is provided below.

1. *Section 1 - Introduction* - This section summarizes the reason for submitting this renewal application, and includes a summary of the information provided in each section of the application. The section is intended to provide an overview of the application content and thereby provide PDEQ the ability to navigate the application and locate specific information.

2. *Section 2 - Facility Overview* - This section provides information on where the Asarco Mission Complex is located, and its relative location to major roads and cities. It also includes a general description for how US EPA and PDEQ has characterized the ambient air in which the Asarco Mission Complex is located, as it pertains to the National Ambient Air Quality Standards (NAAQS) and the ambient air standard identified in PDEQ regulation at 17.08 (Article I) for criteria air pollutants.

3. *Section 3 - Process Description* - This section describes the various processes currently implemented at the Asarco Mission Complex. Primary processes are associated with the extraction and beneficiation of copper ore and the production of copper concentrate for market. There are also other subordinate processes that support the primary processes. The process description includes a narrative of the process and references to specific emission points, where applicable.

4. *Section 4 - Facility Air Emissions* - This section provides a summary of the potential to emit (PTE) for the Mission Complex, including criteria air pollutants, hazardous air pollutants, and greenhouse gas emissions. Detailed emissions calculations to support this emissions summary are included as Appendix D to this renewal application.

5. *Section 5 - Proposed Changes to Operating Permit* - Asarco is requesting several changes to the Operating Permit in order to correct permit language or support certain operational changes that need to be reflected accurately. This section includes the requested permit change, the location of the change within the Operating Permit, and the basis for the request. The proposed changes are not intended to permit new equipment, modify existing equipment, or revise any applicable requirement.

6. *Section 6 - Air Quality Regulatory Requirements* - This section provides a review of the specific PDEQ and EPA air quality requirements that are applicable to specific emission units or emission points in the Mission Complex. The review is intended to identify the applicable emission limit or standard, provide any applicable monitoring requirements, and indicate how the facility currently complies or proposes to comply with the applicable requirements. This section also includes a list of the requirements that are not applicable, along with the regulatory citation and the basis for the non-applicability.

7. *Section 7 - Exemptions and Insignificant Activities* - A list of the exemptions for certain regulatory requirements applicable to existing emission units are included in this section. It also includes a list of emission units that qualify as insignificant emission units under PDEQ regulations. Also included are references to the regulatory requirement, the emission unit, and the basis on which the regulatory exemption or insignificant status is being requested.

8. *Section 8 - Source Compliance Status* - A discussion of the compliance status of the Mission Complex with respect to all applicable requirements, along with how the compliance basis has been demonstrated to PDEQ, is provided in this section.

9. *Appendices*: Appendices included in this application are:

    - Appendix A - Permit Application Completeness Checklist for Class I Source
    - Appendix B - Standard Permit Application Form for Class I Sources
    - Appendix C - Facility Plot Plan
    - Appendix D - Emission Point Information
    - Appendix E - Equipment List and Process Rates
    - Appendix F - Detailed PTE Calculations

2 Facility Overview

The Mission Complex is located at 4201 W. Pima Mine Road, Sahuarita, Arizona, in Pima County. The Mission Complex is located due south of the city of Tucson on Interstate 19, off West Pima Mine Road. Figure 1 provides the general relative location of the Asarco Mission Complex with the city of Tucson, Sahuarita, Interstate 19, and West Pima Mine Road. An overview of the entire Mission Complex is included as Figure 2.

A portion of the Mission Complex is located on land owned by the Tohono O'odham Nation and is referred to as Asarco Mission Complex – San Xavier. The San Xavier facility operates under its own Title V Permit TO-ROP 15-01, issued by US EPA on August 10, 2017. Figure 3 provides an overview of the Asarco Mission Complex and identifies the area leased by Asarco from the Tohono O'odham Nation.

The Mission Complex is a source of regulated air pollutants nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 micron in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 micron in aerodynamic diameter ($PM_{2.5}$), carbon monoxide (CO), and volatile organic compounds (VOC). The facility is also a source of hazardous air pollutants (HAPs) primarily emitted from metallic HAPs contained within the ore and to lesser extent HAP emissions from diesel and gasoline fuel storage and loading operations. The facility emits GHG emissions generated from the combustion of onsite diesel and natural gas combustion equipment. A summary of the air pollutants emitted by the Mission Complex and the primary source of the air pollutants are provided in Table 1.

Table 1. Regulated Air Pollutant Sources.

Regulated Air Pollutant	Primary Emissions Sources
NO_2	Diesel/natural gas engines, small (<5 MMBtu/hr) natural gas fired dyers, rock blasting
SO_2	Diesel/natural gas engines, small (<5 MMBtu/hr) natural gas fired dyers
$PM/PM_{10}/PM_{2.5}$	Crushing/transfer operations associated with ore beneficiation, blasting, heavy equipment usage
CO	Diesel/natural gas engines, small (<5 MMBtu/hr) natural gas fired dyers, rock blasting
VOC	Diesel/natural gas engines, small (<5 MMBtu/hr) natural gas fired dyers, diesel/gasoline storage and dispensing
HAPs	Metallic HAP in PM generated from crushing/transfer operations, organic HAPs contained within diesel/gasoline fuel, HAPs from diesel/natural gas combustion
GHG	Diesel engines, small (<5 MMBtu/hr) natural gas fired dyers

The Mission Complex is currently a major source for purposes of particulate matter emissions ($PM/PM_{10}/PM_{2.5}$) and an area source for HAPs. The facility is located in an area that is classified as attainment or maintenance with respect to all US EPA NAAQS and ambient air quality standards included in PDEQ regulation 17.08.010 (Article I), for all monitored criteria pollutants.

3 Process Description

The Mission Complex is an open pit copper mine that extracts copper ores for the production of copper concentrate. The copper concentrate is shipped offsite for processing into metallic copper for use in commerce. The mine operates equipment and processes for drilling and blasting of the ore body, collection, and transfer of the blasted ore to crushing equipment, ore grinding, crushed ore screening, and beneficiation of the crushed ore to concentrate using the conventional froth flotation method. The final product is a copper concentrate that is shipped off-site for further beneficiation of the copper concentrate to metallic copper. The facility currently operates 24 hours per day, 365 days per year except during preventative maintenance, shutdown, or repair of equipment.

The Mission Mine Complex operates three crushing and three grinding circuits as follows:

1) *Mining Activities* - Asarco operates an open pit mine for the extraction of copper ore. Equipment and processes used to extract copper include drilling, blasting, shovels, haul trucks, and other miscellaneous equipment. The mining of the ore is intended to transfer the ore to the Mission Circuit, Mission North Circuit, and South Circuit for further processing.

2) *Mission Circuit/North Circuit* - The circuit consists of the Mission Primary/Secondary Crushers, Mission North Primary/Secondary/Tertiary Crushers, Coarse Ore Stockpile, and the Mission Concentrator.[1]

3) *South Circuit* - The circuit consists of the Mission South Primary Crusher, Coarse Ore Stockpile, and Concentrator.

4) *By-product Plant* - The by-product circuit includes material handling screw dryers. The circuit conducts no crushing and grinding operations. (Please note that operations at the Moly By-product Circuit have been temporarily suspended by Asarco.)

5) *Emergency Generators* - The facility has installed and operates generators to support specific operations at the mine when power from the main line is not available.

6) *Fuel Storage and Dispensing* - The Mission Complex operates several tanks and associated equipment for the dispensing of gasoline and diesel fuel for onsite equipment.

7) *Mine Tailings* - Tailings slurry from the extraction and beneficiation process is piped to the tailing facility.

Detailed process flow drawings for the operations at Asarco Mission Complex is included as Figures 4 through 17, while facility plot plans are included as Appendix C.

[1] Asarco is requesting to remove the Mission North Crusher as listed in Section 4 of the Operating Permit. Please refer to Section 5.8 of this permit renewal application for information.

3.1 Mining Activities

The Asarco Mission Complex is an open pit copper mine. Copper ore is extracted from the pit by drilling blast holes using rotary air drills. The rock is blasted using ANFO (Ammonium Nitrate and Fuel Oil). The blasted rock is loaded onto the mine haul trucks using electric shovels. Copper ore and overburden are transported to various locations using the haul trucks. The overburden is hauled to overburden deposition areas located onsite. Ore grade material is hauled to the Mission Primary Crusher and the South Primary Crusher for further crushing. Miscellaneous support equipment (i.e., rubber tire dozers, track dozers, blades, service equipment, etc.) are also used to support mining activities.

The mining activities are primarily a source of fugitive PM, PM_{10}, and $PM_{2.5}$ emissions. Where possible, particulate emissions are controlled using dust shields and wetting down of surfaces to mitigate the formation of fugitive dust. The blasting operations are also a source of fugitive NOx and CO emissions from the blasting of drilled holes. The PTE for emissions from the activities are provided under the Mining section in the PTE calculations included as Appendix F.

3.2 Primary Crushing and Grinding Circuit

3.2.1 Mission Circuit

(1). Primary Crushing

Ore from the mine is transferred using haul trucks to the 54" mission primary crusher (M303-E3). The crushed ore from the primary crusher is transferred through two apron feeders (M303-E4 and M303-E5), to the stockpile feed conveyer (M303-E9) to the mission coarse ore stockpile (WFOPM-1) for temporary storage. Emission from the primary crusher and transfer to the stockpile feed conveyer are controlled by wet scrubber SSOPM-1.

(2). Secondary Crushing

The coarse ore from the stockpile is transferred through six vibratory feeders located under the stockpile to two belt conveyers that transfer the crushed ore to the mission secondary crusher building into the secondary crushers (M307-E3 and M307-E4) through double deck screens (M307-E1, M307-E2, M307-E5, M307-E6, M307-E14, M307-E15, M307-E55). Emissions from transfer from the coarse ore stockpile are controlled by hydrostatic precipitator SSOPS-2.

Oversize ore from the secondary crushers is transferred through screens to the tertiary crushers (307-E12, 307-E13, M307-E54) for further crushing. Emissions from the transfer operations are controlled using wet scrubber SSOPM-3. Overall, the secondary crusher building utilizes seven large vibrating screens and five crushers (two secondary and three tertiary) to accomplish the size reduction needed. Emissions from the secondary and tertiary crushing and transfer operations are controlled by wet scrubbers SSOPM-4, SSOPM-5, SSOPM-6, and SSOPM-7.

(3). Mission Concentrator

Undersize ore is transported by conveyors to a fine ore bin from which it is retrieved by a system of feeders and conveyor belts and fed into the grinding circuits. Emissions from this operation are controlled by SSOPM-8, SSOPM-9, SSOPM-10, SSOPM-11, SSOPM-12, and SSOPM-13. SSOPM- 9 through 13 are vented to inside the concentrator building.

Each grinding circuit consists of one rod mill containing 4" steel rods, and two ball mills containing 2" steel balls. The rotating mills grind the ore to liberate the mineral from the waste rock by reducing the sizing from 5/8" to a range of 15% +65 mesh and 54% -200 mesh. A combination of six circuits, consisting of six rod mills and twelve ball mills, make up the grinding sections. Emissions from the grinding circuit are controlled by wet scrubbers SSOPM-14, SSOPM-15, SSOPM-16, SSOPM-17, and SSOPM-18. Two 15½' x 18' ball mills relocated from the Sacaton Unit were added to the mill in 1989. In 1991, the flotation circuit was improved with the addition of two banks of 1,500 ft3 flotation cells. Emissions from the ball mills are controlled by wet scrubbers SSOPN-6 and SSOPN-7.

Ground ore is pumped to the two flotation sections, where the chalcopyrite mineral is separated from the waste rock by the flotation process. Flotation is a chemical-mechanical process in which the mineral surfaces are coated with a chemical and agitated with air and pine oil for froth. The finely ground mineral particles attach themselves to air bubbles, float to the top, and are mechanically removed from the flotation cells. Lime is added to support the flotation process. Emissions from the lime transfer operations are controlled using enclosures and dust collector SSOPM-17.

The ore is upgraded in column flotation cells (8' diameter x 50' high) and is filtered and shipped in railroad cars to Asarco Smelters at Hayden, Arizona, and El Paso, Texas. Finely ground rejected material from the flotation process, referred to as tailing, is transported by gravity in large diameter pipes to storage areas below the mill site. Water is recovered from the tailings storage areas and reused in the processing procedure. The in-plant water recovery system recovers and reuses 70% to 80% of the water needs of the concentrator. Fresh water is pumped 3½ miles from the valley located to the east of the mine and is used as makeup water.

The mining activities are primarily a source of fugitive PM, PM_{10}, and $PM_{2.5}$ emissions. Where possible, particulate emissions are controlled using enclosures, water sprays, and dust collectors (dry dust collectors and wet scrubbers). The mission floatation circuit is potentially a source of VOC emissions in the form of carbon disulfide (CS2) that could be potentially formed in the process. The PTE for emissions from the activities are provided under the Mission Circuit section in the PTE calculations included as Appendix F.

3.2.2 South Mill Circuit

(1). Primary Crusher and Stockpile

Ore from the mine is transferred using haul trucks to the 54" south primary crusher (PFOPS-1). The crushed ore from the primary crusher is transferred through an apron feeder (PFOPS-0), to

the wear conveyer (10-103). Particulate emissions from these activities are controlled by dust collector SSOPS-1. From the wear conveyer, the ore is transferred to a radial stacker (10-105) that transfers (PFOPS-2) the ore to the south coarse ore stockpile (WFOPS-1) for temporary storage. Emissions from the transfer to the radial stacker are controlled by wet scrubber SSOPS-2.

(2). Mission South Concentrator

Two sets of apron feeders located under the coarse ore stockpile transfer the coarse ore onto the Semi-Autogenous Grinding (SAG) feed conveyers, which transfer the coarse ore directly into 2-28' x 12' SAG mills. Emissions from the drop onto the SAG feed conveyers is controlled by dust collectors SSOPS-3 (30-150A and 30-150B).

The SAG mill discharge is separated using a double deck screen, with the screen oversize going to a recycle crusher circuit, and the undersize going to two 16½'x 19' ball mills for further grinding. Oversize from the SAG mill is sent to an intermediate ore stockpile from where the ore is transferred to a belt conveyer through vibrating feeders. Emissions from this transfer point are controlled by wet scrubber SSOPS-4A. The belt conveyer transfers the oversize to either one of the two omni-cone crushers for further crushing. Emissions from the omni-cone crushing operation and the omni-cone by-pass are controlled by wet scrubber SSOPS-4. Crushed ore from the omni-cone crusher is sent back to the SAG mil.

The ground ore goes to flotation and regrinding where a final copper concentrate is produced in 8' x 50' column cells. Lime is added to support the flotation process. Emissions from the lime transfer operations are controlled using enclosures and dust collector SSOPS-6. The ore is upgraded in column flotation cells (8' diameter x 50' high) and is filtered and shipped in railroad cars to Asarco Smelters at Hayden, Arizona, and El Paso, Texas. Finely ground rejected material from the flotation process, is referred to as tailing, and is transported by gravity in large diameter pipes to storage areas below the mill site. Water is recovered from the storage areas and reused in the processing procedure. The in-plant water recovery system recovers and reuses 70% to 80% of the water needs of the concentrator. Fresh water is pumped 3½ miles from the valley located to the east of the mine and is used as makeup water.

The mining activities are primarily a source of fugitive PM, PM_{10}, and $PM_{2.5}$ emissions. Where possible, particulate emissions are controlled using enclosures, water sprays, and dust collectors (dry dust collectors and wet scrubbers). The south mill floatation circuit is potentially a source of VOC emissions in the form of CS_2 that could be potentially formed in the process. The PTE for emissions from the activities are provided under the South Circuit section in the PTE calculations included as Appendix F.

3.3 By-Products Plant

Mission Complex produces a by-product molybdenum concentrate. This by-product is produced by diverting the copper concentrate from the Mission Mill to the by-products plant. The by-products plant process involves additional flotation where the copper concentrate is chemically retreated, reground, and

refloated to extract a molybdenite concentrate. This concentrate is filtered, dried, and sold for recovery of the contained molybdenum, an alloying element for steel. Production may be temporarily suspended at the by-products plant during times of depressed molybdenum prices. Production can resume when prices recover to stabilize at profitable levels. The moly by-products process is a source of particulate matter emissions from the moly concentrate dryers. The dryers are also a source of other criteria pollutants from the combustion of natural gas. Particulate from the dryers are controlled by wet scrubber SSMP-1.

3.4 Generators

Asarco operates five generators at the Mission Complex. The generators are primarily intended to provide electrical power when power from the main line is not available. These generators include:

a. Mission and North Mill
   i. North Mill Generator
   ii. North Mill Thickener Generator
   iii. Dispatch Location Generator

b. South Mill
   i. South Mill Stationary Generator
   ii. South Mill Tank Hill Generator

The generators are a source of NOx, SOx, $PM/PM_{10}/PM_{2.5}$, VOC, CO, and HAPs from diesel or natural gas combustion. The PTE for emissions from the activities are provided under the Generator section in the PTE calculations included as Appendix F.

3.5 Fuel Storage

Asarco operates the following tanks and associated dispensing equipment for the storage of gasoline and diesel fuel:

Table 2. Fuel Storage Tank List.

Tank Location	Tank Content	Tank Size
Gasoline Loading Facility	Gasoline	20,000 gallon
Tank Farm	Diesel	250,000 gallon
Tank Farm	Diesel	20,000 gallon
Tank Farm	Diesel	20,000 gallon
Tank Farm	Diesel	20,000 gallon

The fuels storage tanks and associated dispensing requirement are a source of VOC and HAPs. HAPs are those that are inherently contained within the gasoline or diesel fuel. The PTE for emissions from the activities are provided under the Storage Tanks section in the PTE calculations included as Appendix F.

3.6 Mine Tailings

The tailings from the Mission Circuit and South Circuit floatation process are transported by gravity in large diameter pipes to storage areas below the mill site. The mission tailings are actively managed at the tailings facility where the spigots/pipes pump the tailings slurry into settlement areas. Water from the tailings facility is extracted for re-use in the facility while the remaining solids are managed by creating berms. Asarco currently operates two active berm building areas (Tailings Dam #4 and Tailings Dam #7), and one stand-by area (Tailings Dam #8). Tailings Dam #5 and #6 are currently not active.

The tailings dams are primarily a source of fugitive PM, PM_{10}, and $PM_{2.5}$ emissions. Where possible, particulate emissions are controlled using smearing, water application (as needed), and application of a dust suppressant (acrylic co-polymer, magnesium chloride), while long term controls are achieved through natural vegetation with the use of biosolids as a soil amendment. The PTE for emissions from the activities are provided under the Wind Erosion Circuit section in the PTE calculations included as Appendix F.

4 Facility-wide Potential to Emit

The Asarco Mission Complex is a source of criteria air pollutants, HAPs, and GHG emissions. Criteria pollutants are primarily particulate matter emissions from the mining and ore-beneficiating process. Particulate are emitted in non-fugitive as well as fugitive emissions. Smaller quantities of other criteria pollutants are also emitted from blasting operations and combustion equipment that support the mining operation. HAP emissions emitted by the site are primarily those metallic HAPs that are contained with the ore, and emitted as particulate matter. To a lesser extent, small contributions to HAP emissions is from fuel (gasoline and diesel) storage and load operations at the site used to support the mining equipment, and combustion based HAPs from stationary combustion equipment (engines, dryers, etc.). GHG emissions from the site are primarily from equipment that supports the mining operations and combust diesel and natural gas.

A summary of the PTE for Asarco Mission Complex is provided in the tables below. Emissions summary is provided for criteria air pollutants, HAPs, and GHG emissions. Based on the PTE, the Asarco Mission Complex will continue to operate as a Class I (Title V major) source, with respect to emissions of $PM/PM_{10}/PM_{2.5}$ emissions being greater than 100 tpy, and an area source with regard to emission of HAPs, where emission level for a single HAP are below 10 tpy, and emissions for cumulative HAPs are below 25 tpy.

Detailed emissions calculations supporting the PTE summaries provided below are included as Appendix F.

Table 3. Potential to Emit Summary - Criteria Air Pollutants and HAPs.

PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	VOC	Total HAP
(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
7,394.24	2,662.23	563.14	209.95	51.98	313.20	11.64	5.21

Table 4. Potential to Emit Summary - Greenhouse Gas.

CO_2	CH_4	N_2O	CO_{2e}
(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
9,636.27	0.17	0.08	9,663.20

5 Proposed Changes to Operating Permit

Asarco is requesting several changes to certain conditions of the Operating Permit. The changes are being requested to reflect current site operations and to correct errors that were inadvertently introduced in the Operating Permit during past revisions. The requested changes are not intended to support any physical changes, changes in the method of operation, changes to permitted facility throughputs, or facility operations that would affect emissions.

A summary of the changes proposed to the Operating Permit are provided below. Included in the description for each proposed change is the location of the affected language in the Operating Permit, the basis or reason for which Asarco is requesting the change to the permit condition language, and the proposed permit language (if applicable).

5.1 Section 1 - Mission Primary Crusher and Stockpile

Permit Reference - Page 21, Section 1.

Requested Revision - In October 2012, Asarco submitted a significant permit revision to the Operating Permit. The permit revision proposed refurbishing substantial portions of the Mission Primary Crusher (Refurbishment Project). These refurbishments included:

- Replacing the existing CR1 crusher with a new crusher;
- Updating crusher motor horsepower from 400 hp to 600 hp;
- Replacing all below ground process equipment, except feeder pans and belts, with new equipment rated at same capacity;
- Upgrading truck dump pockets; and
- Adding a backup wet scrubber at SSOPM-1.

As part of the significant permit revision, Asarco proposed voluntary permit limits to ensure that the increase in particulate emissions from the proposed Refurbishment Project was not significant for PM, PM_{10}, or $PM_{2.5}$. Additionally, the proposed refurbishment project would subject certain affected emission points to the requirements of NSPS at 40 CFR 60 Subpart LL.

A summary of the voluntary limits proposed as part of the Refurbishment Project are as follows:

- Limiting the annual ore throughout for the primary crusher to 14,000,000 tons;

- Limiting the exhaust grain loading for scrubber SSOPM-1 to 0.01 grain/dry standard cubic foot; and
- Including in the Operating Permit requirements for NSPS Subpart LL that would be applicable to emission units that were affected by the standard.

PDEQ permitted the proposed refurbishment project and included the applicable requirements in Part B, Section 1, of the Operating Permit.

At this time as Asarco is submitting this Operating Permit renewal application, the facility has not implemented and does not plan to implement the changes proposed in the October 2012 significant permit revision application for the Refurbishment Project. Asarco is therefore requesting that PDEQ remove the operational limits in Part B, Section 1, of the Operating Permit that are included due to the October 2012 significant permit revision application. Please note that after submittal of the October 2012 significant permit revision application, Asarco has not relied upon any decrease in emissions, as calculated in the October 2012 significant revision application, to effectively net out of PSD for any subsequent projects.

The following is a summary of the changes being proposed to Part B, Section 1, of the Operating Permit. The changes are intended to remove the operational restriction imposed as part of the October 2012 significant permit revision, remove the Mission Primary Crusher and other equipment as an affected source under NSPS Subpart LL, and overall revert the requirements to those that were in affect prior to the submittal of the October 2012 significant permit revision.

(1). Permit Reference: Part B, Section 1.I.A.1

Requested Revision: Delete permit condition Part B, Section 1.I.A.1. The permit condition limits the ore throughput for the Mission Primary Crusher to 14,000,000 ton/year. This ore throughput limit was included for the Refurbishment Project to not trigger PSD. Since the project was never implemented and is not intended to be implemented by Asarco, the annual throughput limit is no longer valid.

(2). Permit Reference: Part B, Section 1.I.A.2, Section II.A.2, Section II.A.3

Requested Revision: Revise the opacity limit for Emission Group A from 10% opacity to 20% opacity. Since the project was never implemented, is not intended to be implemented by Asarco, and

Asarco is retracting the Refurbishment Project significant permit revision application, Emission Group A is not considered an affected source under NSPS Subpart LL.

(3). Permit Reference: Part B, Section 1.I.B.1

Requested Revision: Delete permit condition Part B, Section 1.I.B.1. The permit condition limits the emission rate of SSOPM-1 to 0.01 grains/dscm. This emission limit for SSOPM-1 was included for the Refurbishment Project to not trigger PSD. Since the project was never implemented, is not intended to be implemented by Asarco, and Asarco is retracting the Refurbishment Project significant permit revision application, the emission limit imposed on SSOPM-1 is no longer valid.

(4). Permit Reference: Part B, Section 1.I.AB.4

Requested Revision: Revise the permit condition to indicate that the requirements of the condition are only applicable to SSOPM-2, which currently is an affected source under NSPS Subpart LL and was an affected source under NSPS Subpart LL prior to the submittal of the Refurbishment Project significant permit revision. Since the project was never implemented, is not intended to be implemented by Asarco, and Asarco is retracting the Refurbishment Project significant permit revision application, SSOPM-1 is not considered affected under NSPS Subpart LL.

Proposed permit condition is as follows:

"SSOPM-2 Only - The Permittee shall not cause to be discharged into the atmosphere from an affected facility any process fugitive emissions that exhibit greater than 10 percent opacity. Process fugitive emissions are emissions from an affected facility that are not collected by a capture system."

(5). Permit Reference: Part B, Section 1.II.B.1

Requested Revision: Delete reference to SSOPM-1 in this section. Since the Refurbishment Project was never implemented, is not intended to be implemented by Asarco, and Asarco is retracting the significant permit revision application, SSOPM-1 is not considered affected under NSPS Subpart LL.

(6). Permit Reference: Part B, Section 1.II.B.2

Requested Revision: Delete permit condition Part B, Section 1.II.B.2. The permit condition is not applicable to SSOPM-1 or SSOPM-2. Since the Refurbishment Project was never implemented, is not intended to be implemented by Asarco, and Asarco is retracting the significant permit revision application, SSOPM-1 is not considered an affected source under NSPS Subpart LL. The permit condition is not applicable to SSOPM-2. SSOPM-2 is a hydrostatic precipitator and therefore does not use water flow as an indicator of whether the equipment is operating properly.

(7). Permit Reference: Part B, Section 1.II.B.4

Requested Revision: Revise the permit condition to indicate that the requirements of the condition are only applicable to SSOPM-2, which currently is an affected source under NSPS Subpart LL, and was an affected source under NSPS Subpart LL prior to the submittal of the Refurbishment Project significant permit revision. Since the Refurbishment Project was never implemented, is not intended to be implemented by Asarco, and Asarco is retracting the significant permit revision application, SSOPM-1 is not considered affected under NSPS Subpart LL.

Proposed permit condition is as follows:

"SSOPM-2 Only - If the observer sees any process fugitive emissions from an affected facility that, on an instantaneous basis, appears to exceed 10 percent opacity, then the Permittee shall conduct an EPA Reference Method 9 observation of the plume. If the observed opacity exceeds 10 percent this shall be recorded and reported as an excess emission and permit deviation."

(8). Permit Reference: Part B, Section 1.III.B

Requested Revision: Delete the reference to SSOPM-1. Since the Refurbishment Project was never implemented, is not intended to be implemented by Asarco, and Asarco is retracting the significant permit revision application, SSOPM-1 is not considered affected under NSPS Subpart LL.

(9). Permit Reference: Part B, Section 1.IV Section Header, Section 1.IV.B

Requested Revision: Delete reference to SSOPM-1. Asarco is proposing to retract the Refurbishment Project significant permit revision application and therefore SSOPM-1 is not considered affected under NSPS Subpart LL.

(10). Permit Reference: Part B, Section 1.V

Requested Revision: Delete reference to wet scrubber SSOPM-1. The control equipment is currently not subject to an emission limit. This emission limit for SSOPM-1 was included for the Refurbishment Project to not trigger PSD. Since the Refurbishment Project was never implemented, is not intended to be implemented by Asarco, and Asarco is retracting the significant permit revision application, SSOPM-1 is not considered affected under NSPS Subpart LL. Therefore, the emission limit imposed on SSOPM-1 is no longer valid.

5.2 Section 2A - Emission Group A

Permit Reference - Page 32, Section 2A.II.A.2

Requested Revision - Emission Group A is an affected facility under 40 CFR 60 Subpart LL and subject to a 10% opacity standard. This NSPS opacity limit is more restrictive that the 20% opacity that is currently provided in the permit condition. Asarco is requesting that PDEQ update the 20% opacity limit with the 10% opacity limit imposed by NSPS LL, along with updating the regulatory citation provided in the Operating Permit.

Proposed permit condition is as follows:

"If the observer sees a plume from the exterior of the building3 housing the emission points identified in Group A, that on an instantaneous basis, appears to exceed 10 percent opacity, then the Permittee shall take an EPA Reference Method 9 observation of the plume. If the observed opacity exceeds 10 %, this shall be recorded and reported as an excess emission and permit deviation."

5.3 Section 2A - Emission Group B

Permit Reference - Page 33, Section 2A.II.B.5

Requested Revision - Asarco is requesting that PDEQ delete reference to SSOPM-4 through SSOPM-7. Control equipment SSOPM-4 through SSOPM-7 are dry dust collectors subject to the stack opacity standard of 7% opacity, as provided at 40 CFR 60 Subpart LL. This 7% opacity limit is already included in Section 2A.II.B.8.

Proposed permit condition is as follows:

"If the observer sees a plume from wet scrubber stack SSOPM-3 that, on an instantaneous basis, appears to exceed 20 percent opacity, then the Permittee shall take an EPA Reference Method 9 observation of the plume. If the observed opacity exceeds 20 percent, this shall be recorded and reported as an excess emission and permit deviation."

5.4 Section 2A - Emission Group B

Permit Reference - Page 33, Section 2A.II.B.7 and Section 2A.II.B.7

Requested Revision - The correct control equipment ID is SSOPM-4 and not SSOPN-4. Please replace SSOPN-4 with SSOPM-4.

Proposed permit conditions are as follows:

Section 2A.II.B.7 - "If the observer sees a plume from any affected facility using a dry dust collector (emission points SSOPM-4 through 7) that, on an instantaneous basis, appears to exceed 7 percent opacity, then the Permittee shall take an EPA Reference Method 9 observation of the plume."

Section 2A.II.B.8 - "If the observer, during the visual survey, does not see any plume from any affected facility using a dry dust collector (emission points SSOPM-4 through SSOPM-7) that, on an instantaneous basis, appears to exceed the 7 percent opacity standard, then the observer shall keep a record of the name of the observer, the date on which the observation was made, the location, and the results of the observation."

5.5 Section 2A - Emission Group B

Permit Reference - Page 34, Section 2A.IV.B

Requested Revision - Asarco is requesting to delete the term "through SSOPM-7" from the permit condition. Control equipment SSPOM-4 through SSOPM-7 are dry dust collectors and not wet scrubbers and are therefore not subject to the requirements associated with the scrubber pressure loss (or gain) or liquid flow rate as provided in the NSPS at 40 CFR 60 Subpart LL - Standards of Performance for Metallic Mineral Processing Plants.

Proposed permit condition is as follows:

"After the initial performance test of wet scrubber SSOPM-3, the owner, or operator shall submit semiannual reports to the Control Officer of occurrences when the measurements of the scrubber pressure loss (or gain) or liquid flow rate differ by more than ±30 percent from the average obtained during the most recent performance test."

5.6 Section 3 - Emission Group A

Permit Reference - Page 36, Section 3

Requested Revision - Emission Group A is missing the existing emission points HFOPM-3 and HFOPM-4, which represent the concentrate transfer operations at the Mission Concentrator as follows:

HFOPM-3: Transfer Point of Concentrate Product into Rail Cars at Concentrate Loading Area East.

HFOPM-4: Transfer Point of Concentrate Product at Concentrate Loading Area North. Transfer points included are: (1) Transfer of concentrate from conveyer belt into haul truck; (2) Transfer of concentrate from the haul truck to concrete pad; and (3) Loading of concentrate from concrete pad into semi-truck for offsite transfer.

Applicable requirements for HFOPM-3, HFOPM-4, which constitutes Emission Group A, are provided below:

<u>I. Emission Limitations and Standards</u>

(1). The Permittee shall not cause to be discharged into the atmosphere any process fugitive emissions that exhibit greater than 10 percent

opacity. Process fugitive emissions are emissions from an affected facility that are not collected by a capture system.

(2). At all times, including periods of startup, shutdown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate any affected facility in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Control Officer which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

II. Monitoring Requirements

(1). The Permittee shall demonstrate compliance with the opacity limitation in I.A.1 of this Section by monitoring the emissions from HFOPM-3 and HFOPM-4 biweekly (every two weeks).

(2). If the observer sees a plume that on an instantaneous basis appears to exceed 10 percent opacity, then the Permittee shall take an EPA Reference Method 9 observation of the plume. If the observed opacity exceeds 10 percent, this shall be recorded and reported as an excess emission and permit deviation.

5.7 Section 3 - Emission Group C

Permit Reference -	Page 36, Section 3
Requested Revision -	Section 3 - Mission Concentrator, Emission Group C, is currently missing the existing emission point HFOPN-3. Periodically, Asarco will undertake ground cleanup activities at the Mission Concentrator as part of the good housekeeping processes implemented at the site. Cleanup is typically performed once per week. Ore collected during the cleanup is transferred back to the Mission Concentrator (Ball Mill #13 and Ball Mill #14) using the cleanup conveyer 311-96a. Emissions from the transfer of ore to the cleanup conveyer are controlled by an enclosure and are represented as HFOPN-3 in the emission's calculations. Emissions from the transfer of ore from the cleanup conveyer to the ball mill feed conveyer are controlled by the existing wet scrubber SSOPN-7.

5.8 Section 4 - Mission North Primary Crusher and Stockpile

Permit Reference - Section 4

Requested Revision - Emissions equipment and associated compliance requirements for the North Crushing Circuit are included in Section 4 of the Operating Permit. Asarco is requesting that PDEQ delete Section 4 from the Operating Permit. For the past few years, Asarco has not operated the North Crushing circuit. Crushing equipment and associated pollution control equipment was maintained on standby. However, Asarco does not anticipate operating the associated crushing equipment in the future and is therefore requesting the removal of the associated equipment from the Operating Permit. Crushing and transfer equipment associated with the North Crushing circuit will be maintained onsite.

5.9 Section 5 - Mission North Combustion Off Gases

Permit Reference - Section 5.IV.A

Requested Revision - Section IV.A of the Operating Permit incorrectly refers to a 500 hours per year limit for the Mission North generators. All three generators operate under a permit limit of 1,000 hours per year, recorded on a 12-month rolling basis, as provided in Section 5.II.E of the Operating Permit. Therefore, please revise Section 5.IV.A as provided below.

Proposed permit condition is as follows:

"Permittee shall keep records for each generator demonstrating compliance with the <u>1,000-hours per year</u> twelve month rolling operational hour limit for each CI ICE unit per II.E of this section. All records shall be maintained for five years."

5.10 Section 6A and Section 6B

Permit Reference - Section 6A and Section 6B

Requested Revision - Operations at the South Mill were developed under the existing "pre-expansion" (Section 6A) and "post expansion" (Section 6B) sections. Asarco is now in the post construction phase (defined as the installation of the new control equipment and operation of the new grinding equipment in South Mill), which is regulated under Section 6B of the Title V permit. Therefore, Section 6A of the Title V permit is no longer

in effect. Additionally, Asarco is requesting that Section 6B of the Operating Permit be renamed "Section 6."

5.11 Section 6B - Emission Group B - SSOPS-2

Permit Reference - Page 61, Section 6B.I.B.1.a, Section 6B.I.B.1.b, Section 6B.I.B.1.c

Requested Revision - Asarco submitted a South Mill expansion application that was received by PDEQ on April 25, 2014. Requirements imposed on the South Mill after the expansion was completed are included in Section 6B of the Operating Permit. Implementation of the south mill expansion made SSOPS-2 subject to a particulate matter emission limit of 0.01 grains/dscf. This emission rate was proposed by Asarco as part of the potential to emit for the proposed south mill operation and is more restrictive than the process based emission limit currently included in the permit.

Proposed permit condition is as follows:

"The Permittee shall not cause to be discharged into the atmosphere any stack emissions from any affected facility (including air pollution control equipment) that contain particulate matter in excess of 0.01 grains per dry standard cubic foot."

5.12 Section 6B - Emission Group B - SSOPS-1

Permit Reference - Page 61, Section 6B.I.B.2.a

Requested Revision - Asarco submitted a South Mill expansion application that was received by PDEQ on April 25, 2014. Requirements imposed on the South Mill after the expansion was completed are included in Section 6B of the Operating Permit. Implementation of the South Mill expansion made SSOPS-1 subject to an emission limit of 0.003 grains/dscf. This emission rate was proposed as part of the potential to emit for the proposed South Mill operation. It is currently unclear why permit condition Section 6B.I.B.2.a prescribes an emission rate of 0.05 gram/dscm (or 0.022 grain/dscf) as this emission rate is higher than the 0.003 grains/dscf used to estimate the PTE for SSOPS-1 as part of the PSD avoidance for the South Mill expansion. Asarco is therefore requesting the permit condition be revised to reflect the SSOPS-1 emission rate used in the PSD avoidance application for the South Mill circuit.

Proposed permit condition is as follows:

"The Permittee shall not cause to be discharged into the atmosphere any stack emissions from any affected facility (including air pollution control equipment) that contain particulate matter in excess of 0.003 grains per dry standard cubic foot."

5.13 Section 6B - Emission Group B

Permit Reference - Page 64, Section 6B.II.B.4

Requested Revision - Please correct the numbering of the condition. Section 6B.II.B.4 should be re-numbered Section 6B.II.B.3

5.14 Section 7A

Permit Reference - Page 67, Section 7A

Requested Revision - Operations at the South Mill were developed under the existing "pre-expansion" (Section 7A) and "post expansion" (Section 7B) sections. Asarco is now in the post construction phase (defined as the installation of the new control equipment and operation of the new grinding equipment in South Mill), which is regulated under Section 7B of the Title V permit. Therefore, Section 7A of the Title V permit is no longer in effect. Additionally, Asarco is requesting that Section 7B of the Operating Permit be renamed "Section 7."

5.15 Section 7B - Emission Group B - SSOPS-3

Permit Reference - Page 77, Section 7B.I.B.2.a

Requested Revision - The emission rate for SSOPS-3 (30-150A and 30-150B) is limited to 0.003 grains/dry standard cubic foot, in accordance with the South Mill expansion permit application, and not 0.003 grams per dry standard cubic meter, as currently stated in the permit condition.

Proposed permit condition is as follows:

"The Permittee shall not cause to be discharged into the atmosphere any stack emissions from any affected facility (including air pollution control equipment) that contain particulate matter in excess of 0.003 grains per dry standard foot."

5.16 Section 7B - Emission Group B - SSOPS4/SSOPS-4A

Permit Reference - Page 77, Section 7B.I.B.3.a

Requested Revision - The emission rate for SSOPS-4 and SSOPS-4A is limited to 0.01 grains/dry standard cubic foot, in accordance with the South Mill expansion permit application, and not 0.01 grams per dry standard cubic meter, as currently stated in the permit condition.

Proposed permit condition is as follows:

"The Permittee shall not cause to be discharged into the atmosphere any stack emissions from wet scrubber SSOPS-4 and SSOPS-4a that: contain particulate matter in excess of 0.01 grains per dry standard cubic foot."

5.17 Section 7B - Emission Group B - SSOPS4/SSOPS-4

Permit Reference - Page 77, Section 7B.I.B.3.d

Requested Revision - Asarco is requesting to delete this permit condition. The permit condition pertains to control equipment SSOPS-3. Requirements for control equipment SSOPS-3 (30-150A and 30-150B) have already been included in Section 7B.I.B.2 of the Operating Permit.

5.18 Section 7B - Emission Group A

Permit Reference - Page 78, Section 7B.II.A.1

Requested Revision - The permit condition is missing the existing emission point HFOPS-3 (Transfer of Oversize Ore to Intermediate Ore Stockpile from Belt 20-250). Please update the permit condition to include HFOPS-3. Additionally, there are several emission points listed in this permit condition that are omitted from the emission point table on Page 75 of the Operating Permit for Emission Group A. Asarco is requesting that the emission point table on Page 75 be updated with all the emission points from Section 7B.II.A.1, with the addition of HFPOS-3.

5.19 Section 7B - Reporting Requirements

Permit Reference - Page 80, Section 7B.IV

Requested Revision - Please delete reference to "(Wet Scrubber SSOPS-4 only)" in the section header since the section applies to emission points under both Emission Group A and Emission Group B.

5.20 Section 7B - Reporting Requirements

Permit Reference - Page 80, Section 7B.IV.B

Requested Revision - SSOPS-4A is an affected facility under NSPS Subpart LL and is therefore subject to the reporting requirements of Section 7B.IV.B. Please insert control equipment SSOPS-4A in Section 7B.IV.B.

Proposed permit condition is as follows:

"After the initial performance test of wet scrubber SSOPS-4 and SSOPS-4A, the owner or operator shall submit semiannual reports to the Control Officer of occurrences when the measurements of the scrubber pressure loss (or gain) or liquid flow rate differ by more than ±30 percent from the average obtained during the most recent performance test."

5.21 Section 7B - Notification

Permit Reference - Page 81, Section 7B.IV.E

Requested Revision - Asarco is requesting to delete this permit condition. The facility is currently operating under Section 7B (post-expansion). A notification of the change was provided to PDEQ in a letter dated March 2, 2015. As indicated in the notification letter, commencement of the installation of equipment commenced on or after March 9, 2015.

5.22 Section 10 - Compliance Assurance Monitoring

Permit Reference - Page 98, Section 10

Requested Revision - For all references to the monitoring approach for the scrubbing liquid, Asarco is requesting to replace the term "change in scrubbing liquid" with simply "scrubbing liquid" since the facility does not measure the change in the scrubber water flow rate, as we do for change in the pressure across the scrubber or baghouse, but rather the absolute scrubber water flow rate.

5.23 Section 10 - Compliance Assurance Monitoring

Permit Reference - Page 108, CAM Plan 4, Section 10.VI.B.3.a and Section 10.VI.B.3.b

Requested Revision - Asarco is requesting to revise the differential pressure indicator range for Section 10.VI.B.3.a from 0.5-6" H_2O to 0-6"H_2O, in line with other similar dry dust collectors for the facility.

Proposed permit condition is as follows:

"Pressure differential range for the dust collectors shall be set initially as 0.0 to 6 inches of water."

Additionally, Asarco is requesting to delete Section 10.VI.B.3.b of the permit condition. Developing an indicator range for differential pressure as +/- 30% of the average differential pressure recorded during the source test does not readily apply to a dry dust collector, and is more applicable to wet scrubber. The indicator range for the differential pressure for the dry dust collectors will be established in accordance with Section 10.VI.B.3.a.

6 Air Quality Regulatory Requirements

6.1 PDEQ Requirements

A summary of the PDEQ requirements applicable to specific emission units at the Mission Complex, the regulatory citation of the requirement, and the associated compliance mechanisms used by Asarco to comply with these requirements is provided below.

Table 5. Applicable PDEQ Requirements.

Regulatory Citation	Requirement	Affected Emission Units	Compliance Method
17.16.040	Limit the Maximum Allowable Average Opacity to 20%[2]	Ore crushing and transfer points associated with Mission Circuit, North Circuit, and South Circuit.	Bi-weekly visible emissions observations are performed by the facility for each emission point (or emission point group where emission points are located within a building). Opacity observations are performed by individuals with valid Method 9 certification.
17.16.050	Limit the Maximum Allowable Average Opacity to 20% (Except for sources located within the boundaries of the Tohono O'Odhamand Reservations)	Non-point fugitive emission sources associated with the mining operation and tailings facility.	The facility operates in accordance with a Tailings Management Plan (TMP) and conducts bi-weekly visible emissions observations. A copy of the TMP has been submitted to PDEQ. The TMP is reviewed annually to ensure that implemented control measures are effective, and is updated as necessary.
17.16.060	Control of fugitive dust	Non-point fugitive emission sources associated with the mining operation and tailings facility.	The facility operates in accordance with a Tailings Management Plan (TMP) and conducts bi-weekly visible emissions observations. A copy of the TMP has been submitted to PDEQ. The TMP is reviewed annually to ensure that implemented control measures are effective, and is updated as necessary.

[2] Certain emission points in the Mission Circuit, North Circuit, and South Circuit are affected under 40 CFR 60 Subpart LL and are subject to a lower opacity limit of 10% for process fugitives and 7% for stack emissions. Where applicable, the more stringent limit has been incorporated in the Operating Permit.

Regulatory Citation	Requirement	Affected Emission Units	Compliance Method
17.16.100	Control of particulate matter emission	Facility-wide	The facility implements controls in accordance with the requirements of the Operating Permit. The controls include installation and operation of pollution control equipment (active and passive), wetting of road and material surfaces, and conducting period testing and observation to ensure effectiveness of the control measures.
17.16.110	Particulate emissions from Storage Piles	Coarse ore storage piles, intermediate ore storage piles, concentrate storage piles	The facility implements controls in accordance with the requirements of the Operating Permit. The controls include wetting of material surfaces with spray bars and conducting period observations to ensure effectiveness of the control measures.
17.16.120	Particulate emissions from Mineral Tailings	Mineral Tailings Storage Facility	The facility operates in accordance with a Tailings Management Plan and conducts bi-weekly visible emissions observations. A copy of the TMP has been submitted to PDEQ. The TMP is reviewed annually to ensure that implemented control measures are effective, and is updated as necessary.
17.16.130	Limit the Maximum Allowable Average Opacity to 20%	Ore crushing and transfer points associated with Mission Circuit, North Circuit, and South Circuit that are controlled with an active control device (dry dust collector or wet scrubber)	Bi-weekly visible emissions observations are performed by the facility for each emission point (or emission point group where emission points are located within a building). Opacity observations are performed by individuals with valid Method 9 certification.
17.16.230	Standards of performance for storage vessels for petroleum liquids.	Gasoline storage tank (20,000 gallon)	• The gasoline storage tank and diesel storage tanks are equipped with a submerged fill (17.16.230.B) • All pumps and compressors are equipped with mechanical seals (17.16.230.D) • Records of the total quantity of gasoline throughput for the site are maintained by the facility.

Regulatory Citation	Requirement	Affected Emission Units	Compliance Method
17.16.340 - Standards of performance for stationary rotating machinery	• Emission rate limit: $E = 1.02Q$ where: E = the maximum allowable particulate emissions rate in pounds-mass per hour. Q = the heat input in million BTU per hour. • Opacity Limit - 40% (except during cold start) • SO_2 Limit - 1 lb/MMBtu	• North Mill Generator • North Mill Thickener Generator • Dispatch Generator • (South Mill) Stationary Emergency Generator • (South Mill Tank Hill) Stationary Emergency Generator	The emission units are subject to NSPS requirements of 40 CFR 60 subpart IIII, JJJJ, and NESHAP requirements at 40 CFR 63 Subpart ZZZZ (please refer to Section 6.2 and 6.3 for equipment specific applicability). Compliance with the emission rate limit is demonstrated by complying with the applicable emissions and operational limits of the NSPS and NESHAP. Compliance with SO_2 emission rate limit is demonstrated by combusting low sulfur fuel with a maximum fuel sulfur content of 15 ppm. The facility conducts quarterly visible emissions observations on the generator exhaust to demonstrate compliance with the opacity limits.
17.16.360 - Standards of Performance for Nonferrous Metals Industry Sources	• $E = 17.31P^{0.16}$ Where: E = the maximum, allowable particulate emission rate in pounds-mass per hour. P = the process weight rate in tons-mass per hour. • Moly Dryer - 90% sulfur reduction, if dryer is operated at temperatures greater than 700 F	Mission Circuit, North Circuit, South Circuit, Moly Circuit	• The facility implements controls in accordance with the requirements of the Operating Permit. The controls include installation and operation of pollution control equipment (active and passive), wetting of road and material surfaces, and conducting period testing and observation to ensure effectiveness of the control measures. Stack emissions are measured in accordance EPA Method 5 or Method 17. • Moly Dryer - The facility continuously monitors the temperature of the Moly Dryer to ensure that the temperature is maintained below 700 F.
17.16.490.A.46	Subpart LL—Metallic Mineral Processing Plants.	Various emission points in Mission Circuit, North Circuit, and South Circuit	Refer to Section 6.2 for applicable requirements.
17.16.490.A.83	Subpart IIII - Stationary Compression Ignition Internal Combustion Engines	• (North Mill) Generator • (North Mill Thickener) Generator • (Dispatch Location) Generator	Refer to Section 6.2.2 for applicable requirements.

Regulatory Citation	Requirement	Affected Emission Units	Compliance Method
17.16.490.A.84	Subpart JJJJ - Stationary Spark Ignition Internal Combustion Engines.	(South Mill Tank Hill) Stationary Emergency Generator	Refer to Section 6.2.3 for applicable requirements.
17.16.530.A.83	Subpart ZZZZ—National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.	(South Mill) Stationary Emergency Generator	Refer to Section 6.3.1 for applicable requirements.
17.16.530.A.108	Subpart CCCCCC—National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities.	Gasoline Dispensing Facility	Refer to Section 6.3.2 for applicable requirements.

6.2 New Source Performance Standard

6.2.1 40 CFR Subpart 60 Subpart LL - NSPS for Metallic Mineral Processing Plants

Certain equipment at the Asarco Mission Complex are considered affected facility and subject the emissions, monitoring, recordkeeping, and reporting requirements under the NSPS at 40 CFR 60 Subpart LL as referenced by PDEQ regulations at 17.16.490.A.46. A summary of the affected facilities and the applicable requirements is provided below.

6.2.1.1 Process Fugitive Emission Points

A list of the process fugitive emission points is provided in Table 6 below. The associated applicable requirements of NSPS Subpart LL are included in Table 7.

Table 6. Affected Emission Points - Process Fugitives - NSPS Subpart LL.

Emission Group[3]	Process/Unit Description	Emission Point Numbers
Mission Secondary Crusher - Section 2 and Section 2A		
A	Main Secondary Crusher	307-E3, 307-E4
A	Tertiary Crushers	307-E12, 307-E13, M307-E54
A	Double Deck Screens	M307-E1, E2, E5, E6, E14, E15, E55
Mission Concentrator - Section 3		
A	Main Secondary Crusher	307-E3, 307-E4
A	Tertiary Crushers	307-E12, 307-E13, M307-E54
Mission Concentrator - Section 6B[4]		
A	54" Mission South Primary Gyratory Crusher and Transfer to 54" Belt Conveyor	PFOPS-1
A	Ore dump for the South Crusher and Apron Feeder	PFOPS-0
Mission Concentrator - Section 7B[5]		
A	Omni Cone Crushers	PFOPS-11 and PFOPS-12
A	Feeders	PFOPS-9
A	Transfer Point	PFOPS-10, PFOPS-13

Table 7. NSPS Subpart LL - Applicable Requirements - Process Fugitive Emissions.

Requirement	Regulatory Citation	Emission/Operational Limit	Compliance Demonstration
Opacity Limit	40 CFR 60.382(b)	10%	Bi-weekly visible emissions observations are performed by certified observers in accordance with the requirements of the Operating Permit.
Particulate Emission Rate Limit	None	n/a	n/a
Monitoring Requirement	None	n/a	n/a
Recordkeeping and Reporting	None	n/a	Records of bi-weekly opacity observation, in accordance with the requirements of the Operating Permit, are maintained by the facility.
Testing	None	n/a	

6.2.1.2 Point Sources - Scrubbers

A list of the scrubbers considered affected under NSPS Subpart LL is provided in Table 8 below. The associated applicable requirements of NSPS Subpart LL are included in Table 9.

[3] Section 5 of this renewal application is requesting removal of the applicability of NSPS LL to certain emission points form the Mission Primary Crusher.
[4] Asarco is requesting renaming Section 6B to Section 6. Please refer to Section 5 of this permit renewal application for additional information.
[5] Asarco is requesting renaming Section 7B to Section 7. Please refer to Section 5 of this permit renewal application for additional information.

Table 8. Affected Emission Points - Point Sources - Wet Scrubbers - NSPS Subpart LL.

Emission Group[6]	Control Equipment Type	Emission Point Number
Mission Primary Crusher - Section 1		
B	Hydrostatic Precipitator	SSOPM-2
Mission Secondary Crusher - Section 2		
B	Wet Scrubber	SSOPM-3
B	Wet Scrubber	SSOPM-4
B	Wet Scrubber	SSOPM-5
B	Wet Scrubber	SSOPM-6
B	Wet Scrubber	SSOPM-7
Mission Concentrator - Section 3		
B	Wet Scrubber	SSOPN-7
Mission South Primary Crusher and Stockpile - Section 6B[7]		
B	Wet Scrubber	SSOPS-4
B	Wet Scrubber	SSOPS-4A

Table 9. NSPS Subpart LL - Applicable Requirements - Point Sources - Wet Scrubbers.

Requirement	Regulatory Citation	Emission/Operational Limit	Compliance Demonstration
Opacity Limit	None	n/a	n/a
Particulate Emission Rate Limit	40 CFR 60.382(a)(1)	0.05 g/dscm	Initial source tests to demonstrate compliance with NSPS LL have been completed. Source tests are performed in accordance with EPA Method 5 or Method 17.
Monitoring Requirement	40 CFR 60.384(a)	Install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within ±250 Pascals (±1 inch water) gauge pressure and must be calibrated on an annual basis in accordance with manufacturer's instructions.	The facility has installed differential pressure gauges to measure the change in the gas stream pressure across the scrubber on all affected control devices. All differential pressure gauges meet the accuracy requirements and are calibrated annually.
	40 CFR 60.384(b)	Install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the scrubbing liquid flow rate to a wet scrubber. The monitoring device must be certified by the manufacturer to	The facility has installed flow gauges to measure the scrubber liquid flow rate on all affected control devices. All flow gauges meet the accuracy requirements and

[6] Section 5 of this renewal application is requesting removal of the applicability of NSPS LL to certain emission points form the Mission Primary Crusher.
[7] Asarco is requesting renaming Section 6B to Section 6. Please refer to Section 5 of this permit renewal application for additional information.

Requirement	Regulatory Citation	Emission/Operational Limit	Compliance Demonstration
		be accurate within ±5 percent of design scrubbing liquid flow rate and must be calibrated on at least an annual basis in accordance with manufacturer's instructions.	are calibrated annually.
Testing	40 CFR 60.385(a)	Conduct a performance test	An initial performance test has been completed and results of the tests provided to PDEQ. Subsequent tests are performed, if needed, as required by the Operating Permit.
Recordkeeping	40 CFR 60.385(b)	Weekly record the change in pressure of gas stream across the scrubber and scrubbing liquid flow rate.	Records are maintained by the facility.
Reporting	40 CFR 60.385(c)	Report when the scrubber pressure loss (or gain) or liquid flow rate differ by more than ±30 percent from the average obtained during the most recent performance test.	The report is submitted to PDEQ for each semi-annual operating period.

6.2.1.3 Point Sources - Dry Dust Collectors

A list of the dry dust collectors considered affected under NSPS Subpart LL is provided in Table 10 below. The associated applicable requirements of NSPS Subpart LL are included in Table 11.

Table 10. Affected Emission Points - Point Sources - Dry Dust Collectors - NSPS Subpart LL.

Emission Group[8]	Control Equipment Type	Emission Point Number
Mission Secondary Crusher - Section 2A		
B	Dry Dust Collector	SSOPM-4
B	Dry Dust Collector	SSOPM-5
B	Dry Dust Collector	SSOPM-6
B	Dry Dust Collector	SSOPM-7
Mission Concentrator - Section 3		
B	Dry Dust Collector	SSOPN-6
B	Dry Dust Collector	SSOPM-8
B	Dry Dust Collector	SSOPM-9
B	Dry Dust Collector	SSOPM-10
B	Dry Dust Collector	SSOPM-11
B	Dry Dust Collector	SSOPM-12
B	Dry Dust Collector	SSOPM-13
Mission South Primary Crusher and Stockpile - Section 6B[9]		
B	Dry Dust Collector	SSOPS-1
B	Dry Dust Collector	SSOPS-3 (30-150A and 30-150B)

Table 11. NSPS Subpart LL - Applicable Requirements - Process Fugitive Emissions.

Requirement	Regulatory Citation	Emission/Operational Limit	Compliance Demonstration
Opacity Limit	40 CFR 60.382(a)(2)	7%	Bi-weekly visible emissions observations are performed by certified observers in accordance with the requirements of the Operating Permit.
Particulate Emission Rate Limit	40 CFR 60.382(a)(1)	0.05 g/dscm	Initial source tests to demonstrate compliance with NSPS LL have been completed. Source tests are performed in accordance with EPA Reference Method 5 or RM 17.
Monitoring Requirement	None	n/a	n/a
Recordkeeping	None	n/a	n/a
Reporting	None	n/a	n/a

[8] Section 5 of this renewal application is requesting removal of the applicability of NSPS LL to certain emission points from the Mission Primary Crusher.

[9] Asarco is requesting renaming Section 6B to Section 6. Please refer to Section 5 of this permit renewal application for additional information.

6.2.2 *40 CFR 60 Subpart IIII - NSPS for Stationary Compression Ignition Internal Combustion Engines*

The North Mill Generator (MM-GEN-AD), North Mill Thickener Generator (MM-GEN-TH), and the Dispatch Location Generator (MM-GEN-DSP), are subject to applicable emission limits under the NSPS at 40 CFR 60 Subpart IIII - Standards Of Performance For Stationary Compression Ignition Internal Combustion Engines. A summary of the applicable emission limits under 40 CFR 60 Subpart IIII is provided in the table below.

Table 12. NSPS Subpart III - Applicable Emission Limits.

Emission Unit	Emission Limit	Operational Limit	Compliance Demonstration
North Mill Generator (MM-GEN-AD)	NOx + NMHC - 4.7 g/kW-hr CO - 5 g/kW-hr PM - 0.4 g/kW-hr Fuel Sulfur - 15 ppm Fuel Cetane Index >= 40 OR Aromatic Content < 35% (vol)	The engines are currently limited to operating 1,000 per year (emergency and non-emergency operation).	• The facility maintains a manufacturer emissions certification to demonstrate compliance with the applicable emission limit. • The facility maintains documentation from the fuel supplier demonstrating that all fuel supplied to the facility has a maximum fuel sulfur of 15 ppm, has a fuel cetane index greater than 40, or has aromatic content less than 35%. • Operation and maintenance of the engines in accordance with the manufacturer requirements. • Engine operating hours for emergency and non-emergency operation.
North Mill Thickener Generator (MM-GEN-TH)	NOx - 0.40 g/kW-hr NMHC - 0.19 g/kW-hr CO - 5 g/kW-hr PM - 0.02 g/kW-hr Fuel Sulfur - 15 ppm Fuel Cetane Index >= 40 OR Aromatic Content < 35% (vol)		
Dispatch Location Generator (MM-GEN-DSP)	NOx - 0.40 g/kW-hr NMHC - 0.19 g/kW-hr CO - 5 g/kW-hr PM - 0.02 g/kW-hr Fuel Sulfur - 15 ppm Fuel Cetane Index >= 40 OR Aromatic Content < 35% (vol)		

6.2.3 *40 CFR 60 Subpart JJJJ - NSPS for Stationary Spark Ignition Internal Combustion Engines*

The Mission South Tank Hill Generator (SMTH-EME-GEN) is subject to applicable emission limits under the NSPS at 40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. A summary of the applicable emission limits under 40 CFR 60 Subpart JJJJ is provided in the table below.

Table 13. NSPS Subpart JJJJ - Applicable Emission Limits.

Emission Unit	Emission Limit	Operational Limit	Compliance Demonstration
South Mill Tank Hill Generator (SMTH- EME-GEN	HC + NOx - 13.4 g/kW-hr CO - 519 g/KW-hr	• Maintenance checks and readiness testing - 100 hours. • Non-emergency - 50 hours (counted towards the 100 hours for maintenance checks and readiness testing).	• The facility maintains a manufacturer emissions certification to demonstrate compliance with the applicable emission limit. • Operation and maintenance of the engines in accordance with the manufacturer requirements. • Engine operating hours for emergency and non-emergency operation.

6.3 National Emission Standards for Hazardous Air Pollutants (NESHAP)

6.3.1 40 CFR 63 Subpart ZZZZ - NESHAP for Stationary Reciprocating Internal Combustion Engines

The Mission South Mill Stationary Emergency Generator (SMEME- GEN) is subject to applicable emission limits under the NSPS at 40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. A summary of the applicable emission limits under 40 CFR 60 Subpart ZZZZ is provided in the table below.

Table 14. NESHAP Subpart ZZZZ - Applicable Emission Limits.

Emission Unit	Emission Limit	Operational Limit	Compliance Demonstration
South Mill Stationary Emergency Generator (SMEME-GEN)	None (The engine is only subject to operational limits)	• Change oil and filter every 500 hrs of operation or annually, whichever comes first. • Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary. • Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary. • Maintenance checks and readiness testing - 100 hours. • Non-emergency - 50 hrs (counted towards the 100 hrs for maintenance checks and readiness testing).	• Operation and maintenance of the engines in accordance with the manufacturer requirements. • Engine operating hours for emergency and non-emergency operation.

6.3.2 40 CFR 63 Subpart CCCCCC - NESHAP for Source Category: Gasoline Dispensing Facilities

The existing gasoline dispensing operations is subject to applicable requirements of 40 CFR 63 Subpart CCCCCC - National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities, for a gasoline throughput of less than 10,000 gallon per month. A summary of the applicable requirements and the associated compliance demonstration used by the facility are provided in the table below.

Table 15. NESHAP Subpart CCCCCC - Applicable Requirements.

Emission Unit	Emission Limit	Operational Limit	Compliance Demonstration
Gasoline Dispensing Facility	None	• Minimize gasoline spills. • Clean up spills as expeditiously as practicable. • Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use. • Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices, such as oil/waste separators.	• Implementation of best management practices that incorporate the operational limits. • Monthly gasoline throughput calculated based on a 365-day rolling total.

6.4 Compliance Assurance Monitoring (40 CFR Part 64)

Certain emission points at the Asarco Mission Complex are subject to the requirements of Compliance Assurance Monitoring (CAM) at 40 CFR Part 64. A summary of the emission points subject to CAM, the applicable emission limit, the associated control device, and the CAM monitoring requirements are provided in Table 16 below. Please note that emission points SSOPN-1, SSOPN-2, and SSOPN-3 are currently subject to CAM and form part of the North Circuit that Asarco is requesting PDEQ to remove from the Operating Permit (see Section 5 for the requested revision), and are therefore not included in Table 16.

Table 16. Emission Units Subject to Compliance Assurance Monitoring.

Emission Point	Equipment ID	CAM Plan Number[10]	Applicable Emission Limit	Control Device	Indicators	Indicator Range	Monitoring Requirement
SSOPM-1	303-21	3	$E = 17.31P^{0.16}$ E = the maximum, allowable particulate emission rate in pounds-mass per hour. P = the process weight rate in tons-mass per hour	Wet Scrubber	Differential Pressure	3.7 - 6.9" H_2O	Change in pressure of gas stream through scrubber
					Water Flow	49.6 - 92.2 gpm	Scrubber liquid flow rate
SSOPM-4	307-104	4	PM < 0.05 gram/cubic meter	Wet Scrubber	Differential Pressure	5.2 - 9.6" H2O	Change in pressure of gas stream through scrubber
SSOPM-5	307-105						
SSOPM-6	307-106				Water Flow	50.5 - 93.7 gpm	Scrubber liquid flow rate
SSOPM-7	307-107						
SSOPM-4	307-104	4	PM < 0.05 gram/cubic meter	Proposed Dry Dust Collectors	Differential Pressure	0 - 6" H2O[11]	Change in pressure of gas stream through baghouse
SSOPM-5	307-105						
SSOPM-6	307-106						
SSOPM-7	307-107						
SSOPM-8	311-E37	2	PM < 0.05 gram/cubic meter	Dry Dust Collectors	Differential Pressure	2.4 - 7.8" H2O[12]	Change in pressure of gas stream through baghouse
SSOPM-9	311-E38					0.4 - 3.3" H2O[13]	
SSOPM-10	311-E39					0.4 - 3.3" H2O[14]	
SSOPM-11	311-E40					0.4 - 3.3" H2O[15]	
SSOPM-12	311-E78					0.4 - 3.3" H2O[16]	
SSOPM-13	311-E79					0.4 - 3.3" H2O[17]	
SSOPS-1	10-108	5	$E = 17.31P^{0.16}$ E = the maximum, allowable particulate emission rate in pounds-mass per hour. P = the process weight rate in tons-mass per hour	Dry Dust Collectors	Differential Pressure	0 - 6" H2O	Change in pressure of gas stream through baghouse

[10] CAM Plan Number as referenced from the Operating Permit, Part B Section 10.
[11] Permit Condition Part B, Section 10.VI.B.3.b currently requires an indicator range of 0.5 - 6" H2O, to be further revised to +/-30% of the differential pressure recorded during the most recent stack test. Asarco is requesting to modify the indicator range to 0 - 6"H2O. Please refer to Section 5 of this renewal application.
[12] Indicator range established based on site specific monitoring.
[13] Indicator range established based on most recent performance test.
[14] Indicator range established based on most recent performance test.
[15] Indicator range established based on most recent performance test.
[16] Indicator range established based on most recent performance test.
[17] Indicator range established based on most recent performance test.

Emission Point	Equipment ID	CAM Plan Number[10]	Applicable Emission Limit	Control Device	Indicators	Indicator Range	Monitoring Requirement
SSOPS-2	10-114	5	$E = 17.31P^{0.16}$ E = the maximum, allowable particulate emission rate in pounds-mass per hour. P = the process weight rate in tons-mass per hour	Wet Scrubber	Differential Pressure	2.45 - 4.55" H2O[18]	Change in pressure of gas stream through scrubber
					Water Flow	8.82 - 16.38" gpm[19]	Scrubber liquid flow rate
SSOPS-3	30-150A/B	6	$E = 17.31P^{0.16}$ E = the maximum, allowable particulate emission rate in pounds-mass per hour. P = the process weight rate in tons-mass per hour	Dry Dust Collectors	Differential Pressure	0 - 6" H2O	Change in pressure of gas stream through baghouse
SSOPS-4	20-256	6	$E = 17.31P^{0.16}$ E = the maximum, allowable particulate emission rate in pounds-mass per hour. P = the process weight rate in tons-mass per hour	Wet Scrubber	Differential Pressure	4.20 - 7.80[20]	Change in pressure of gas stream through scrubber
					Water Flow	14.68 - 27.27[21]	Scrubber liquid flow rate
SSOPS-4A	20-270	6	$E = 17.31P^{0.16}$ E = the maximum, allowable particulate emission rate in pounds-mass per hour. P = the process weight rate in tons-mass per hour	Wet Scrubber	Differential Pressure	4.5 - 8.3[22]	Change in pressure of gas stream through scrubber
					Water Flow	22.4 - 41.6[23]	Scrubber liquid flow rate

[18] Indicator range established based on most recent performance test.
[19] Indicator range established based on most recent performance test.
[20] Indicator range established based on most recent performance test.
[21] Indicator range established based on most recent performance test.
[22] Indicator range established based on most recent performance test.
[23] Indicator range established based on most recent performance test.

6.5 Non-applicable Requirements

PDEQ requirements that are not applicable to the Asarco Mission Complex are provided in Table 17 below. For each requirement, included in the table is the regulatory citation, description of the applicable requirements, and the basis of non-applicability.

Table 17. Non-Applicable PDEQ Requirements.

Regulatory Citation	Requirement	Basis of Non-applicability
17.16.010.C	The owner or operator of any stationary or portable source of air pollution which burns any material, except natural gas, shall keep complete records of the materials used as fuel. The owner or operator of any stationary or portable source of air pollution which incinerates any material shall keep complete records of all materials incinerated.	Combustion equipment at the facility only combusts natural gas or propane. The facility does not incinerate any material.
17.16.010.D	Any facility described in Section 17.16.010C utilizing any fuel source or incinerating any material which the operator has any cause to believe may be a hazardous waste shall test such material to determine if the material is a hazardous waste prior to burning or incinerating the material. If the material is a hazardous waste, the facility shall comply with Section 17.16.150.	Combustion equipment at the facility only combusts natural gas or propane. The facility does not incinerate any material.
17.16.070	Fugitive dust emissions standards for motor vehicle operation.	The facility does not have a vacant lot, an urban or suburban open area, or a dry wash, riverbed, or open area subject to this provision.
17.16.080	Vacant lots and open spaces.	The facility does not have a vacant lot, or open spaces subject to this provision.
17.16.090(A)-(C), (F)	Roads and streets.	The facility does not have roads and streets subject to these provisions.
17.16.150	Combustion of Hazardous waste, hazardous waste fuel, used oil, and used oil fuel burning equipment.	The facility does not combust hazardous waste, hazardous waste fuel, used oil, and used oil fuel burning equipment.

Regulatory Citation	Requirement	Basis of Non-applicability
17.16.160	Standards of performance for fossil-fuel fired steam generators and general fuel burning equipment.	The facility does not operate any fossil-fuel fired steam generators and general fuel burning equipment subject to the requirements of this regulation. Please note that the facility does operate small combustion equipment (hot water heaters) that has been previously granted insignificant status by PDEQ. A list of this small combustion equipment is provided in Section 7.
17.16.165	Standards of performance for fossil-fuel fired industrial and commercial equipment.	The facility does not operate any fossil-fuel fired industrial and commercial equipment subject to the requirements of this regulation. Please note that the facility does operate small combustion equipment (hot water heaters) that has been previously granted insignificant status by PDEQ. A list of this small combustion equipment is provided in Section 7.
17.16.170	Incinerators.	The facility has not installed and does not operate any incinerators onsite.
17.16.210	Standards of performance for asphalt concrete plants.	The facility has not installed and does not operate onsite an asphalt concrete plant.
17.16.230(A)	Standards of performance for storage vessels for petroleum liquids.	The facility does not have any petroleum liquid storage vessels of the minimum capacity storing liquids with a vapor pressure of 1.5 pounds per square inch absolute or greater under actual storage conditions.
17.16.230(C)	Dock loading of petroleum products.	The facility does not have a dock loading operation.
17.16.240 through 17.16.350	Standards of Performance for emission units.	The facility does not have any of the emission units regulated by these provisions.
17.16.350	Standards of performance for lime manufacturing plants.	The facility does not manufacture lime.
17.16.370	Standards of performance for gravel or crushed stone processing plants.	The facility does not operate onsite gravel or crushed stone processing plants.
17.16.380 through 17.16.390	Standards of Performance for emission units.	The facility does not have any of the emission units regulated by these provisions.

Regulatory Citation	Requirement	Basis of Non-applicability
17.16.400	Organic solvents and other organic materials	The facility is subject to the requirements of Section 17.16.230, as applicable to the onsite gasoline storage and dispensing, and is therefore exempt from this requirement in accordance with 17.16.400.D.
17.16.410 through 17.16.420	Standards of Performance for emission units.	The facility does not have any of the emission units regulated by these provisions.
17.16.430	Standards of performance for unclassified sources.	The facility does not operate any emission unit that is not otherwise subject to standards of performance under Articles IV, VI, or VII of Chapter 17.16.
17.16.450 through 17.16.480	Emissions from New and Existing Portable Sources.	The facility does not operate any new or existing portable sources subject to these provisions.
17.16.490 (except 17.16.490.A.46)	Incorporation of federal New Source Performance Standards	The facility does not operate any emission units regulated by these federal provisions.
17.16.500 through 17.16.510	Standards of performance for fossil-fuel fired steam generators and incinerators.	The facility does not operate any fossil-fuel fired steam generators and incinerators.
17.16.520(2)	Standards of performance for storage vessels for petroleum liquids.	The facility does not operate any emission units regulated under this standard.
17.16.530.A	National Emissions Standards for Hazardous Air Pollutants (NESHAP).	The facility does not operate any emission units regulated by these federal provisions.
17.16.530.B (except 17.16.530.B.108)	National Emissions Standards for Hazardous Air Pollutants (NESHAP).	The facility is not a major source of hazardous air pollutants. ASARCO does not operate any emission units governed by federal provisions regulating area sources.
17.16.650 through 17.16.685, Article IX	Emissions of Hazardous Air Pollutants (HAPS).	The facility is not a listed source category in Table 2 in Article IX.

7 Exemptions and Insignificant Activities

A list of activities considered insignificant at the site the associated regulatory citation is provided below.

7.1 Landscaping, Building Maintenance, or Janitorial Activities

The following activities are performed at the Mission Complex and are considered insignificant in accordance with PCC 17.04.340.A.114(a).

(1). Landscaping

a) Landscaping and site housekeeping equipment;

b) Fugitive emissions from landscaping activities;

c) Use of pesticides, fumigants, and herbicides;

d) Grounds keeping activities and products; and

e) Internal combustion engines used for landscaping purposes.

(2). Building Maintenance

a) Housekeeping activities and associated products used for cleaning purposes, including collecting spilled and accumulated materials at the source, including operations of fixed vacuum cleaning systems specifically for such purposes;

b) Air conditioning, cooling, heating, or ventilating equipment not designed to remove air contaminants generated by or released from associated or other equipment;

c) General office activities, such as paper shredding, copying, photographic activities, and blueprinting;

d) Consumer use of paper trimmers/binders;

e) Rest room facilities and associated cleanup operations, and stacks or vents used to prevent the escape of sewer gases through plumbing traps;

f) Smoking rooms and areas;

g) Use of consumer products, including hazardous substances as that term is defined in the Federal Hazardous Substances Act (15 U.S.C. 1261 et. seq.) where the product is used at a source in the same manner as normal consumer use;

h) Vacuum cleaning systems where the system is used exclusively for industrial or commercial purposes;

i) Laundry activities, except for dry-cleaning and steam boilers; and

j) Janitorial Activities.

7.2 Gasoline Storage Tanks

The following activities are performed at the Mission Complex and are considered insignificant in accordance with PCC 17.04.340.A.114(b).

(1). One 1,000 gallon gasoline storage tank located at the South Mill

7.3 Diesel and Fuel Oil Storage Tanks

The following activities are performed at the Mission Complex and are considered insignificant in accordance with PCC 17.04.340.A.114(c).

(1). Storage Tanks-Diesel: 3 tanks, 20,000 gallons each, General area

(2). Storage Tank-Fuel Oil, 1 tank, 6,000 gallons, Above Ground, Mission Mill Area

(3). Storage Tank-Fuel Oil Emulsion, 1 tank, 6,000 gallons, Above Ground, Mission Mill Area

7.4 Batch Mixers

Operations at the Mission Complex operate batch mixers that are considered insignificant activities in accordance with PCC 17.04.340.A.114(d).

7.5 Hand-held or Manually Operated Equipment

Operations at the Mission Complex use hand-held or manually operated equipment to support onsite activities and operations that are considered insignificant activities in accordance with PCC 17.04.340.A.114(f).

7.6 Internal Combustion (IC) Engine-driven Compressors, Generators, Pumps

The following activities are performed at the Mission Complex and are considered insignificant in accordance with PCC 17.04.340.A.114(h).

(1). Internal combustion engine driven electrical generators.

a) Detroit Diesel Power Generator (equip. #23-001)

b) Detroit Diesel Power Generator (equip. #23-002)

c) Detroit Diesel Power Generator (equip. #23-003)

(2). Internal combustion engine driven compressors, generators, welders, light plants, sump pumps, and compactors used at various operating divisions including, but not limited to, the Mechanical Department, Electrical Department, Metallurgical Department, Mill Operations Departments, Mine Department, Engineering Department, and the Environmental Department.

(3). Portable electrical generators that can be moved by hand from one location to another.

7.7 Lab Equipment

The following activities are performed at the Mission Complex and are considered insignificant in accordance with PCC 17.04.340.A.114(i).

(1). Analytical and experimental laboratory equipment that is bench scale in nature used for mineral evaluations and research and development including chemical and physical analysis, quality control/quality assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.

(2). Small pilot scale research and development projects (per A.A.C. R18-2-101.54) that include but are not limited to:

a) The testing of water mist/spray controls for dust abatement;

b) The testing of roadway surface treatment coating for dust abatement;

c) Research involving alternate product forms; and

d) Geologic and hydrogeological exploration and drilling activities.

(3). Two wet scrubbers control the lab fume exhaust from the Metallurgical Laboratory. Impinjet Wet Scrubbers, W.W. Sly Mfg. Co., #JW4994A and JW4995.

(4). Routine calibration and maintenance of laboratory equipment or other analytical instruments.

(5). Hydraulic and hydrostatic testing equipment.

(6). Environmental chambers not using hazardous air pollutant (HAP) gasses.

7.8 Size Based Exemptions

The following activities are performed at the Mission Complex and are considered insignificant in accordance with PCC 17.04.340.A.114(j).

The following combustion equipment has been deemed insignificant in the past permit applications.

Table 18. Insignificant Combustion Equipment.

Description	Fuel	Number of Units	Rated Capacity
Space Heaters	Natural Gas/Propane	66	100,000 - 350,000 Btu/hr
Hot Water Heater	Natural Gas/Propane	Various	20,000 - 435,000 Btu/hr

7.9 Storage and Distribution

Asarco has on-site the following storage tanks that the Control Officer determined were insignificant activities in Asarco's previous permit application:

(1). Chemical Storage and Process Holding Tanks that are not Otherwise Covered under Section 112 of the Clean Air Act.

a) Chemical storage tanks and storage areas:
- Ammonium Nitrate Storage Silos located at the Mission Mill area
- Ammonium Nitrate Storage Silos located at the South Mill area.

b) Storage tanks listed in the table below

Table 19. Chemical Storage and Process Holding Tanks

Tank Name/Number	Installation Date	Chemical	Capacity
N-1	approx. 1960	MIBC	16,000
N-2	approx. 1960	Sodium Hydrosulfide	10,000
N-3	approx. 1960	Sodium Hydrosulfide	10,000
N-4	approx. 1960	Sodium Silicate	15,500
N-5	Vendors tank	Xanthate Blend	7,800
N-6	Vendors tank	AERO 4037	8,500
N-7	Vendors tank	Cytec- AD-100	8,400
N-8	approx. 1960	Sodium Hydrosulfide	10,000
N-9	approx. 1960	Pine Oil	17,000
N-10	approx. 1960	Pine Oil	3,300
N-11	approx. 1991	C-530 (Phosphonate Terpolymer)	4,500
N-12	approx. 1960	"Milk of Lime"	80,000
N-13	approx. 1960	"Milk of Lime"	80,000
S-1	approx. 1991	MIBC	8,400
S-2	approx. 1991	Pine Oil	10,000
S-3	approx. 1991	Aerodri-104	7,000
S-4	approx. 1991	Cytec 4037	7,000
S-5	1972(N. Tank)	"Milk of Lime"	34,000
S-6	1991(S. Tank)	"Milk of Lime"	56,800
S-7	approx. 1991	Cyanamid	8,000
S-8	approx. 1991	Liquid Xanthate	8,000
n/a	n/a	C-531	n/a
n/a	n/a	C-586	n/a
n/a	n/a	Calfoam EA-603	55 gal/drum
Tripper Deck			
1	1961	Collector	950
2	1961	2-6 mix Collector	950

Tank Name/Number	Installation Date	Chemical	Capacity
3	1961	Pine Oil Emulsion	950
4	1961	Fuel Oil	950
5	1961	Cytec 4037	70
Mission Concentrator Reagent Building			
1	1961	MIBC	1,000
2	1961	MIBC	500
3	1961	MIBC	500
4	1961	Pine Oil	1,300
5	1961	Pine Oil	20,000
6	1961	Aeroflo-Xanthate	3,500
7	1961	Cytec 4037	3,500
8	1961	MIBC	3,800
South Mill Reagent Building			
1	1991	Oroprep	2,300
2	1991	Pine Oil	2,300
3	1991	Xanthate	2,300
4	1991	Testing	1,600
5	1991	Cytec 4037	2,300
6	1991	F145LV	3,800
Blasting			
N/A	1963	(2) Ammonium Nitrate (North)	70 tons each
N/A	1972	(2) Ammonium Nitrate (South)	55 tons each

(2). Storage of butane, propane, or liquefied petroleum gas less than 100 gallon.

(3). Petroleum product storage tanks containing the following substances:

a) Lubricating oil and Transformer oil:

- Bulk Oil Tank, 3 tanks, 10,000 gallons each, Above Ground Tanks, Lube Center area
- Bulk Oil Tank, 1 tank, 1,000 gallons, Above Ground Multi-purpose tank, Underground mine area
- Bulk Oil Tank, 1 tank, 500 gallons, Above Ground Multi-purpose tank, Underground mine area

b) Used oil:

- Used Oil Tank, 4 tanks, 5,000 gallons each, Above Ground Tanks, South Mill, Truck Shop, Mission Mill areas
- Used Oil Tank, 1 tank, 10,000 gallons, Lube Center area
- Used Oil Tank, 1 tank, 1,500 gallons, Above Ground Multi-purpose tank, Underground mine area

(4). Piping and storage systems for natural gas, propane, and liquefied petroleum gas.

(5). Piping of fuel oils, used oil, and transformer oil.

(6). Storage and handling of drums or other transportable containers where the containers are sealed during storage, and covered during loading and unloading (includes containers of RCRA waste and used oil).

(7). Mission Complex drum staging and identification area. Varying quantities of drums containing mainly Non-Hazardous wastes with minor amounts of RCRA Wastes.

(8). Storage tanks of any size containing exclusively soaps, detergents, waxes, greases, aqueous salt solutions, aqueous acid solutions, or aqueous caustic solutions.

a) Liquid Soap storage tanks located at the wash pad area
b) Grease tanks located at the Lube Center
c) Solvent storage (dispensing equipment) with capacity of 10,000 gallons or less:
   - Storage Tank- 140 Flash Solvent; Above Ground Tank, 2,500 gallons, Lube Center area
   - Solvent Degreasing Units (140 Flash Solvent cleaning tanks used in various work areas.); 30-60 gallons each

7.10 Used Oil Collection and Recycling

Water and Wastewater Treatment (excluding remediation projects and sewage treatment plants subject to 40 CFR 60 Subpart O. In Asarco's previous permit application, the Control Officer determined the following activities were insignificant because of their size:

(1). Water treatment or storage or cooling systems for process liquids and gases containing no chromium water treatment compounds;

(2). Chemical storage associated with water and wastewater treatment where the water is treated for consumption and/or use within the permitted facility;

(3). The collection, transmission, liquid treatment, and solids treatment processes at domestic type wastewater and sewage treatment works, or treatment facilities, including septic tank systems, which treat only domestic type wastewater and sewage;

(4). Demineralized water tanks and demineralizer vents; and

(5). Process water filtration systems and demineralizers.

7.11 Burning Activities

In Asarco's previous permit application, the Control Officer determined the following activities were insignificant because of their size:

(1). Firefighting activities and training conducted at the source in preparation for fighting fires (All reporting and permitting requirements that apply to such operations must be followed);

(2). Open burning activities (All reporting and permitting requirements that apply to such operations must be followed); and

(3). Flares used to indicate danger (emergency road flares).

7.12 Roadways

In Asarco's previous permit application, the Control Officer determined the following activities were insignificant because of their size:

(1). Activities associated with the construction, repair, or maintenance of roads or other paved or open areas, including operation of street sweepers, vacuum trucks, spray trucks, and other vehicles related to the control of fugitive emissions of such roads or other areas;

(2). Unpaved public and private roadways, except for haul roads located within a stationary source site boundary;

(3). Road and lot paving operations at commercial and industrial facilities;

(4). Street and parking lot striping; and

(5). Fugitive dust emissions from the operation of a passenger automobile, station wagon, pickup truck, or van at a stationary source.

7.13 Proposed Insignificant Activities

7.13.1 Touch N Seal Usage

The Mission Complex uses Touch N Seal foam to support railcar loading activities. The facility uses an estimated average of about 15 boxes of Touch N Seal foam. Estimated VOC and HAP (MDI, 1% of VOC) from the usage of the Touch N Seal foam is as follows:

- Annual estimated usage - 15 boxes
- Weight per box - 50 lb.
- Total Usage Weight - 750 lb
- VOC Content - 1%
- Annual VOC Emissions - 7.5 lb/yr (or 0.00375 ton/year)

7.13.2 Maintenance Shop Truck Painting

Occasionally Asarco will paint truck beds as part of the routine maintained and upkeep of the equipment. Annually, Asarco could potentially paint one to two trucks. An estimate of the VOC emissions from this maintenance painting operation is provided below.

- Number of trucks painted - 2 trucks
- Quantity of paint per truck - 25 gallon
- Total annual paint usage - 50 gallon

- Specific gravity of paint - 1.14
- Percent VOC in Paint - 20%
- Annual VOC Emissions - 94.62 lb (0.05 ton/year)

With this request for insignificant status, Asarco is also requesting that this occasional truck painting activity be exempt from the requirements of 17.16.400.C.

8 Source Compliance Status

As required by filing instructions 16.b.i, Asarco is stating the Mission Complex will continue to comply with the applicable requirements with which they currently comply and will meet requirements that become effective before or after permit issuance. In accordance with the requirements of Section 13.C of the Operating Permit, Asarco submits an Annual Compliance Certification (ACC) indicating whether the facility has complied with the conditions of the Operating Permit, whether the compliance was continuous or intermittent, and the information used to demonstrate compliance. The ACC is submitted to PDEQ annually, prior to March 31.

Figures

Figure 1 - Asarco Mission Complex - Site Location Map

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

Figure 2 - Asarco Mission Complex - Site Location Map

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

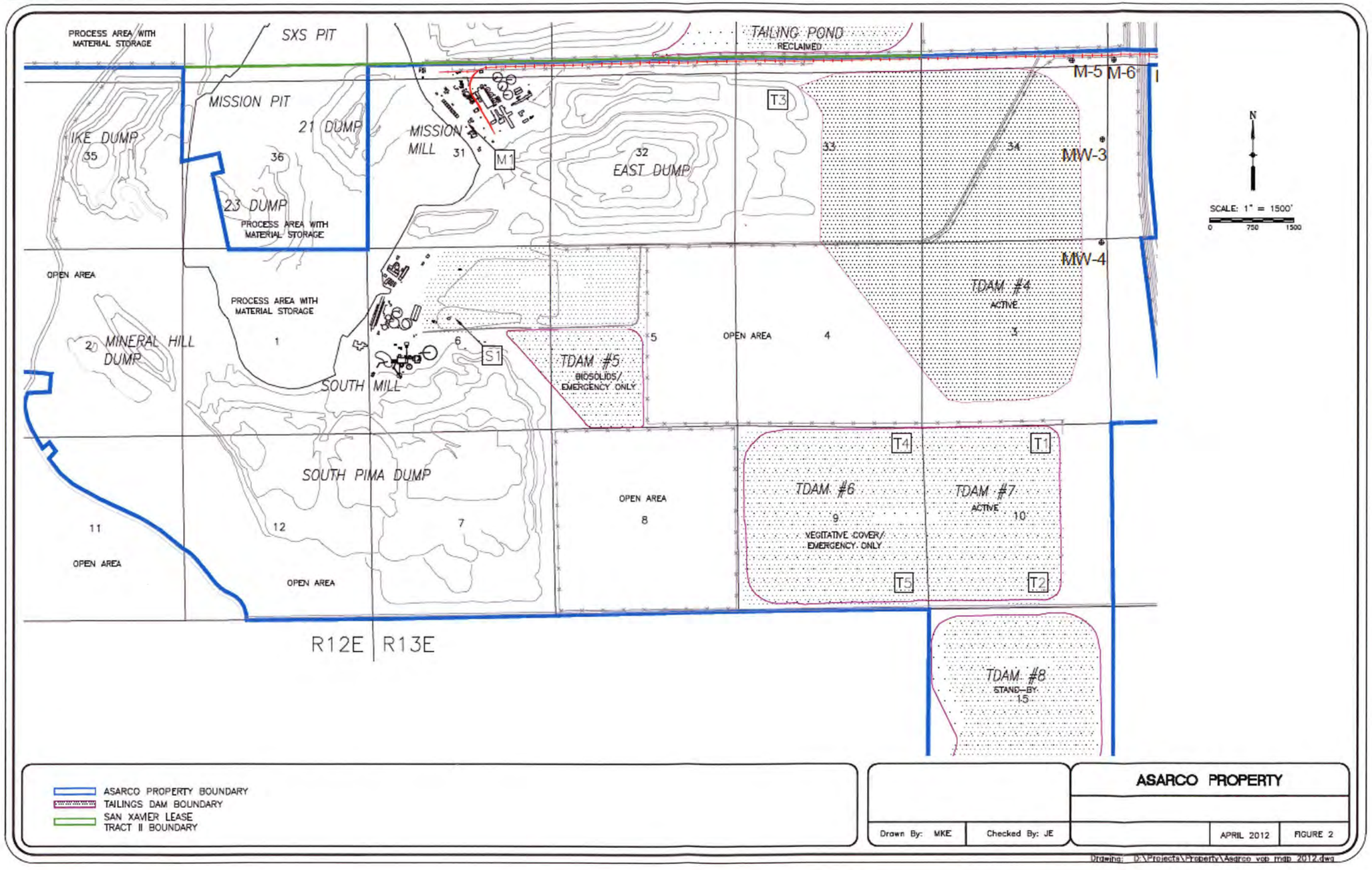


Figure 3 - Asarco Property

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222
Project No: 0407567

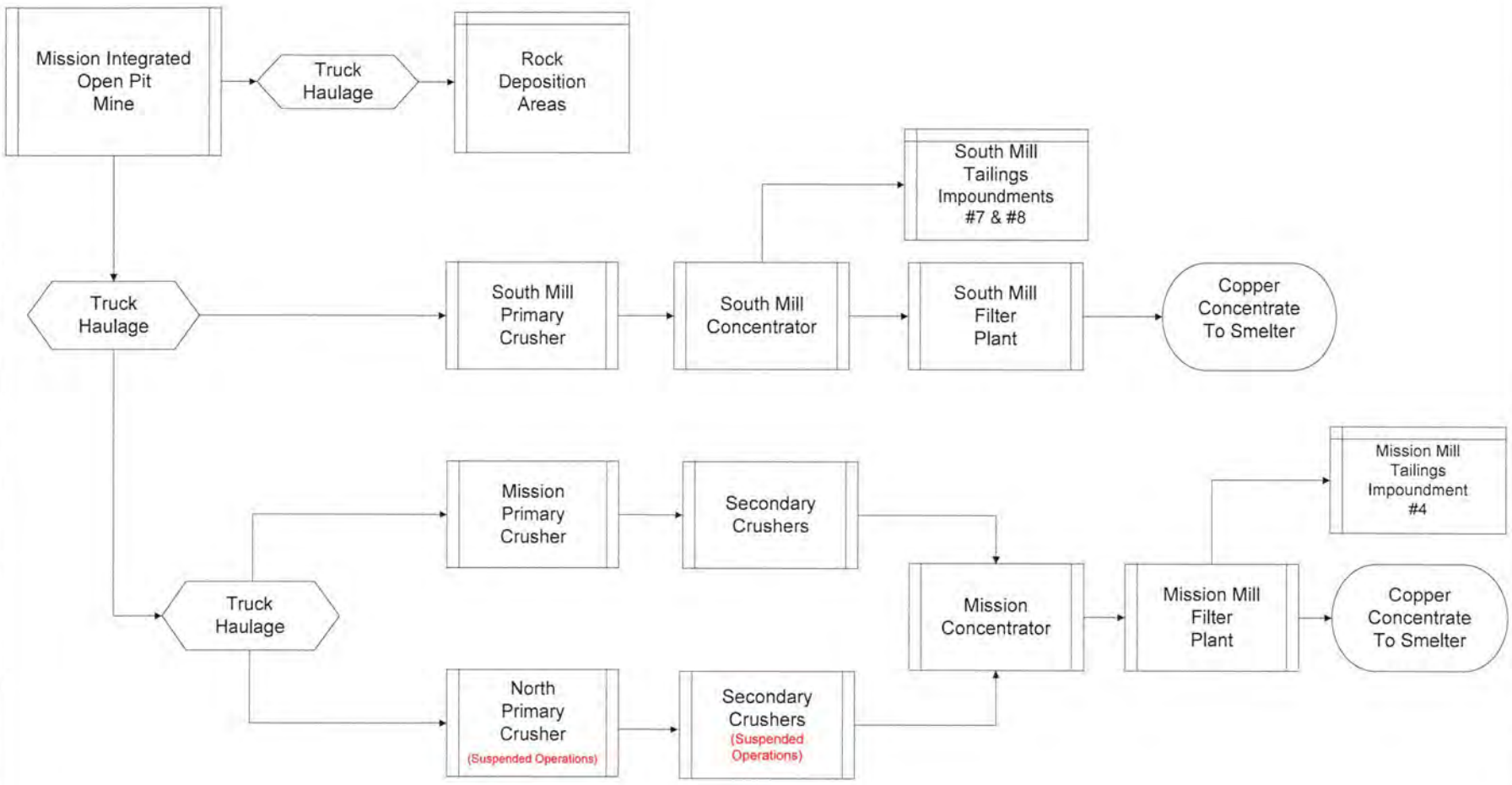


Figure 4 - Asarco Mission Complex - Overview Process Flow

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

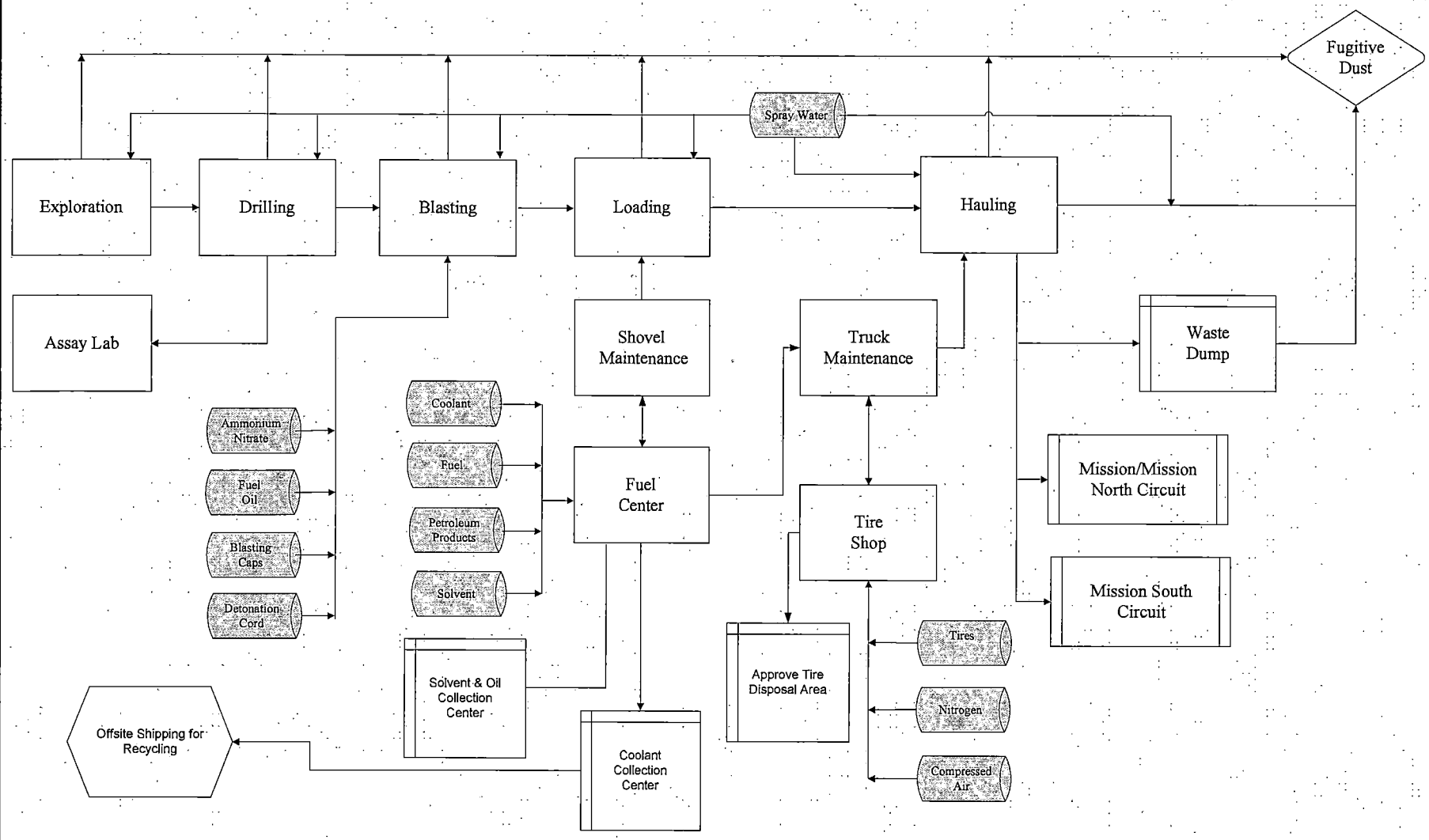


Figure 5 - Asarco Mission Complex - Mining

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

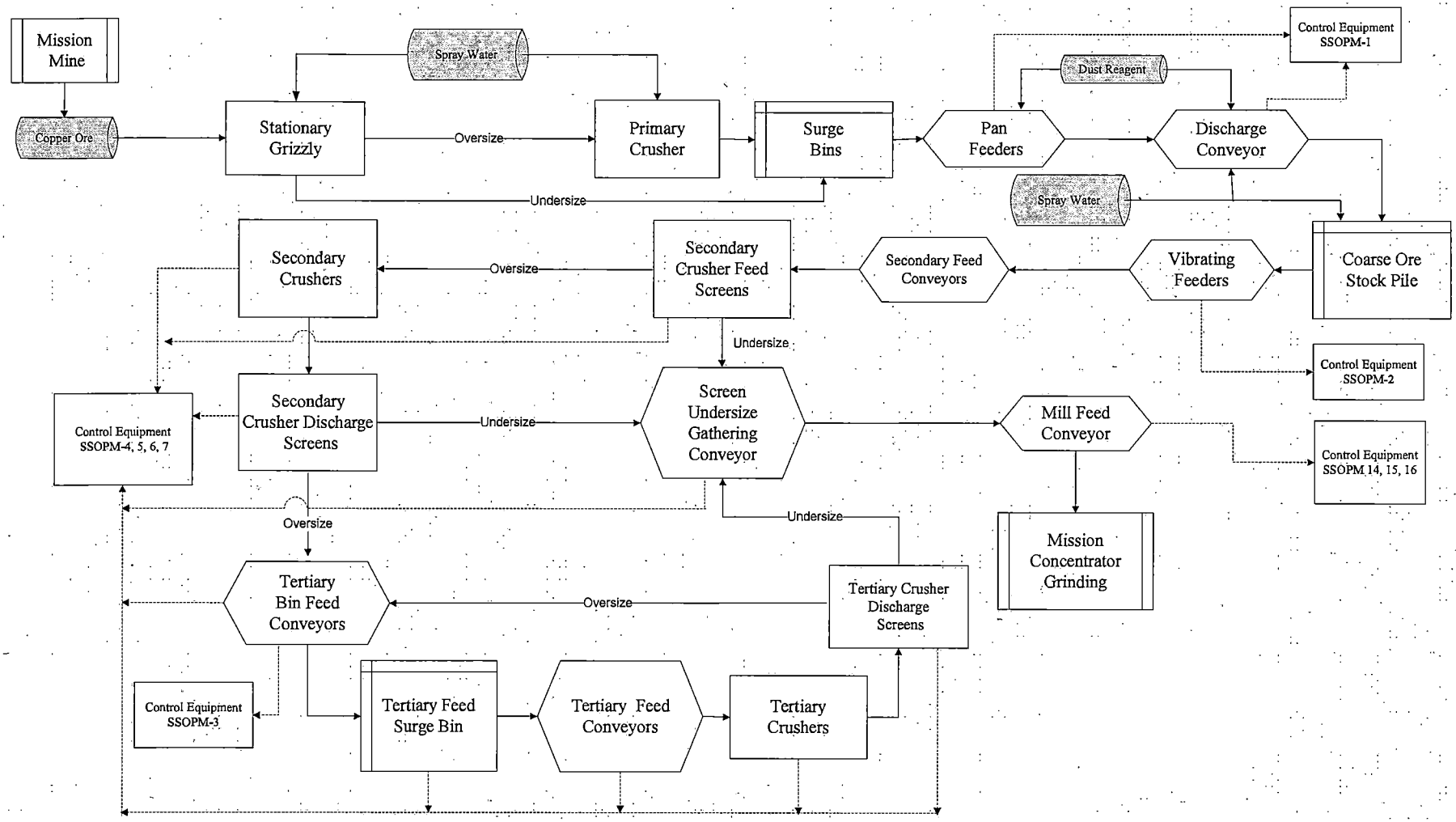


Figure 6 - Mission Circuit

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

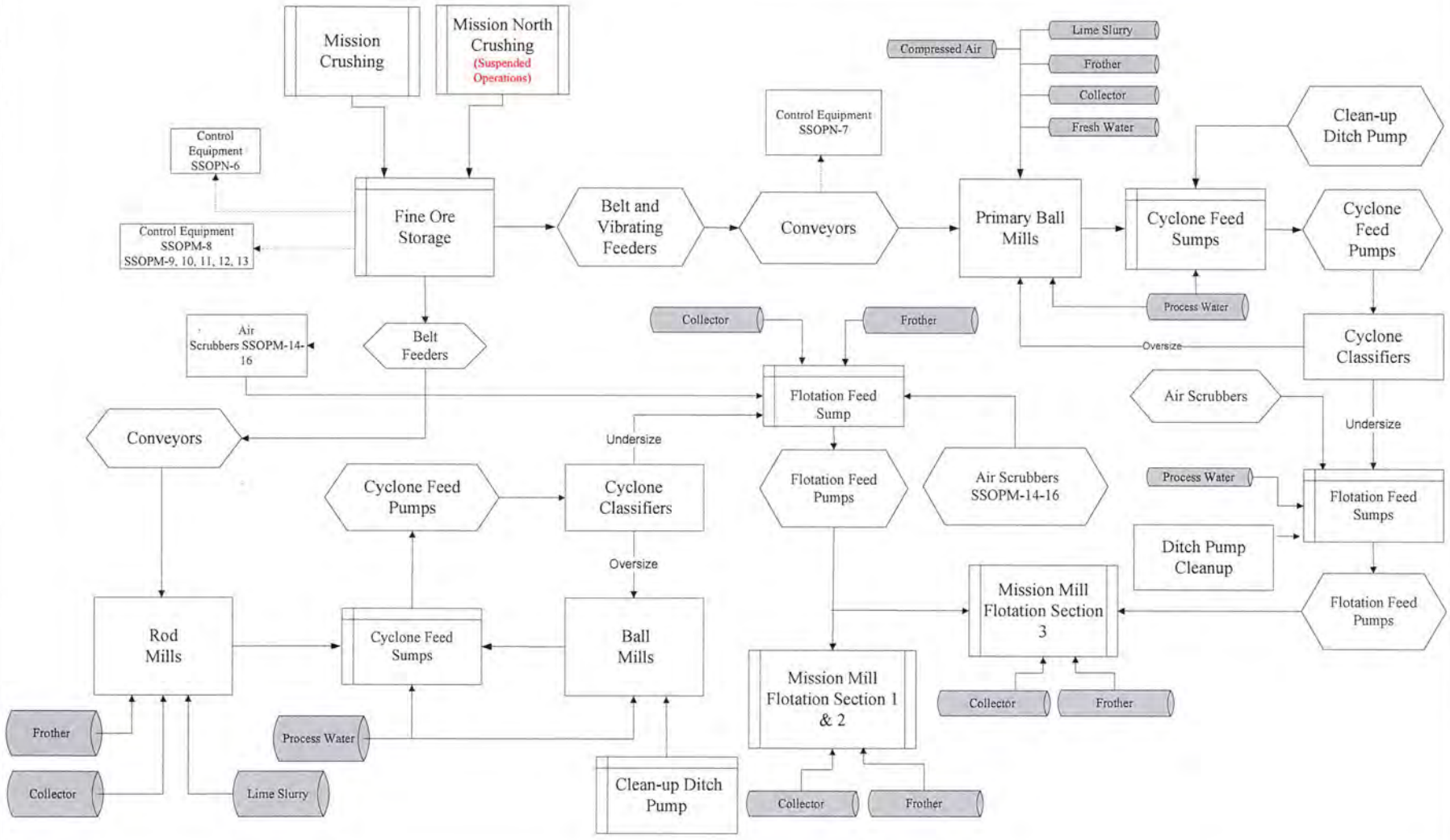


Figure 7 - Mission Concentrator

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

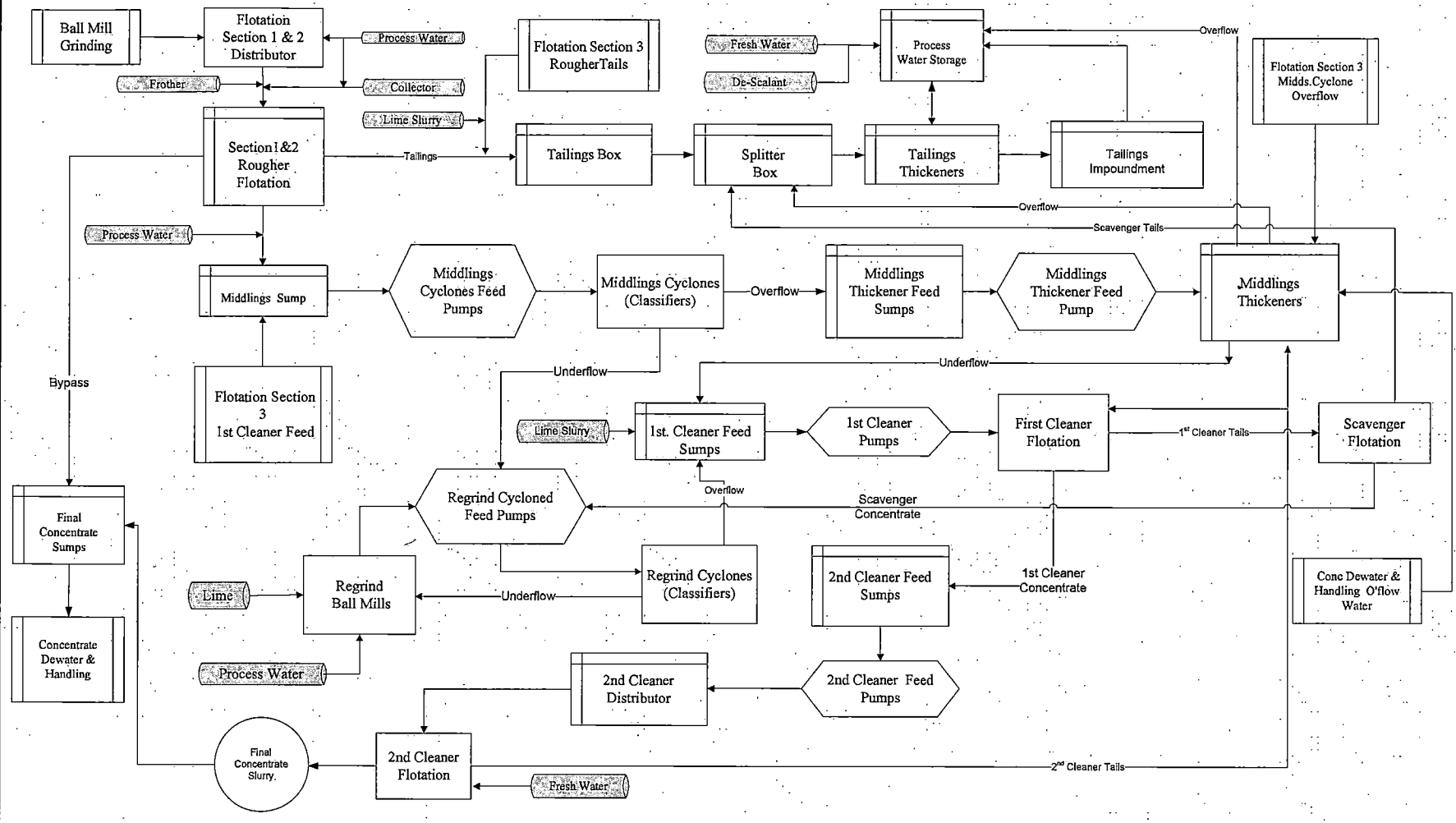


Figure 8 - Mission Concentrator - Section 1 and 2

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

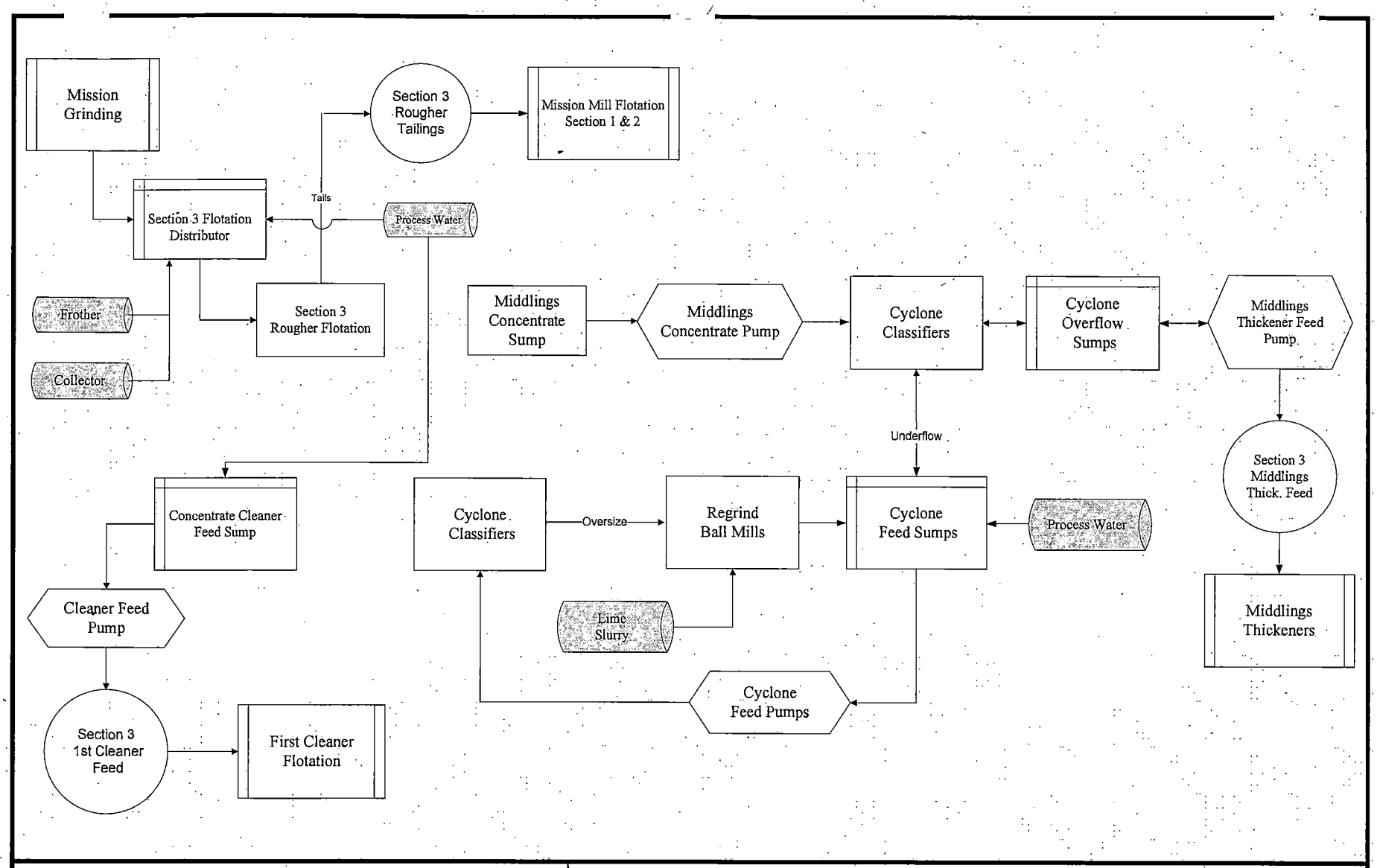


Figure 9 - Mission Concentrator - Section 3

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

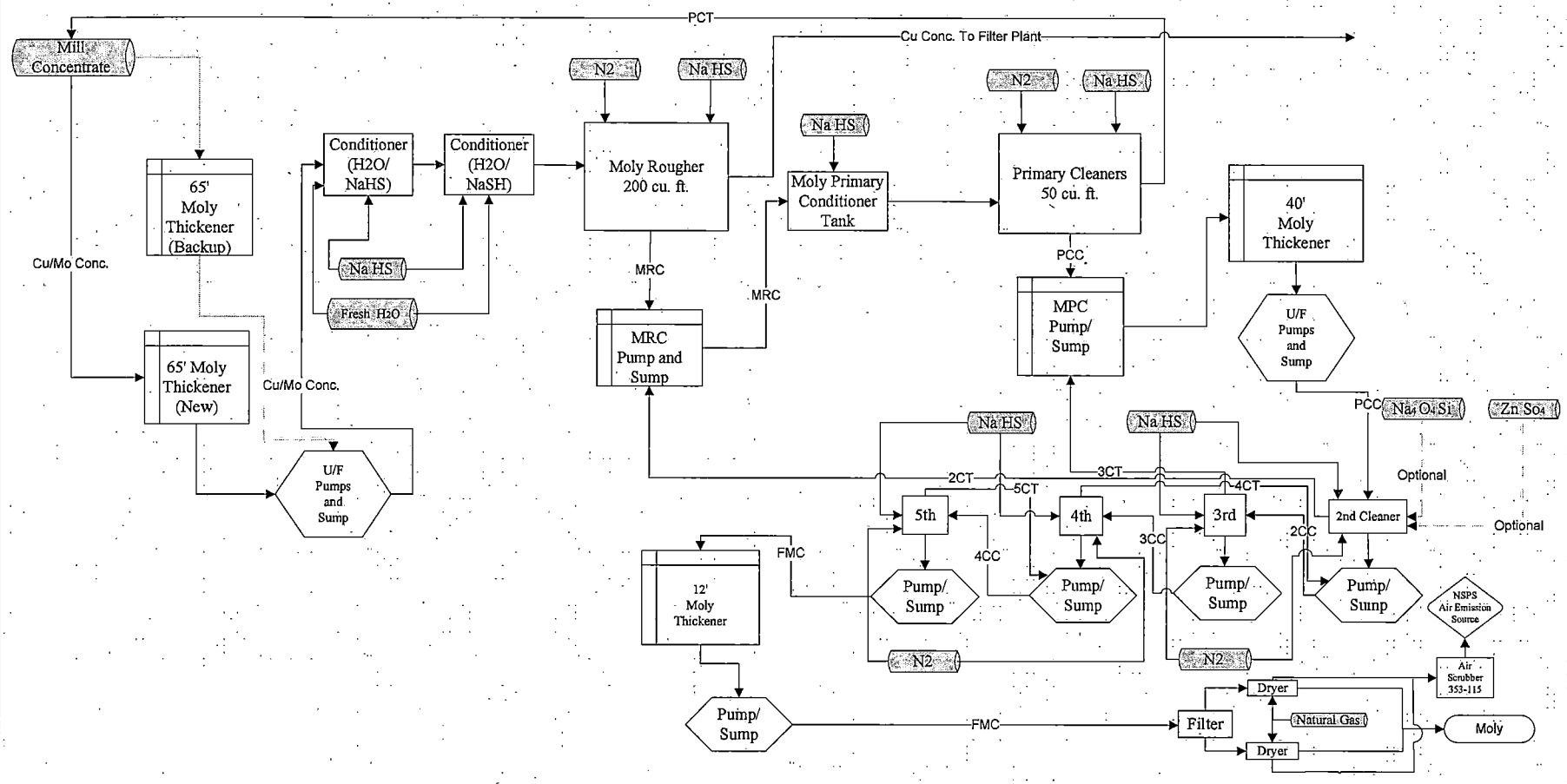


Figure 10 - Moly By-products Circuit

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

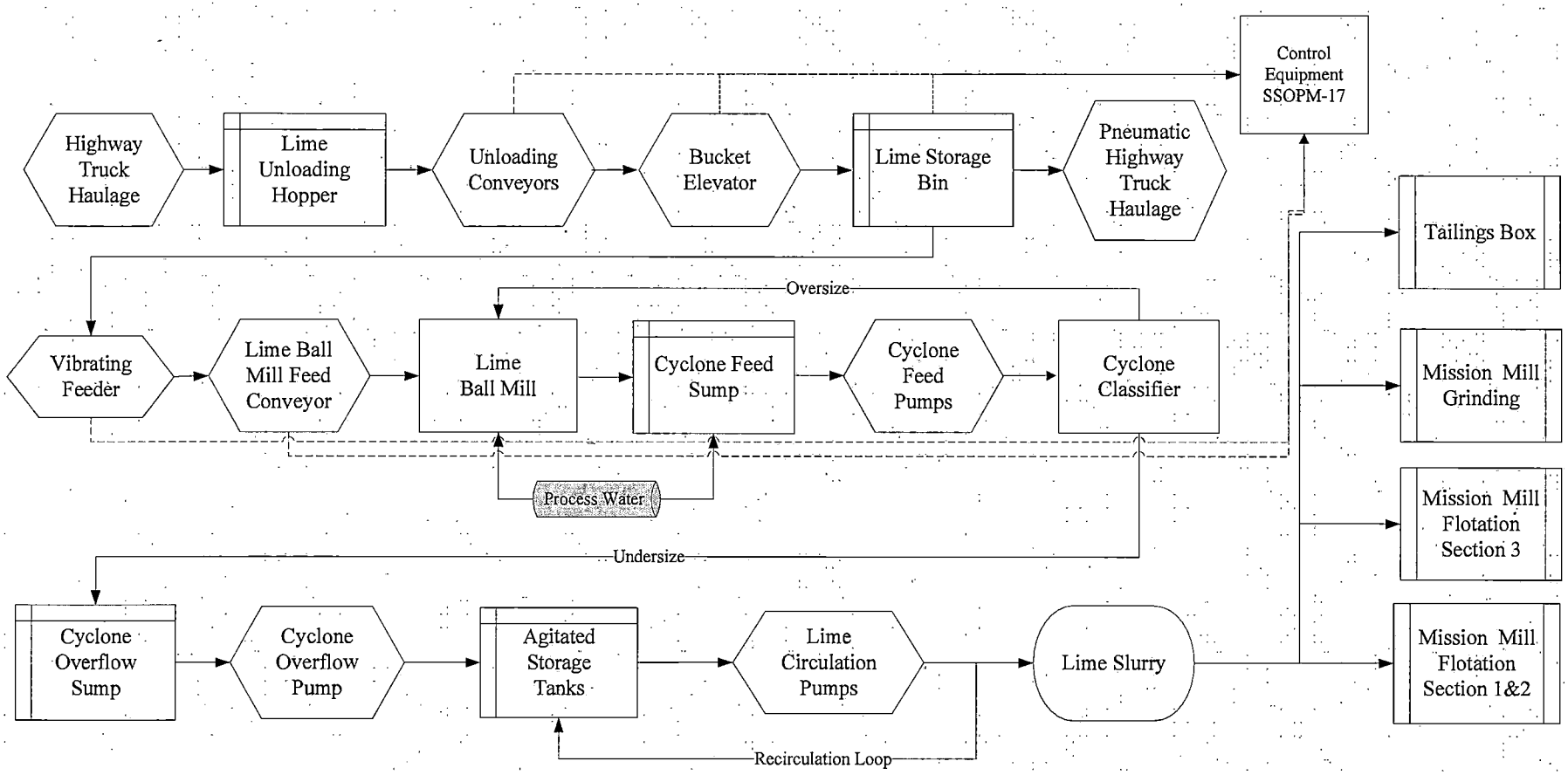


Figure 11 - Moly By-products Circuit

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

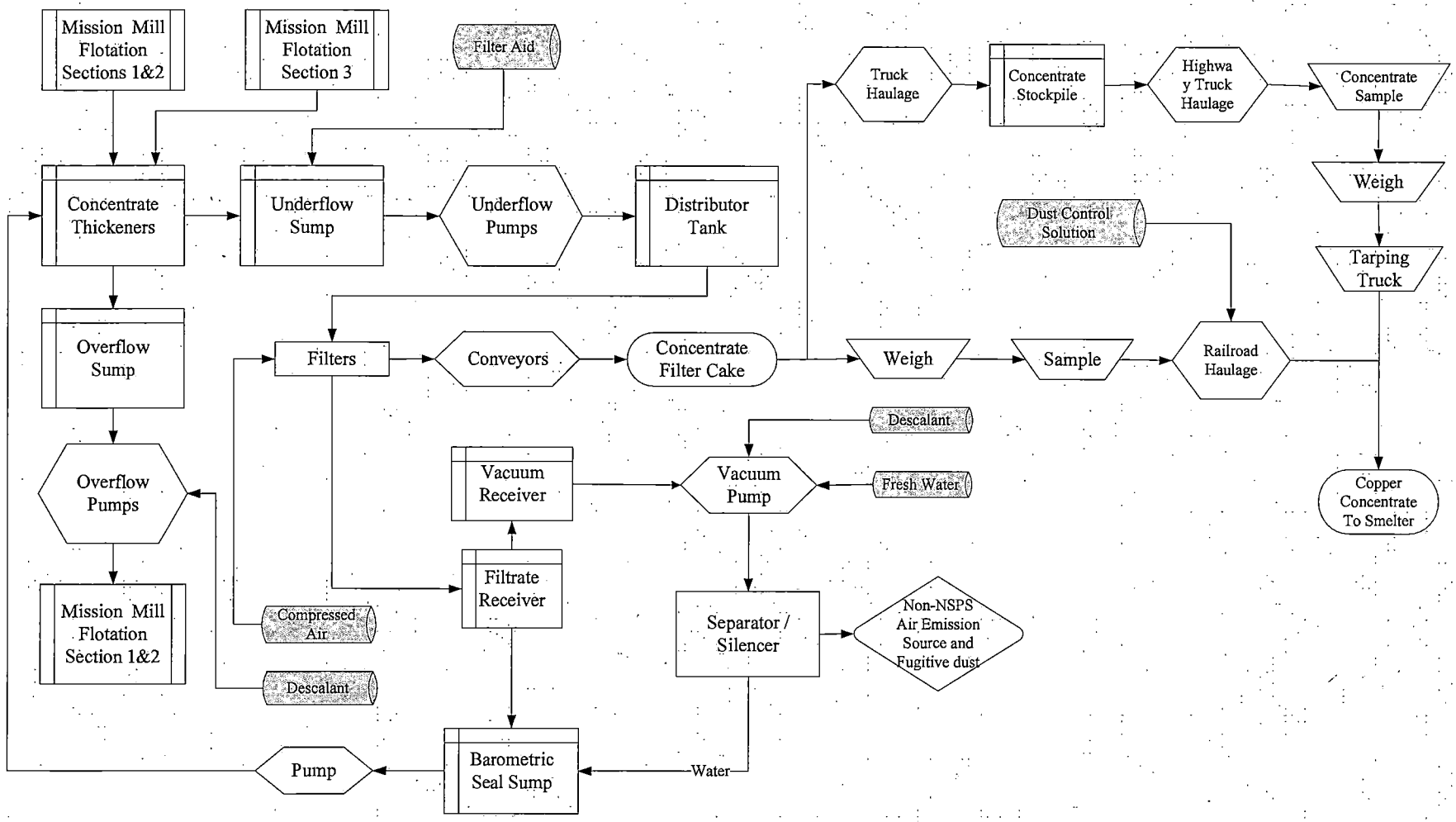


Figure 12 - Mission Concentrate Dewatering

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

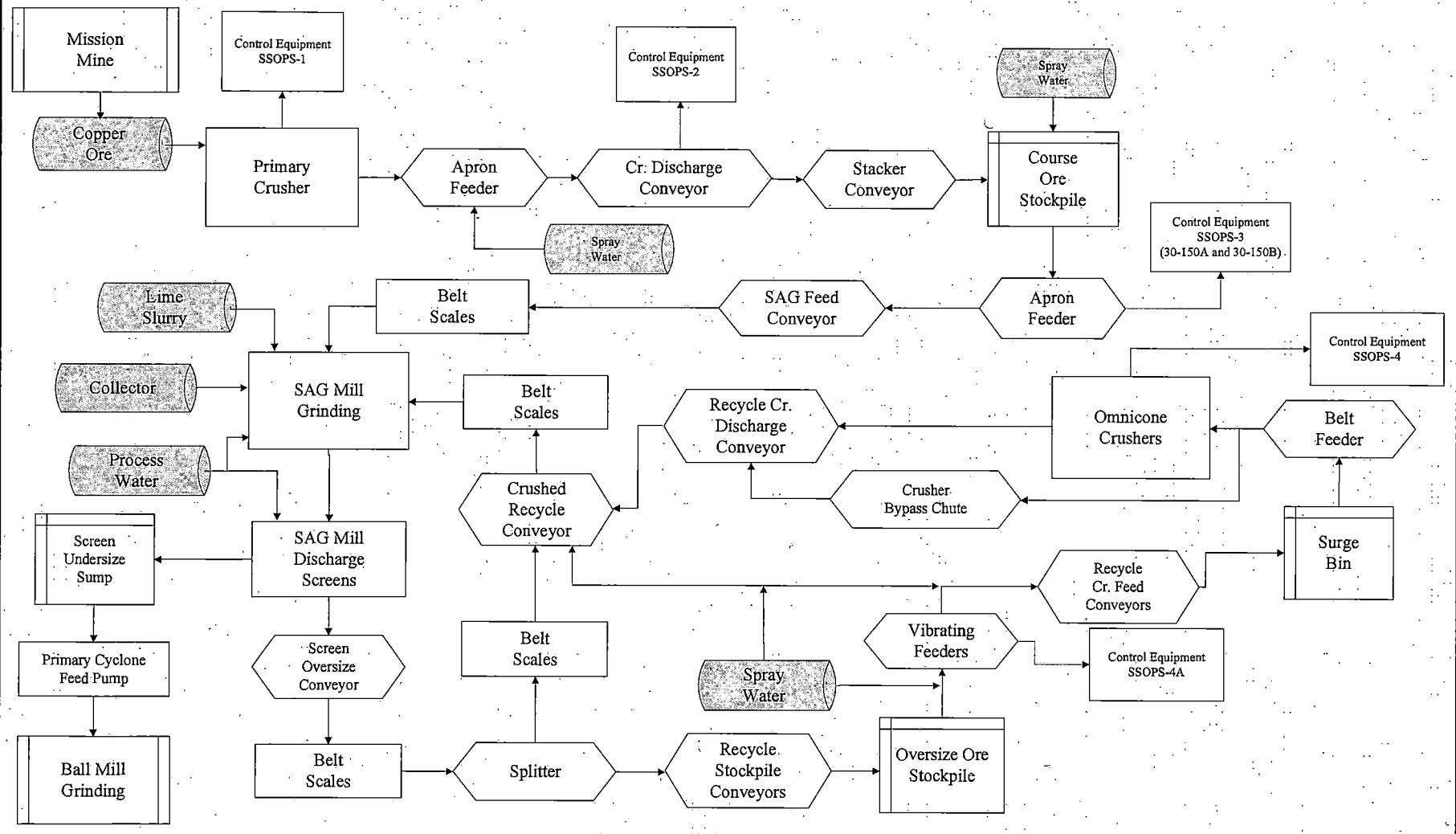


Figure 13 - South Circuit

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

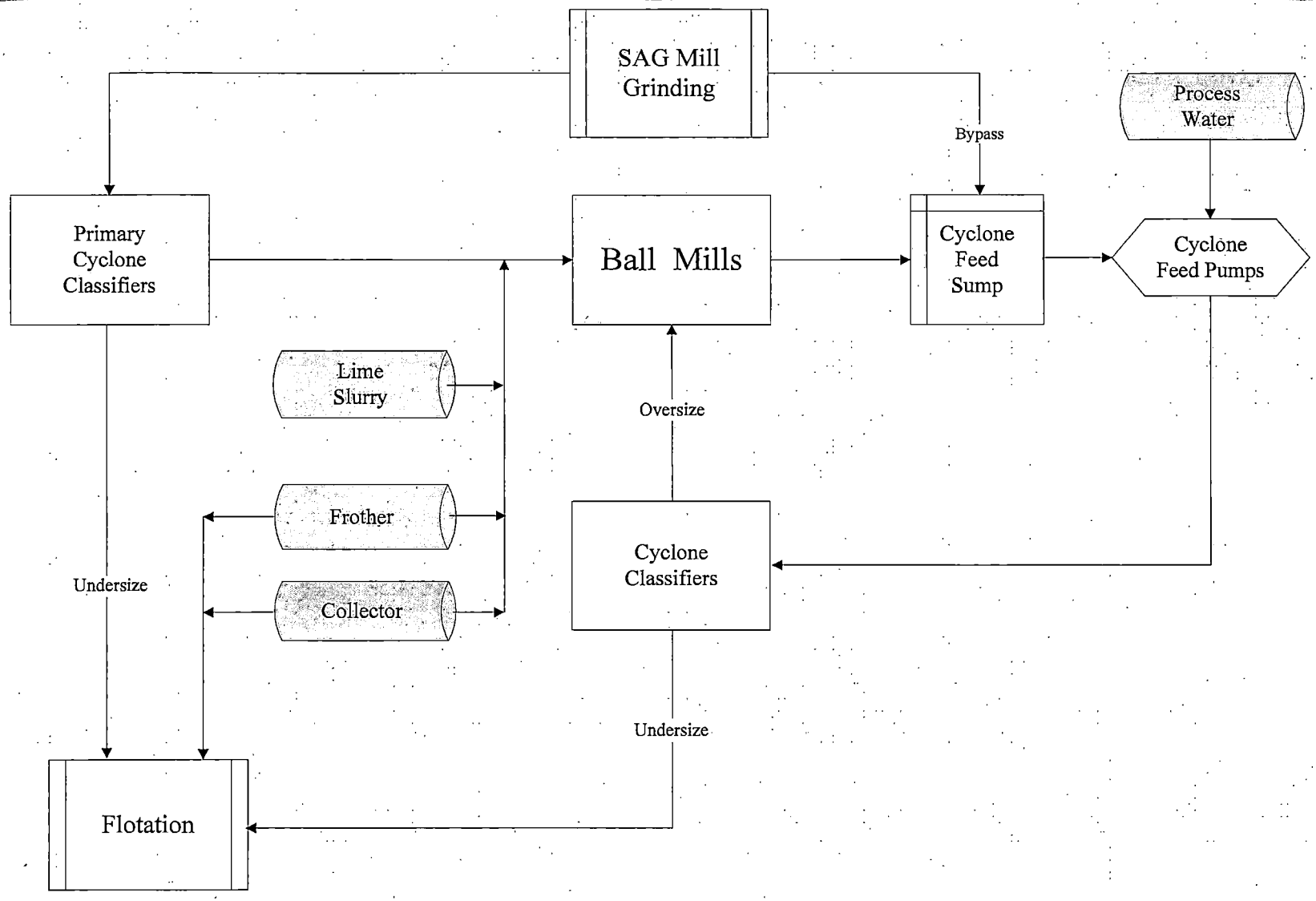


Figure 14 - South Grinding Circuit

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

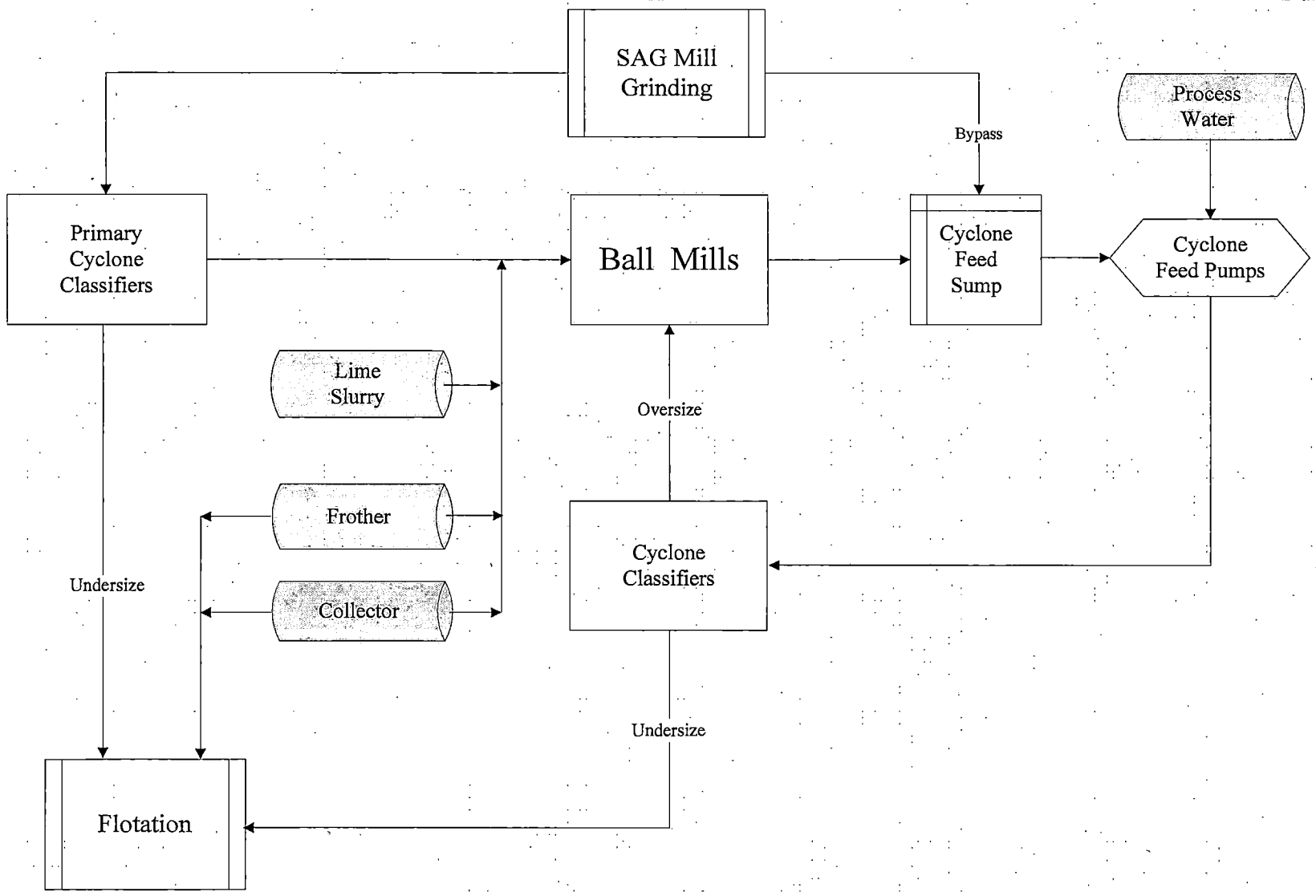


Figure 15 - South Floatation Circuit

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

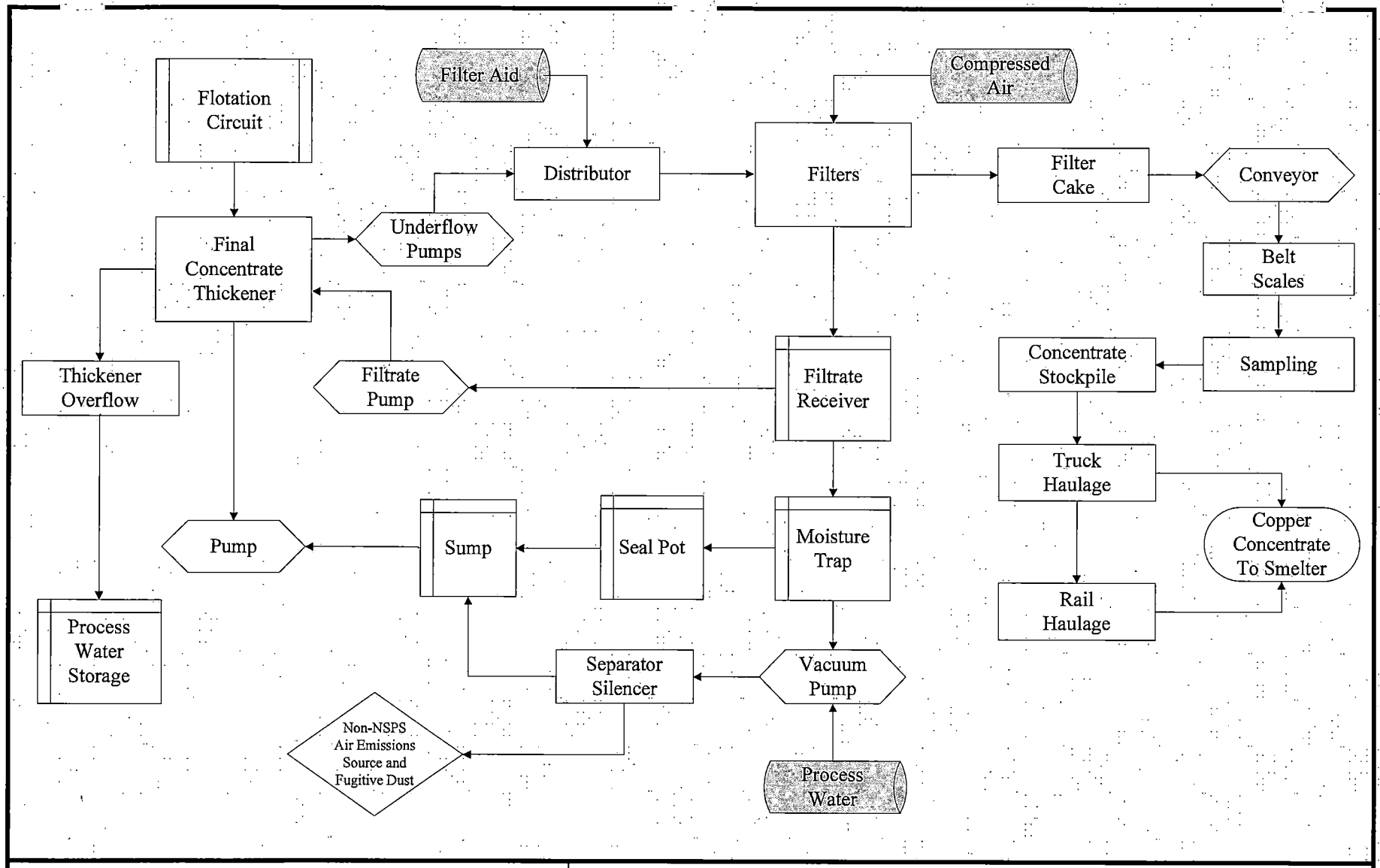


Figure 16 - South Concentrate Dewatering

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

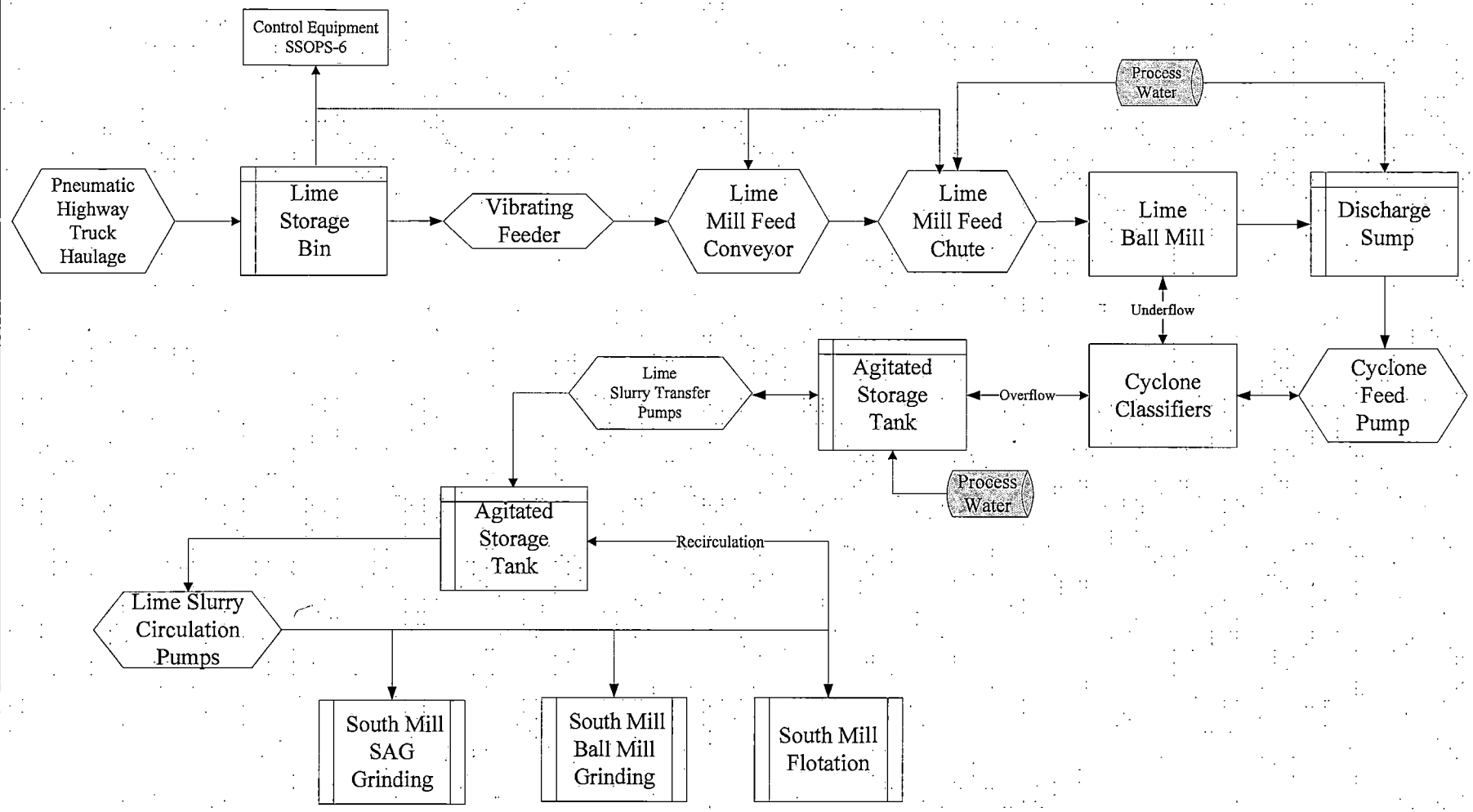


Figure 17 - South Concentrate Dewatering

Environmental Resources Management
555 17th Street, Suite 1700
Denver, CO 80222

Project No: 0407567

Appendix A - Permit Application Completeness Checklist for Class I Source

Reference	Requirement	Meets Requirement (Yes/No/Not Applicable)	Location of Information Within Application
App Form	Has the Standard Application Form been completed?	Yes	Appendix B
App Form	Has the responsible official signed the application form?	Yes	Appendix B
PCC 17.12.510	Have the appropriate application fees been included with the application, if required?	Not Applicable	Not Applicable
Filing Instructions 1.	Has a description of each process unit been included?	Yes	Section 3
Filing Instructions 2.	Has a product and raw material description been included?	Yes	Section 3
Filing Instructions 3 & 4.	Has a complete description of Alternate Operating Scenarios and products been included? (if applicable)	Not Applicable - There are no alternative operating scenarios being requested	Not Applicable
Filing Instructions 5.	Has a Flow Diagram for all processes been provided?	Yes	Figure 4 through 17
Filing Instructions 6.	Has a Material Balance been included (optional, only if emission calculations are based on material balance)?	Yes	Appendix E
Filing Instructions 7.	Has the Emission Sources form been completed and does it include potential emissions of regulated air pollutants (including fugitives)?	Yes	Section 4 and Appendix C
Filing Instructions 8.	Have all applicable SIP requirements been identified?	Yes	Section 6
Filing Instructions 8.	Have all applicable NSPS requirements been identified?	Yes	Section 6
Filing Instructions 8.	Have all applicable NESHAP requirements been identified?	Yes	Section 6
Filing Instructions 8.	Have all applicable Installation/Operating Permit requirements been identified?	Yes	Section 6
Filing Instructions 9.	Have any proposed exemptions and insignificant activities been included (if applicable)? If so, has the applicant provided sufficient evidence?	Yes	Section 6

Reference	Requirement	Meets Requirement (Yes/No/Not Applicable)	Location of Information Within Application
Filing Instructions 10.a, 10.c	Have the maximum annual and hourly process rates for each piece of equipment which generates air emissions been included?	Yes	Appendix D
Filing Instructions 10.b, 10.d	Have the maximum annual and hourly process rates for the whole plant been included?	Not Applicable - The facility currently operates two separate crushing and grinding circuits.	Not Applicable
Filing Instructions 10.e	Has the fuel type and maximum usage (hourly and annual) information been included?	N/A	Fuel is used primarily in generators and dryers. Fuel usage and associated emissions are included in Appendix E.
Filing Instructions 10.f	Has the raw material maximum hourly, monthly or quarterly and annual usage information been included?	Yes	Appendix E
Filing Instructions 10.g	Have the Operating Schedules (hour/day, days/year, days/week, % annual production by season) been included?	Yes	Section 3
Filing Instructions 10.h	Have any limitations on operations and work practice standards affecting emissions been included (if applicable)?	Yes	Section 6 and Appendix E
Filing Instructions 11	Does the application include an equipment list with the type, name make, model, serial number, and date of manufacture?	Yes	Appendix D
Filing Instructions 12	Does the application include the necessary stack information including: stack identification, description, exit height, inside dimensions, exit gas temperature and velocity, and building dimensions?	Yes	Appendix C

Reference	Requirement	Meets Requirement (Yes/No/Not Applicable)	Location of Information Within Application
Filing Instructions 13	Does the application include a site diagram which includes: property boundaries, adjacent streets/roads, directional arrow, elevation, equipment layout, location of emission points, emission areas and air pollution control equipment and the closest distance between emissions and property boundary?	Yes	Figure 1, Figure 2, and Figure 3, Appendix C
Filing Instructions 14.a	Have the applicable test methods for determining compliance been included?	Yes	Section 6
Filing Instructions 14.b	Does the application include an identification, location, and description of Pollution Controls?	Yes	Section 3
Filing Instructions 14.c	Has the rated and operating efficiency of pollution controls been included?	Not Applicable	Source test report demonstrating compliance with the applicable emission rate limits are submitted to PDEQ.
Filing Instructions 14.d	Has the data used to establish efficiency been provided?	Not Applicable	Source test report demonstrating compliance with the applicable emission rate limits are submitted to PDEQ.
Filing Instructions 14.e	Has evidence that the new or modified source will not violate any Ambient Air Quality Standards or PSD increments been provided?	Not Applicable	Facility is an existing source that operates under and existing Class I operating permit. Facility is not requesting a modification of the source.
Filing Instructions 16.a-d (ACID RAIN)	Has a Compliance Plan been included? (The compliance plan must address acid rain provisions, if applicable – 17.12.365 & Title IV of CAA)	Not Applicable	The facility is not subject to the requirements of a Compliance Plan.

Reference	Requirement	Meets Requirement (Yes/No/Not Applicable)	Location of Information Within Application
Filing Instructions 16.a	Does the application include a description of the Compliance Status of the source with respect to all applicable requirements (for constructed/operating sources)?	Yes	Section 8
Filing Instructions 16.a 16.b	Has a description of how the new source or alteration will comply with applicable requirements been included (for new sources or modifications to existing sources)?	Not Applicable	Facility is an existing source that operates under and existing Class I operating permit. Facility is not requesting a modification of the source.
Filing Instructions 16.b.i	Does the application include a statement that the source will continue to comply with the applicable requirements with which they currently comply? (for constructed/operating sources)	Yes	Section 8
Filing Instructions 16.b.ii	Has a statement that the source will meet requirements which become effective before or after permit issuance been included?	Yes	Section 8
Filing Instructions 16.b.iii	Has a compliance schedule with remedial measures and an enforceable sequence of actions with milestones leading to compliance been included for applicable requirements with which the source does not currently comply?	Not Applicable	The source is in compliance with all applicable requirements and currently does not operate under a compliance schedule.
Filing Instructions 16.c	Has a Schedule for Submission of Progress Reports (at least every 6 months) been included? (for sources required to have a compliance schedule)	Not Applicable	The source is in compliance with all applicable requirements and currently does not operate under a compliance schedule.

Reference	Requirement	Meets Requirement (Yes/No/Not Applicable)	Location of Information Within Application
Filing Instructions 17.a.i, ii, iii	Has a Compliance Certification by a responsible official been included? Does the application include an identification of the applicable requirements which are the basis of the certification? Has a Statement of Methods Used to Determine Compliance been included? Has a Schedule for Submission of Compliance Certifications (at least annually) been provided?	N/A	In accordance with the requirements of Section 13.C of the Operating Permit, Asarco submits an Annual Compliance Certification (ACC) indicating whether the facility has complied with the conditions of the Operating Permit, whether the compliance was continuous or intermittent, and the information used to demonstrate compliance.
Filing Instructions 17.a.iv	Does the application include a statement indicating the compliance status with respect to any applicable enhanced monitoring and compliance certification requirements? (if applicable)	N/A	There are no enhanced monitoring and compliance certification requirements currently applicable to the facility.
Filing Instructions 17.b	Does the application include an acid rain compliance plan? (if applicable)	N/A	The facility is not subject to the Acid Rain Program.
Does the application include an acid rain compliance plan? (if applicable)	Have the calculations on which all information is based been included in the application?	Yes	Appendix E

Appendix B - Standard Permit Application Form for Class I Sources

PIMA COUNTY DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Program
33 N. Stone Avenue ▪ Suite 700 ▪ Tucson, AZ 85701 ▪ Phone: (520) 243-7400

STANDARD PERMIT APPLICATION FORM FOR CLASS I SOURCES

(As required by A.R.S. § 49-480, and Title 17 of the Pima County Code)

1. **Permit to be issued to (Arizona Corporate Commission Registered Name):** Asarco LLC

2. **Mailing Address:** 4201 W Pima Mine Road

   City: Sahuarita **State:** AZ **ZIP:** 85629

3. **Plant Name (if different than item #1):** Mission Complex

4. **Name (or names) of Owner or Operator:** Asarco LLC

   FAX #: 520-648-0802 **Phone:** 520-648-2500

   Email:

5. **Name of Owner's Agent:** Thomas H. Phillips

   FAX #: 520-625-9632 **Phone:** 520-648-4528

6. **Plant/Site Manager/Contact Person:** Jamie Ekholm

   FAX #: 520-648-0802 **Phone:** 520-393-4671

   Email: jekholm@asarco.com

7. **Proposed Equipment/Plant Location Address:** Same as above

   City: **State:** **ZIP:**

   Indian Reservation (if applicable): **T/R/S, Lat/Long, Elev:** 31 59' 50.35"N / 111 02' 58.95" W, 3,123 ft.

8. **General Nature of Business:** Mining

   Standard Industrial Classification Code: 1021 **State Permit Class:** Class I (Title V)

9. **Type of Organization:** ☐ Corporation ☐ Individual Owner ☐ Partnership ☐ Government Entity ☒ Other LLC

10. **Permit Application Basis** ***(Check all that apply):*** ☐ New Source ☐ General Permit

    ☒ Renewal *Revision:* ☐ Administrative ☐ Minor ☐ Significant **Existing Permit #** 2026

    Date of Commencement of Construction or Modification: N/A - Permit renewal application.

    Is any of the equipment to be leased to another individual or entity? ☐ Yes ☒ No

11. **Signature of Responsible Official of Organization:**

    Official Title of Signer: General Manager

12. **Typed or Printed Name & E-mail of Signer:** Thomas H. Phillips

    Date: 10-12-17 **Telephone Number:** 520-648-4528

EQUIPMENT LIST

The following table should include all equipment utilized at the facility and be complete with all data requested. The date of manufacture must be included in order to determine if portions of the facility are subject to NSPS. Make additional copies of this form if necessary.

Type of Equipment	Maximum Rated Capacity	Make	Model	Serial Number	Equipment ID Number	Date of Manufacture
(see attached)						

EMISSIO[illegible]OURCES

COMPANY NAME: Asarco, LLC

PAGE _____ OF _____
DATE _____

Estimated "Potential to Emit" per 17.04.340.A.164.
Review of applications and issuance of permits will be expedited by supplying all necessary information on this Table.

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
EMISSION POINT [1]		CHEMICAL COMPOSITION OF TOTAL STREAM	REG. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION POINT [5]			STACK SOURCES [6]					NONPOINT SOURCES [7]	
										EXIT DATA				
NUMBER	NAME	REGULATED AIR POLLUTANT NAME [2]	#/HR [3]	TONS/YEAR [4]	ZONE	EAST (Mtrs)	NORTH (Mtrs)	HEIGHT ABOVE GROUND (ft)	HEIGHT ABOVE STRUC. (ft)	DIA. (ft)	VEL (fps)	TEMP. (°F)	LENGTH (ft)	WIDTH (ft)
Please refer to the following appendices included in this permit renewal application for the requested information:														
Appendix D provides the Emission Point Discharge Parameters														
Appendix F provides the Regulated Air Pollutant Data														

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL _____ feet. PDEQ STANDARD CONDITIONS ARE 293K AND 101.3 KILOPASCALS (17.04.340.A.210)

General Instructions:

1. Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to eight (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K.
2. Components to be listed include regulated air pollutants as defined in 17.04.340.A.182. Examples of typical component names are: Carbon Monoxide (CO), Nitrogen Oxides (NO_X), Sulfur Dioxide (SO_2), Volatile Organic Compounds (VOC), particulate matter (PM), particulate less than 10 microns (PM_{10}), etc. Abbreviations are O.K.
3. Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.
4. Tons per year is annual maximum potential emission expected by applicant, which takes into account process operating schedule.
5. As a minimum applicant shall furnish a facility plot plan as described in the filing instructions. UTM coordinates are required only if the source is a major source or is required to perform refined modeling for the purposes of demonstrating compliance with ambient air quality guidelines.
6. Supply additional information as follows if appropriate:
   (a) Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.
   (b) Stack's height above supporting or adjacent structures if structure is within 3 times the "stack height above the ground" of stack.
7. Dimensions of nonpoint sources as defined in 17.04.34.A.147.

Certification of Compliance with all Applicable Requirements

Permit Number (If existing source) 2026

This certification must be signed by a Responsible Official. Applications without a signed certification will be deemed incomplete.

> *The responsible official is defined as a person who is in charge of principal business functions or who performs policy or decision making functions for the business. This may also include an authorized representative for such persons. For a complete definition, see Pima County Air Quality Control, Title 17, Section 17.04.340(A)(186).*

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Pima County Department of Environmental Quality (PDEQ) as public record. I also attest that I am in compliance with the applicable requirements and will continue to comply with such requirements and any future requirements that become effective during the life of my permit. I will present a certification of compliance to PDEQ no less than annually and more frequently if specified by PDEQ. I further state that I will assume responsibility for the construction, modification, or operation of the source in accordance with the requirements of Title 17 of the Pima County Code and any permit issued thereof.

Name (Print/Type): Thomas H. Phillips Title: General Manager

(Signature): Date: 10-12-17

Certification of Truth, Accuracy, and Completeness

17.12.160(H) - Certification of Truth, Accuracy, and Completeness. Any application form, report, or compliance certification submitted pursuant to this Chapter shall contain certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the documents are true, accurate, and complete.

By my signature I,(Name) Thomas H. Phillips, hereby certify that based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

Signature of Responsible Official of Organization:

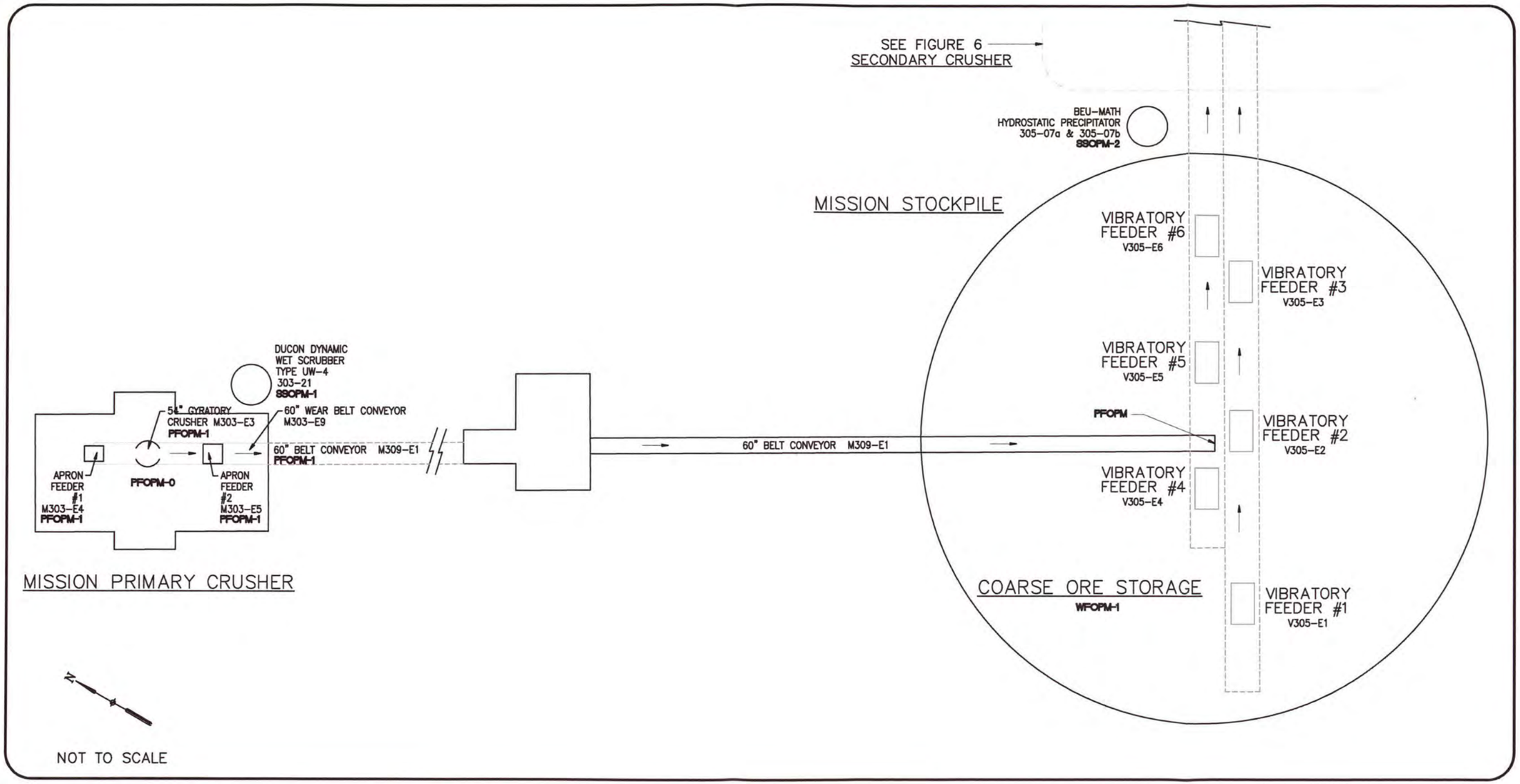
Title: General Manager Date: 10-12-17

Fee Summary for Class I Sources - Revised December 20, 2007	
Application Processing Fee $105.80# per hour (Minimum One Hour – No Maximum	Accelerated Permit Application Fee $15,000*
Class I Source Category	**Administrative Fee**
Aerospace	$15,570
Cement Plants	$47,680
Combustion/Boilers	$11,590
Compressor Stations	$9,530
Electronics	$15,340
Expandable Foam	$10,990
Foundries	$14,610
Landfills	$11,940
Lime Plants	$44,660
Copper and Nickel Mines	$11,220
Gold Mines	$11,220
Mobile Home Manufacturing	$11,110
Paper Mills	$15,330
Paper Coaters	$11,590
Petroleum Products Terminal Facilities	$17,020
Polymeric Fabric Coaters	$15,330
Reinforced Plastics	$11,590
Semiconductor Fabrication	$20,170
Copper Smelters	$47,680
Utilities - Natural Gas	$12,310
Utilities - Fossil Fuel Except Natural Gas	$24,380
Vitamin/Pharmaceutical Manufacturing	$11,830
Wood Furniture	$11,590
Others	$11,940
Others with Continuous Emissions Monitoring	$15,340
Emission Based Fee/ Ton of regulated pollutants	$14.18#

* Fee due 60 days prior to submitting application with letter requesting accelerated processing **(No exceptions)**

Adjusted every November 1 based on the Consumer Price Index for urban consumers published by the US Dept. of Labor. Information is taken from Pima County Code Title 17 Section 17.12.510. Refer to this section for more complete information.

Appendix C - Facility Plot Plan



EPN's:
- SSOPM-1
- SSOPM-2
- PFOPM
- PFOPM-0
- PFOPM-1
- WFOPM-1

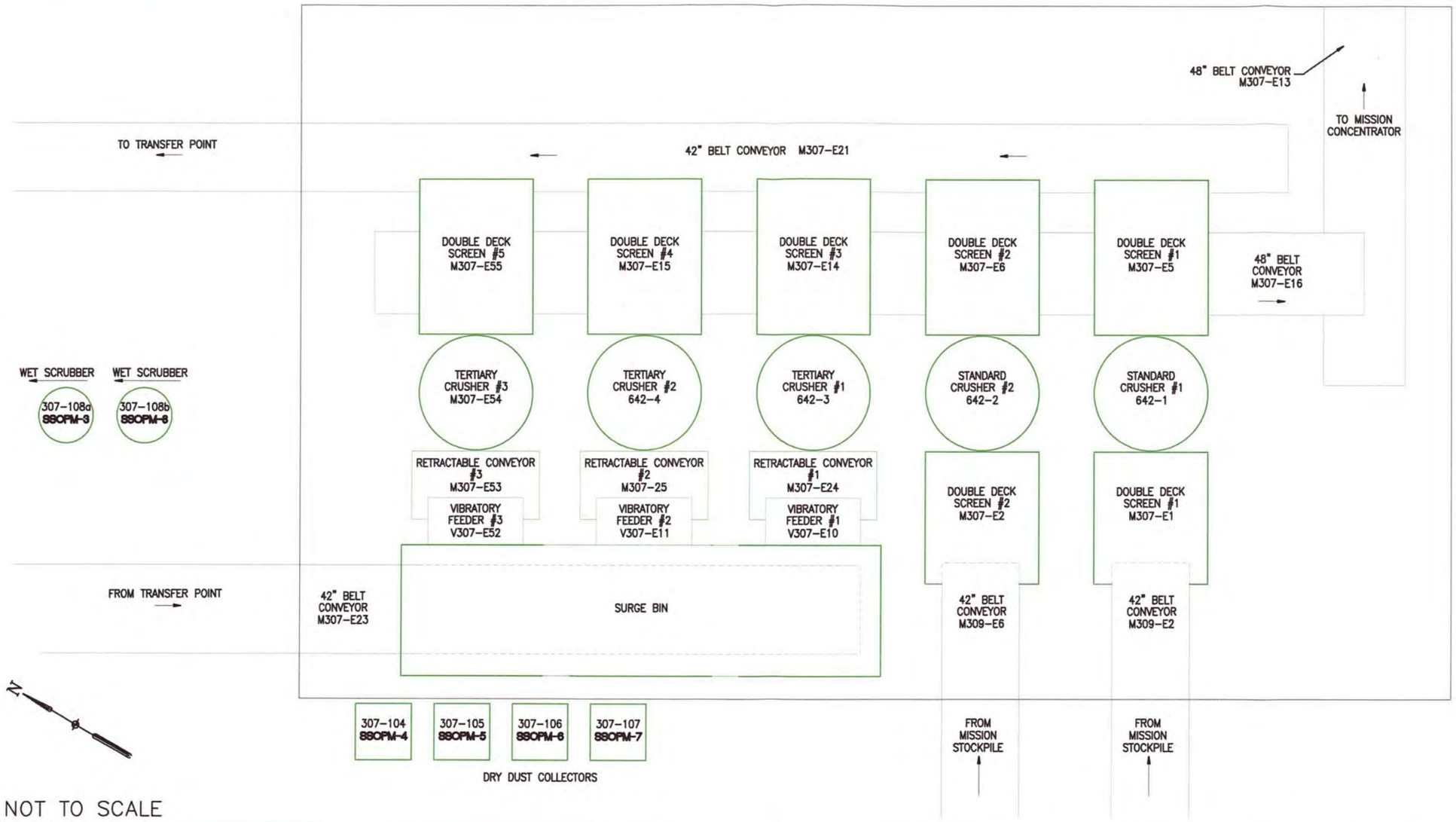
MISSION AIR PERMIT

MIssion Primary Crusher and Stockpile – Equipment Location

Drawn By: MKE	Checked By:	Date: October 2017

ERM FILE: G:\DWGS\0407567 North Mill\0407567-03.dwg

ASARCO MISSION COMPLEX



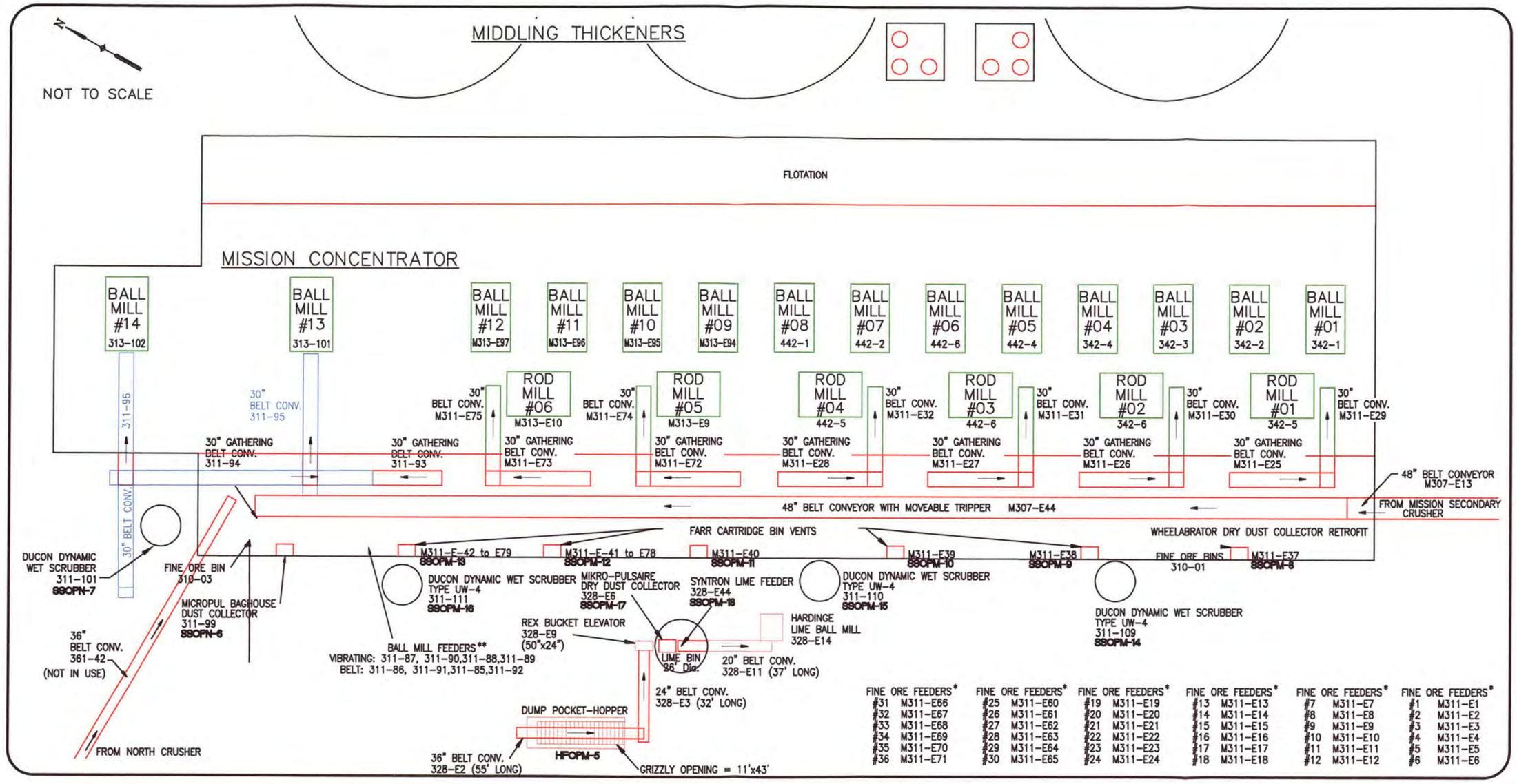
NOT TO SCALE

EPN's:
SSOPM-3
SSOPM-4
SSOPM-5
SSOPM-6
SSOPM-7
SSOPM-8

MISSION AIR PERMIT		
Mission Secondary Crusher – Equipment Location (Proposed)		
Project No. 934X009A	FIGURE 6	
Drawn By: MKE	Checked By: JE	Date: September 2017

FILE: D:\ENVIRONMENTAL\AIR_QUALITY\1T050_REV5mke.DWG

ASARCO MISSION COMPLEX



NOTES:

* FINE ORE FEEDERS DELIVER ORE FROM THE FINE ORE BINS TO THE GATHERING BELT CONVEYORS

** BALL MILL FEEDERS DELIVER ORE FROM THE FINE ORE BIN TO THE GATHERING BELT CONVEYORS

EPN's: SSOPM-8, SSOPM-9, SSOPM-10, SSOPM-11, SSOPM-12, SSOPM-13, SSOPM-14, SSOPM-15, SSOPM-16, SSOPM-17, SSOPM-18, HFOPM-5, SSOPN-6, SSOPN-7

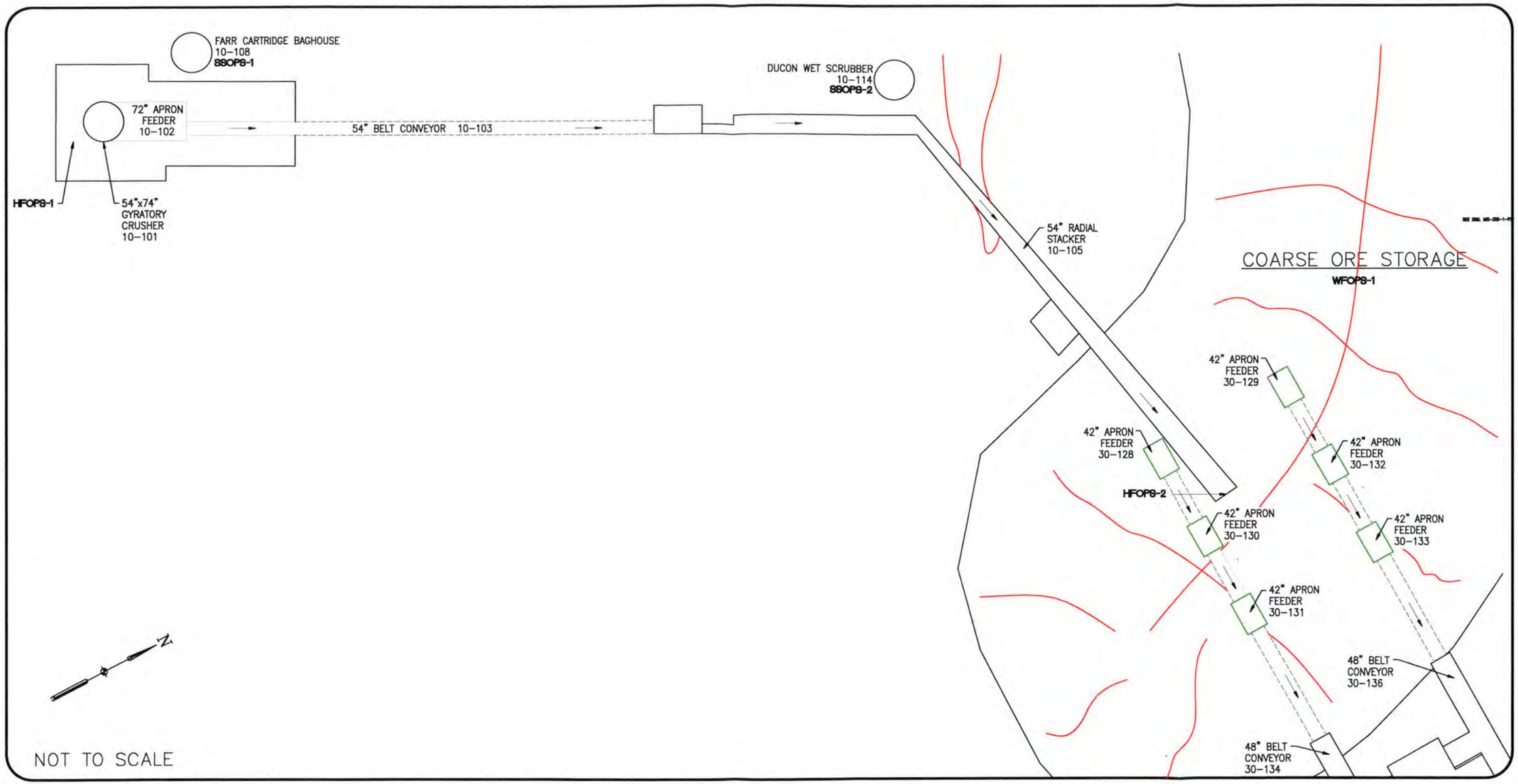
MISSION AIR PERMIT

Mission Concentrator – Equipment Location

Drawn By:	Checked By:	Date: October 2017

ERM FILE: G:\DWGS\0407567 North Mill\0407567-03.dwg

ASARCO MISSION COMPLEX



EPN's: SSOPS-1
SSOPS-2
HFOPS-1
HFOPS-2
WFOPS-1

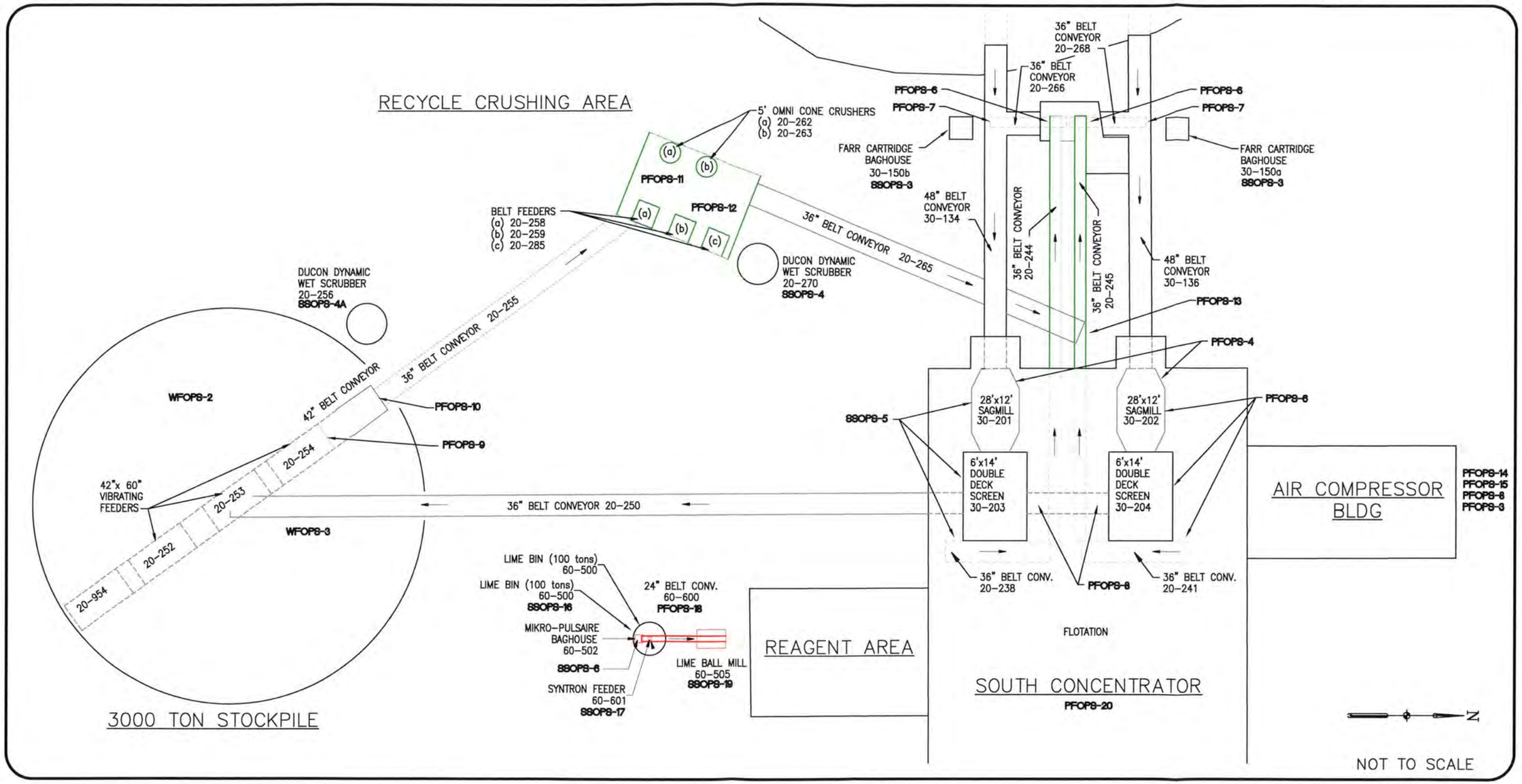
MISSION AIR PERMIT

Mission South Primary Crusher and Stockpile – Equipment Location

Drawn By:	Checked By:	Date: October 2017

ERM FILE: G:\DWGS\0407567 North Mill\0407567-03.dwg

ASARCO MISSION COMPLEX



EPN's:					
	SSOPS-3	PFOPS-4	PFOPS-10	PFOPS-15	PFOPS-20
	SSOPS-4	PFOPS-5	PFOPS-11	PFOPS-16	HFOPS-3
	SSOPS-4A	PFOPS-6	PFOPS-12	PFOPS-17	HFOPS-A
	SSOPS-5	PFOPS-7	PFOPS-13	PFOPS-18	HFOPS-B
	SSOPS-6	PFOPS-8	PFOPS-14	PFOPS-19	WFOPS-2
		PFOPS-9			WFOPS-3

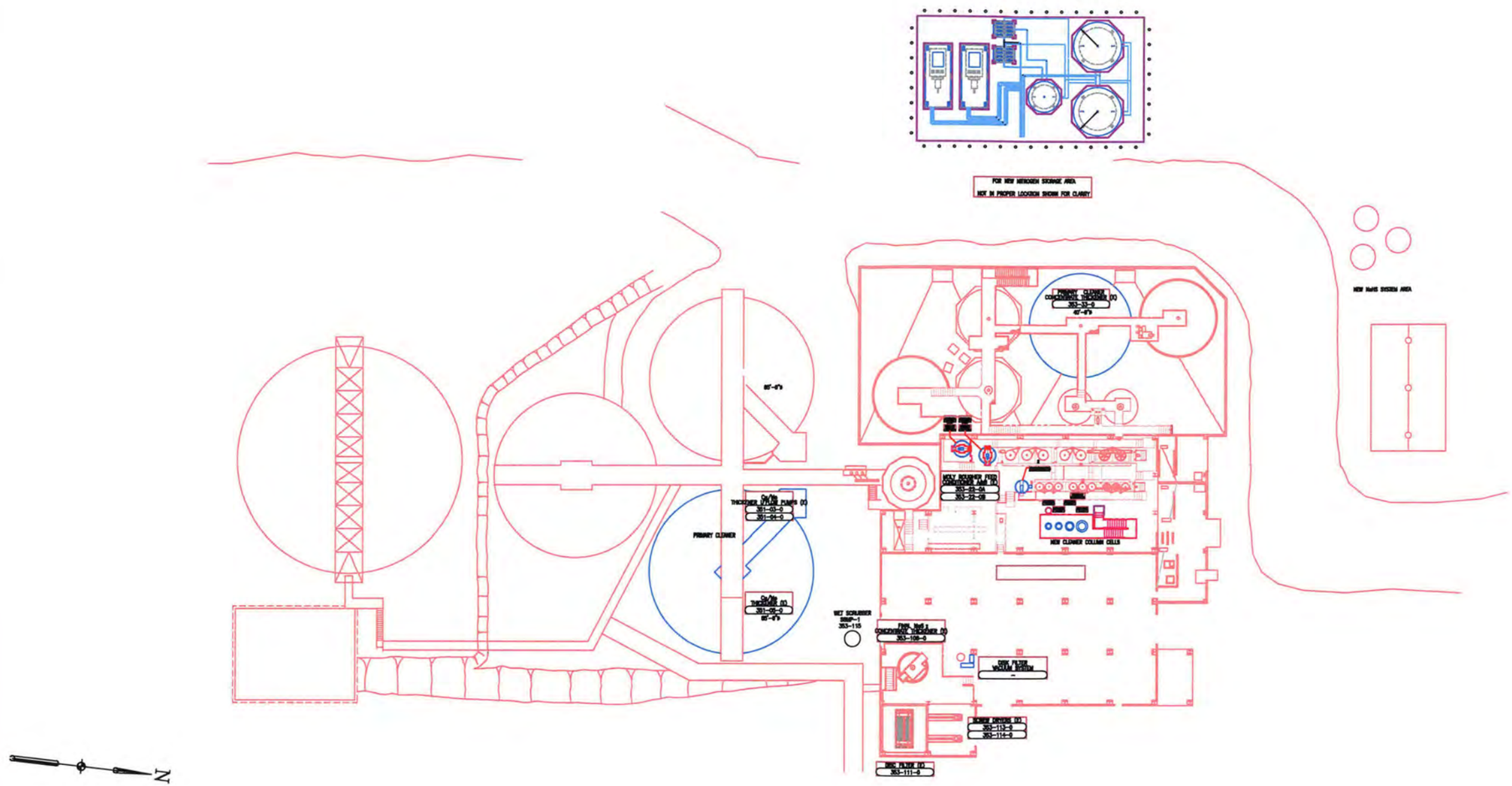
MISSION AIR PERMIT

Mission South Concentrator – Equipment Locations

Drawn By:	Checked By	Date: October 2017

ERM FILE: G:\DWGS\0407567 North Mill\0407567-03.dwg

ASARCO MISSION COMPLEX



NOT TO SCALE

EPN's: SSMP-1

MISSION AIR PERMIT

Mission By-product Plant - Equipment Location

Drawn By: MKE	Checked By:	Date: October 2017

ERM FILE: G:\DWGS\0407567 North Mill\0407567-03.dwg

ASARCO MISSION COMPLEX

Appendix D - Emission Point Information

Point Sources

Equipment Name	Unit ID	Group ID	UTM Coordinates			Stack Height	Stack Flow	Stack Diameter	Stack Length (Rectangular Stack)	Stack Width (Rectangular Stack)	Exhaust Velocity	Exhaust Temperature
			Zone	East	North							
				(meters)	(meters)	(ft)	cfm	(ft)	(ft)	(ft)	(ft/sec)	
SSOPM-1	303-21	1	12 R	494998.00 m E	3539788.00 m N	14' 3"	41,503	4	n/a	n/a	55	Ambient
SSOPM-2	305-07a	2	12 R	495154.00 m E	3539927.00 m N	9' 4"	11,000	n/a	1.17	1.58	55	Ambient
SSOPM-2	305-07b	2	12 R	495155.00 m E	3539924.00 m N	9' 4"	11,000	n/a	1.17	1.58	55	Ambient
SSOPM-3	307-108a	3	12 R	495038.00 m E	3539949.00 m N	40'	10,000	1.83	n/a	n/a	63	Ambient
SSOPM-3	307-108b	3	12 R	495042.00 m E	3539951.00 m N	40'	10,000	1.83	n/a	n/a	63	Ambient
SSOPM-4	307-104	4	12 R	495110.00 m E	3539984.00 m N	21' 7"	42,000	4	n/a	n/a	56	Ambient
SSOPM-5	307-105	4	12 R	495114.00 m E	3539977.00 m N	21' 7"	42,000	4	n/a	n/a	56	Ambient
SSOPM-6	307-106	4	12 R	495114.00 m E	3539987.00 m N	21' 7"	42,000	4	n/a	n/a	56	Ambient
SSOPM-7	307-107	4	12 R	495119.00 m E	3539980.00 m N	21' 7"	42,000	4	n/a	n/a	56	Ambient
SSOPN-6	311-99	6	12 R	494989.80 m E	3540269.56 m N	7' 6"	6,312	n/a	1.17	1.33	85	Ambient
SSOPN-7	311-101	7	12 R	494974.08 m E	3540287.89 m N	15'	16,899	3.5	n/a	n/a	29	Ambient
SSOPM-8	M311-E37	8	12 R	495060.18 m E	3540148.47 m N	5'	7,500	n/a	1.17	1.71	63	Ambient
SSOPM-9	M311-E38	9	12 R	495047.00 m E	3540169.00 m N	5'	2,750	n/a	1.17	1.42	56	Ambient
SSOPM-10	M311-E39	9	12 R	495034.00 m E	3540192.00 m N	5'	2,750	n/a	1.17	1.42	56	Ambient
SSOPM-11	M311-E40	9	12 R	495019.00 m E	3540218.00 m N	5'	2,750	n/a	1.17	1.42	56	Ambient
SSOPM-12	M311-E41	9	12 R	495008.00 m E	3540237.00 m N	5'	2,750	n/a	1.17	1.42	56	Ambient
SSOPM-13	M311-E42	9	12 R	494996.00 m E	3540258.00 m N	5'	2,750	n/a	1.17	1.42	56	Ambient
SSOPM-14	311-109	10	12 R	495042.00 m E	3540161.00 m N	15'	17,500	2.5	n/a	n/a	59	Ambient
SSOPM-15	311-110	10	12 R	495020.00 m E	3540200.00 m N	15'	17,500	2.5	n/a	n/a	59	Ambient
SSOPM-16	311-111	10	12 R	494988.00 m E	3540257.00 m N	15'	17,500	2.5	n/a	n/a	59	Ambient
SSOPM-17	328-E6	11	12 R	494980.11 m E	3540232.16 m N	3' 4"	1,500	0.5	n/a	n/a	127	Ambient
SSOPS-1	10-108	14	12 R	494037.00 m E	3537832.00 m N	8'	21,000	4.25	n/a	n/a	25	Ambient
SSOPS-2	10-114	15	12 R	494090.35 m E	3537919.10 m N	9' 3"	4,471	2	n/a	n/a	24	Ambient
SSOPS-3	30-150a	17	12 R	494216.00 m E	3537929.00 m N	20	12,500	3	n/a	n/a	29	Ambient
SSOPS-3	30-150b	17	12 R	494216.00 m E	3537949.00 m N	20	12,500	3	n/a	n/a	29	Ambient
SSOPS-4	20-270	18	12 R	494240.00 m E	3537885.00 m N	14'	13,000	3	n/a	n/a	31	Ambient
SSOPS-4A	20-256	18	12 R	494252.00 m E	3537827.00 m N	8'	12,500	3.5	n/a	n/a	22	Ambient
SSOPS-6	60-502	16	12 R	494296.00 m E	3537886.00 m N	4' 6"	2,000	0.83	n/a	n/a	61	Ambient

Non-Point Sources

Source ID	Source Description	Height (ft)	Diameter (ft)
WFOPM-1	Mission Circuit Coarse Ore Stockpile	50	350
WFOPM-2	Mission Concentrate Stocpile	25	200
WFOPS-1	Sourth Circuit Coarse Ore Stockpile	60	400
WFOPS-2	Sourth Circuit Intermediate Ore Stockpile	20	200
WFOPS-3	South Concentrate Stocpile	25	200

Appendix E - Equipment List and Process Rates

Mission Primary Crushing								
Equipment Name/ Equipment ID	**Emission Point**	**Equipment Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Primary Crusher (M303-E3)	SSOPM-1	Crusher (Gyratory), Water Sprays at dump pocket	Traylor 54 X 60 inch	TC	77200	6/61	3,200 TPH	N
Two Apron Feeders (M303-E4 and E5)	HFOPM-1	Pan	Stephens Adamson	SA Aurora 11945-LA	M-2162-2 (both feeders)	6/61	3,200 TPH	N
Wearbelt (M303-E9)	SSOPM-1	60 inch conveyer, spray bars at conveyor head	N/A	N/A	N/A	6/61	3,200 TPH	N
Wet Scrubber	SSOPM-1	UW-4	Ducon	Size 108	N/A	Prior to August 25, 1982	41,503 SCFM	N
Conveyor (M309-E1)	HFOPM-2	60 inch conveyer, water spray used at transfer to coarse ore storage (WFOPM-1)	N/A	Stacker	N/A	6/61	900 HP, 2,290 TPH	N
Vibratory Feeders (V305-E1 through E6)	SSOPM-2	Feeders, controlled by wet scrubber SSOPM-2 and water sprays	Syntron	F86-D	110324 through 110328 and 358093	6/61	13 HP, 328 TPH	Y
Wet Scrubber (305-07a)	SSOPM-2	Wet Scrubber	Beu-Math Engineering	N/A	288200	2011	11,000 CFM	Y
Wet Scrubber (305-07b)	SSOPM-2	Wet Scrubber	Beu-Math Engineering	N/A	288200	2011	11,000 CFM	Y
Conveyor to Secondary Crusher (M309-E2 and M309-E-6)	Various	42 inch conveyer, controlled by dust collectors	N/A	N/A	N/A	8/93	1,750 TPH (each)	Y

Mission Secondary / Tertiary Crushing								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Double Deck Screens (M307-E1 and M307-E2)	SSOPM-4 through SSOPM-7	Ore Screens, 10'x 20'	Svedala	Double Deck X H Low Head	N/A	1998	75 HP 1,600 TPH (each)	Y
Secondary Crusher (642-1 and 642-2)	SSOPM-4 through SSOPM-7	Standard Crusher, Fine Crushing	Nordberg	MP800	MP800	1998	800 HP 1,300 TPH (each)	Y
Double Deck Screens (M307-E5 and M307-E6)	SSOPM-4 through SSOPM-7	Ore Screens, 8' x 20' Spray bars located at drop points to conveyor M307-E21	Svedala	Double Deck Low Head	N/A	1998	40 HP 1,300 TPH (each)	Y
Conveyor (M307-E21)	N/A	42 inch belt conveyer, Water spray heads at the transfer tower	N/A	Single Deck Oversize	N/A	8/90 (modified)	200 HP, 1,968 TPH	Y
Conveyor (M307-E23)	N/A	42 inch belt conveyer, Water spays and wet scrubber at drop point from M307-E21	N/A	N/A	N/A	8/90 (modified)	250 HP, 1,968 TPH	Y
Surge Bin (307-E8, 307-E9 and 307-E51)	N/A	Tertiary feed	N/A	N/A	N/A	Prior to August 25,1982	500 Live Tons/each	Y (307-E8 and 307-E-9)
Vibratory Feeders (V307-E10, E11, E52)	N/A	Vibratory	Syntron	F86-D	11246, 11247, 237667	6/61, 6/61, 2/67	13 HP, 1,968 TPH/total	N
Feed Conveyor (M307-E24, E25, E53)	N/A	Retractable	N/A	N/A	N/A	8/93 (modified)	10 HP, 1,968 TPH/total	Y

Mission Secondary / Tertiary Crushing								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Tertiary Crusher (307-E12, 307-E13, M307-E54)	N/A	7 foot fine crushing	Nordberg	MP800	MP800-107, MP800-108, MP800-109,	1998	800 HP, 1,968 TPH/total	Y
Double Deck Screens (M307-E14, E15, E55)	N/A	8 x 20 foot	Svedala	Double Deck Low Head	N/A	1998	40 HP, 2,500 TPH/total	Y
Double Deck Conveyor (M307-E16)	N/A	48-inch conveyer	N/A	Double Deck	N/A	8/93 (modified)	75 HP, 2,500 TPH	Y
Dry Dust Collectors .(307-104)	SSOPM-4	Dry Dust Collector	Donaldson Torit	DFE 4-48	TBD	TBD	42,000 scfm	Y
Dry Dust Collector (307-105)	SSOPM-5	Dry Dust Collector	Donaldson Torit	DFE 4-48	TBD	TBD	42,000 scfm	Y
Dry Dust Collector (307-106)	SSOPM-6	Dry Dust Collector	Donaldson Torit	DFE 4-48	TBD	TBD	42,000 scfm	Y
Dry Dust Collector (307-107)	SSOPM-7	Dry Dust Collector	Donaldson Torit	DFE 4-48	TBD	TBD	42,000 scfm	Y
Wet Scrubber (307-108a)	SSOPM-3	Dynamic	Beu-Math Engineering	Size 1500-STD	198202	7/2011	10,000 CFM	Y
Wet Scrubber (307-108b)	SSOPM-3	Dynamic	Beu-Math Engineering	Size 1500-STD	308369	1/2013	10,000 CFM	Y
Feed Conveyor (M307-E13)	N/A	Conveyer Belt, Spray bar at conveyor tail end	N/A	N/A	N/A	8/93	500 HP, 2,500 TPH	Y
Feed Conveyor (M307-E44)	N/A	Fine Ore Bins Conveyor	N/A	N/A	N/A	1988 Extend	HP (TBD), 2,500 TPH	Y

Mission Secondary / Tertiary Crushing								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Tripper Car (M311-E45)	SSOPM-13	Fabricated by Cimetta Engineering	Cimetta Engineering	N/A	N/A	6/61	5 HP, 2,500 TPH	N
Fine Ore Bins (6) (310-01)	N/A	Fine Ore storage	N/A	N/A	N/A	Approx. 1960	2,000 tons-live storage capacity each	N
Fine Ore Feeder Belts (M311-E1, 311-E24, M311- E60, 311-E71)	N/A	36 inch, Fixed and Variable speed conveyors.	N/A	N/A	N/A	6/61, 2/67	(12) Fixed Speed Conveyors 3 hp, 20-80 TPH each (24) Variable Speed Conveyors, 50- 80 TPH each	N
Conveyor (M311-E25 through M311-E28, M311- E72, M311-E73)	N/A	30inch	N/A	N/A	N/A	6/61, 2/67	3 HP, 300 TPH/each	N
Conveyor (M311-E29, M311-E32, M311-E74, M311-E75)	N/A	Rod Mill Feed	N/A	N/A	N/A	6/61, 2/67	5 HP, 300 TPH/each	N
Gathering Belts (311-93, 311-93A, 311-94)	N/A	30 inch	N/A	N/A	N/A	2/89	15 HP, 150 TPH	Y
Feeder belts (311-85, 311-86, 311-91, 311-92)	N/A	36inch	N/A	N/A	N/A	2/89	3.5 HP, 150 TPH	Y
Dust Collectors (M311-E37)	SSOPM-8	Dry	Wheelabrator/ Scientific Insert	112-D	A111115	Approx. 1960 (Refurbished in 2009)	7500 AWCFM	Y

Mission Secondary / Tertiary Crushing								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Dust Collectors (M311-E38, M311-E39, and M38-E40 M311-E78, M311-E79)	SSOPM-9 through SSOPM-13	Dry	FARR	GS4	882507001	2009	2750 AWCFM	Y
Wet Scrubber (311-109 through 311-111)	SSOPM-14 SSOPM-15 SSOPM-16	UW-4	Ducon	Size 66	C91-1100	Prior to Aug. 25,1982	75 HP, 10,283 SCFM	N
Dust Collector (311-99)	SSOPN-6	1005-10 "C"	Mikro-Pulsaire Baghouse	1005	880498111	Approx. 1972	25 HP, AWCFM=6,312	Y
Wet Scrubber (311-101)	SSOPN-7	UW-4	Ducon	III, Size 84	C72-367	Approx. 1972	60HP, 16,899 SCFM	Y

South Crusher								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Crusher (10-101)	PFOPS-1	54 x 74 inch, water spray at dump pocket	Allis-Chalmers	Gyratory	B-38040	1/72	500 HP, 3,300 TPH	Y
Apron Feeder (10-102)	PFOPS-0	72 inch	NICO (National Iron Company)	Apron	8497-285	1/72	30 HP 3,300 TPH	Y
Dry Dust Collector (10-108)*	SSOPS-1	Cartridge Dust Collector	GS40/32	GS40/32	A76231001	10/13/2013	21,000 SCFM	Y
Conveyer (10-103)	PFOPS-2	54 inch	N/A	N/A	A/A	1/72	500 HP, 3,300 TPH	N
Wet Scrubber (10-114)	SSOPS-2	UW-4	Ducon	Size 42	C-90-1045	Approx. 1970	20 HP, 4,471 SCFM	N
Radial Stacker (10-105)	HFOPS-2	54 inch X 585 feet, water spray heads at head end of belt-discharge to stockpile	Barber Greens	G.O. 201008	N/A	1/72	350 HP, 3,300 TPH	N
Feeders (30-130, 30-131, 30-132, 30-133)		42 inch	NICO (National Iron Company)	FD-4465	FD-4465-293, through FD-4465-296	1/72	7.5 HP, 500 TPH/each	N
Feeders (30-128, 30-129)[1]		42 inch	NICO (National Iron Company)	FD-4465	N/A	2013	7.5 HP, 500 TPH/each	Y
Conveyor (30-134, 30-136)		48 inch, SAG Conveyor	N/A	N/A	N/A	6/14/70	150 HP, 1000 TPH EACH	N
Dry Dust Collector (30-150A)	SSOPS-3	Cartridge Filter	FARR	GS24/20	A41199001	2012	12,500 cfm	Y[3]

[1] The 2013 permit application installing the new feeders identified the new feeders as Equipment ID 30-930 and 30-932. The facility has since revised the equipment ID's for these two feeders to 30-128 and 30-129.

South Crusher								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Dry Dust Collector (30-150B)	SSOPS-3	Cartridge Filter	FARR	GS24/20	A41199002	2012	12,500 cfm	Y[3]
Stockpile Feed Conveyor (20-250)		36 inch, X 1,035 feet, SAG Recycle	N/A	N/A	N/A	Prior to Aug. 25, 1982	1,000 TPH	N
Vibrating Feeders (20-252, 20-253, 20-254, 20-954)		42 x 60 inch, Vibrating, SAG Recycle	FMC Syntron	F-450-B-DT	657887, 657889, 65789, TBD	10/89, TBD	10 HP, 200 TPH-each	Y
Stockpile Reclaim Conveyor (20-251)		36 inch X 350 feet, SAG recycle	N/A	N/A	N/A	10/89	20 HP, 900 TPH	Y
Surge Bin Feed Conveyor (20-255)		54 inch X 408 feet, SAG recycle, water spray head at tail end	N/A	N/A	N/A	10/89	10 HP, 600 TPH	Y
Surge Bin (20-257)		SAG recycle	N/A	N/A	N/A	10/89	400 TPH	Y
Belt Feeder Bypass (Omnicone) (20-285)		30 inch X 20 feet	N/A	N/A	N/A	10/89	3 HP, 400 TPH	Y
Omnicone Belt Feeder (20-258, 20-259)		30 inch X 20 feet	N/A	N/A	N/A	10/89	3 HP, 200 TPH (each)	Y
Omni Cone Crusher (20-262, 20-263)		5 foot w/ medium bowl	Rexnord	1560	1560 0323 C3017 7089, 1560 0322 C3017 70086	10/89	250 HP, 200 TPH (each)	Y
Wet Scrubber (20-270)	SSOPS-4	Wet Scrubber	Beu-Math	BME-1750-SDS	268496	10/13	13,000 CFM	Y

South Crusher								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Wet Scrubber (20-256)	SSOPS-4a	UW-4	Ducon	72	C70-356	12/11/70	75 HP, 14,800 CFM	N
Omnicone Discharge Conveyor (20-265)	SSOPS-5	36 inch X 500 feet, water spray heads at tail end of conveyor, SAG recycle	N/A	N/A	N/A	10/89	50 HP, 400 TPH	Y
Grizzly Oversize Conveyor (20-244 and 20-245)						1/72	400 TPH	Y
Recycle Conveyor (20-266, 20-268)		36 inch, SAG recycle	N/A	N/A	N/A	1/72	10 HP, 400 TPH each	Y

Lime Handling								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Mission Mill Lime Bin Collector (328-E6)	SSOPM-17	Baghouse, Dry	Mikro-Pulsaire	16S-8-30B	992020H1	1999	3 HP, 1500 CFM	N
South Mill Lime Bin Dust Collector (60-502)	SSOPS-6	Dry Dust Collector	FARR	GS4	A85479001	10/7/13	7.5HP 2000CFM	N
Mission Mill Lime Feeder Conveyor (HFOPM-5)		Dry lime handling, 36 inch X 55 foot belt	N/A	N/A	N/A	1960	Varies, only runs on 8 hour day, intermittent feed	N
Mission Mill Lime Feed to Bucket Elevator Conveyor (328- E3)		24 inch X 32 foot belt	N/A	N/A	N/A	1960	Varies, only runs on 8 hour day, intermittent feed	N
Mission Mill REX Bucket Elevator (328-E9)		Lime	Chain Belt Company	N/A	N/A	Approx. 1960	Varies, only runs on 8 hour day, intermittent feed 0-8 tons/hour	N
Mission Mill Lime Feed Conveyor (328-E11)		20 inches X 37 foot belt	N/A	N/A	N/A	Approx. 1960	0-8 Tons/hour, Varies, Intermittent feed	N
Mission Mill Lime Hopper		Lime	N/A	N/A	N/A	Approx. 1960	40tons	N
Mission Mill Lime Feeder (328-E44)	SSOPM-18	F33D1, style 018551	Syntron	C-54490	112501	Approx. 1960	0-8 tons/hour, Varies, Intermittent feed	N
Mission Mill Dry Lime Bin		Dry Lime	N/A	N/A	N/A	Approx. 1960	Approx. 250 tons	N

Lime Handling								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
South Mill Lime Bin (60-500)		Dry Lime Storage	N/A	N/A	N/A	Approx. 1972	100 tons	N
South Mill Lime Belt (60-600)		24-inch, Lime Transport	N/A	N/A	N/A	Approx. 1972	100 TPH	N
South Mill Lime Bin Vibratory Feeder (60-601)		Vibra Flow	Syntron	V-20	12277	Approx. 1972	100 TPH	N

By Products Plant								
Name (Equipment ID)	**Emission Point**	**Type**	**Make**	**Model**	**Serial Number**	**Date of Manufactur**	**Design Capacity**	**NSPS Applicable**
Screw Dryer (353-113)		Natural Gas Fired	Maxon Burner	N/A	N/A	1978	3,000,000 BTU 2,000 lb./hour	Y
Screw Dryer (353-114)		Natural Gas Fired, standby dryer for 353-113	N/A	N/A	N/A	Approx. 1981	3,000,000 BTU 2,000 lb./hour	Y
Wet Dust Collector (353-115)	SSMP-1	UW-4, Stainless Steel	Ducon-54	IV	DC13-5192	2013	7,000 cfm	Y
Screw Dryer Holding Hopper (353-119)		Molybdenum concentrate	Fabricated on site	N/A	N/A	Approx. 1978	2,000 lbs./hour	Y
Screw Dryer Holding Hopper (353-120)		Molybdenum concentrate	Fabricated on site	N/A	N/A	Approx. 1981	2,000 lbs./hour	Y
Product Bagging System (353-121)			FORM PAK	2100 SSD	120807-02-01 AND 120807- 02-02	04/12/2013	2,000 lbs/hour	Y

Generators								
Name (Equipment ID)	**Emission Point**	**Fuel Type**	**Make**	**Model**	**Serial Number**	**Date of Manufacture**	**Design Capacity**	**NSPS Applicable**
Power Generator (23-001)	CFMA-1	Diesel	Detroit Diesel	12V-71	29921	Before 1980	350 KW, 500 HP	N
Power Generator (23-002)	CFMA-2	Diesel	Detroit Diesel	12V2000	5352005073	4/2008	750 KW, 1,100 HP	N
Power Generator (23-003)	CFMA-3	Diesel	Detroit Diesel	16V149	16E11135	4/1997	1,500 KW, 2,200 HP	N
North Mill Generator	MMEME-GEN-AD	Diesel	John Deer	4045HFG92	TBD	2014	56 kW	IIII
North Mill Thickener Generator	MMEME-GEN-TH	Diesel	CAT/Perkins	D 80-6 (C4.4)	00C44CGLD00683	2012	63 kW	IIII
Dispatch Shack Generator	MMEME-GEN-DSP	Diesel	John Deer	4045HFG92	TBD	2014	56 kW	IIII
Emergency Generator	SMEME-GEN-1	Diesel	Cummins	KTA-1150-G5	31121055	01/1981	365 KW, 489 HP	ZZZZ
South Mill Tank Hill Emergency Generator	SMTHEME-GEN	Propane	Olympian	G35LG2	ENGXB05.42L2	05-2014	60 kW	JJJJ

Gasoline Dispensing Facility			
Name (Equipment ID)	**Design Capacity**	**Monthly Throughput**	**Applicable NESHAP Subpart**
Gasoline Storage Tank	20,000 gallons	< 10,000 gallons	CCCCCC

Appendix F - Detailed Potential to Emit (PTE) Calculations

POTENTIAL TO EMIT
CRITERIA AIR POLLUTANTS
ASARCO MISSION COMPLEX

Number	Emissions Source/Activity	Emissions (Uncontrolled)														Emissions (Controlled)						Control Device	Emissions Summary		
		PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	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)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)		(ton/yr)	(ton/yr)	(ton/yr)
	Facility-wide	**136.26**	**80.09**	**23.52**	**158.16**	**127.23**	**30.28**	**9.02**	**767.57**	**475.09**	**107.35**	**313.20**	**209.95**	**51.98**	**11.64**	**1,620.37**	**552.43**	**119.08**	**6,626.66**	**2,187.14**	**455.78**		**7,394.24**	**2,662.23**	**563.14**
	Mining Subtotal	72.26	49.46	17.70	83.84	108.26	28.79	5.70	491.68	345.30	86.26	305.07	199.04	51.23	4.17	1,238.24	353.32	36.85	5,423.49	1,547.54	161.41		5,915.16	1,892.84	247.67
OFMA-1	Drilling	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.69	1.69	1.69	7.39	7.39	7.39	Shields/water	7.39	7.39	7.39
OFMA-2	Blasting	9.64	5.01	0.29	62.90	15.96	1.88	n/a	42.20	21.95	1.27	275.50	69.90	8.22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	None	42.20	21.95	1.27
CFMA-1	Generator	1.10	1.10	1.10	3.34	15.50	1.03	3.44	0.14	0.14	0.14	0.42	1.94	0.13	0.43	n/a	n/a	n/a	n/a	n/a	n/a	None	0.14	0.14	0.14
CFMA-2	Generator	0.70	0.70	0.70	5.50	24.00	8.09	0.71	1.40	1.40	1.40	11.00	48.00	16.18	1.41	n/a	n/a	n/a	n/a	n/a	n/a	None	1.40	1.40	1.40
CFMA-3	Generator	1.54	1.54	1.54	12.10	52.80	17.80	1.55	2.31	2.31	2.31	18.15	79.20	26.70	2.33	n/a	n/a	n/a	n/a	n/a	n/a	None	2.31	2.31	2.31
VFMA-1	Haulage	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	976.75	277.75	27.78	4,278.15	1,216.55	121.66	Road watering	4,278.15	1,216.55	121.66
VFMA-2	Dozing	14.17	10.63	1.49	n/a	n/a	n/a	n/a	248.04	186.03	26.04	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	None	248.04	186.03	26.04
VFMA-3	Grading	25.53	15.32	0.79	n/a	n/a	n/a	n/a	111.80	67.08	3.47	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	None	111.80	67.08	3.47
VFMA-4	Rubber Tire Rigs	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	124.78	35.48	3.55	546.54	155.42	15.54	Road watering	546.54	155.42	15.54
VFMA-5	Land Clearing	11.19	11.19	11.19	n/a	n/a	n/a	n/a	49.00	49.00	49.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	None	49.00	49.00	49.00
VFMA-6	Misc. Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	135.02	38.40	3.84	591.40	168.17	16.82	Road watering	591.40	168.17	16.82
HFMA-1	Unloading	8.40	3.97	0.60	n/a	n/a	n/a	n/a	36.79	17.40	2.63	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	None	36.79	17.40	2.63

POTENTIAL TO EMIT
CRITERIA AIR POLLUTANTS
ASARCO MISSION COMPLEX

Number	Emissions Source/Activity	Emissions (Uncontrolled)														Emissions (Controlled)						Control Device	Emissions Summary		
		PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$
	Mission Circuit Subtotal	3.49	1.40	0.39	0.00	0.00	0.00	0.24	15.30	6.13	1.73	0.00	0.00	0.00	1.04	167.35	98.56	49.24	732.97	431.69	215.67		748.27	437.82	217.40
SSOPM-1	Primary Crusher	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.55	1.55	1.55	6.81	6.81	6.81	Scrubber	6.81	6.81	6.81
SSOPM-2a	Transfer to Secondary (North)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.06	2.06	2.06	9.02	9.02	9.02	Scrubber	9.02	9.02	9.02
SSOPM-2b	Transfer to Secondary (South)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.06	2.06	2.06	9.02	9.02	9.02	Scrubber	9.02	9.02	9.02
SSOPM-3	(307-108A); Sec. & Tertiary Crushing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.87	1.87	1.87	8.20	8.20	8.20	Scrubber	8.20	8.20	8.20
SSOPM-3	(307-108B); Sec. & Tertiary Crushing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.87	1.87	1.87	8.20	8.20	8.20	Scrubber	8.20	8.20	8.20
SSOPM-4	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.72	0.72	0.72	3.15	3.15	3.15	Scrubber	3.15	3.15	3.15
SSOPM-5	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.72	0.72	0.72	3.15	3.15	3.15	Scrubber	3.15	3.15	3.15
SSOPM-6	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.72	0.72	0.72	3.15	3.15	3.15	Scrubber	3.15	3.15	3.15
SSOPM-7	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.72	0.72	0.72	3.15	3.15	3.15	Scrubber	3.15	3.15	3.15
SSOPM-8	Transfer Ore to Tripper Car	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.40	1.40	1.40	6.15	6.15	6.15	Baghouse	6.15	6.15	6.15
SSOPM-9	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.52	0.52	0.52	2.26	2.26	2.26	Baghouse	2.26	2.26	2.26
SSOPM-10	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.52	0.52	0.52	2.26	2.26	2.26	Baghouse	2.26	2.26	2.26
SSOPM-11	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.52	0.52	0.52	2.26	2.26	2.26	Baghouse	2.26	2.26	2.26
SSOPM-12	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.52	0.52	0.52	2.26	2.26	2.26	Baghouse	2.26	2.26	2.26
SSOPM-13	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.52	0.52	0.52	2.26	2.26	2.26	Baghouse	2.26	2.26	2.26
SSOPM-14	Transfer to Rod Mill	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.50	1.50	1.50	6.57	6.57	6.57	Scrubber	6.57	6.57	6.57
SSOPM-15	Transfer to Rod Mill	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.50	1.50	1.50	6.57	6.57	6.57	Scrubber	6.57	6.57	6.57
SSOPM-16	Transfer to Rod Mill	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.50	1.50	1.50	6.57	6.57	6.57	Scrubber	6.57	6.57	6.57
SSOPN-6	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.18	1.18	1.18	5.18	5.18	5.18	Dry Dust Collector	5.18	5.18	5.18
SSOPN-7	Transfer to Ball Mills	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3.16	3.16	3.16	13.86	13.86	13.86	Wet Scrubber	13.86	13.86	13.86
SSOPM-17	Lime Conveyance	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.14	0.14	0.14	0.63	0.63	0.63	Dry Dust Collector	0.63	0.63	0.63
SSOPM-18	Lime Transfer feeder to Conveyor	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.14	0.14	0.14	0.63	0.63	0.63	Dry Dust Collector	0.63	0.63	0.63
HFOPM-5	Mission Mill Lime Feeder Conveyor	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.36	4.36	4.36	19.10	19.10	19.10	Enclosure	19.10	19.10	19.10
HFOPM-1	Dump Pocket	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	68.70	34.35	9.72	300.91	150.45	42.58	Water spray	300.91	150.45	42.58
HFOPM-2	Transfer to Coarse Ore Storage	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	68.70	34.35	9.72	300.91	150.45	42.58	Water spray	300.91	150.45	42.58
HFOPM-3	Transfer of Concentrate	0.87	0.35	0.10	n/a	n/a	n/a	n/a	3.80	1.52	0.43	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Wet Material	3.80	1.52	0.43
HFOPM-4	Transfer of Concentrate	2.60	1.04	0.29	n/a	n/a	n/a	n/a	11.40	4.56	1.29	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Wet Material	11.40	4.56	1.29
HFOPN-3	Transfer to Cleanup Conveyer	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.17	0.09	0.02	0.75	0.37	0.11	Enclosure	0.75	0.37	0.11
WFOPM-1	Coarse ore storage	0.02	0.01	0.00	n/a	n/a	n/a	n/a	0.07	0.04	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Wet Material	0.07	0.04	0.01
WFOPM-2	Concentrate Storage Pile	0.01	0.00	0.00	n/a	n/a	n/a	n/a	0.02	0.01	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Wet Material	0.02	0.01	0.00
N/A	PAX Usage	n/a	n/a	n/a	n/a	n/a	n/a	0.24	n/a	n/a	n/a	n/a	n/a	n/a	1.04	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a

POTENTIAL TO EMIT
CRITERIA AIR POLLUTANTS
ASARCO MISSION COMPLEX

Number	Emissions Source/Activity	Emissions (Uncontrolled)														Emissions (Controlled)						Control Device	Emissions Summary		
		PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$
	South Circuit Subtotal	0.03	0.02	0.00	0.00	0.00	0.00	0.24	0.14	0.07	0.01	0.00	0.00	0.00	1.04	195.03	98.23	30.67	383.66	197.73	68.52		383.81	197.80	68.53
SSOPS-1	Primary Crushing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.54	0.54	0.54	2.37	2.37	2.37	Dry Dust Collector	2.37	2.37	2.37
SSOPS-2	Transfer to Stacker	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.38	0.38	0.38	1.68	1.68	1.68	Wet Scrubber	1.68	1.68	1.68
SSOPS-3	(30-150A); Trans. to SAG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.32	0.32	0.32	1.41	1.41	1.41	Dry Dust Collector	1.41	1.41	1.41
SSOPS-3	(30-150B); Trans. to SAG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.32	0.32	0.32	1.41	1.41	1.41	Dry Dust Collector	1.41	1.41	1.41
SSOPS-4	Omni Cone Crusher and Bypass	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.11	1.11	1.11	4.88	4.88	4.88	Wet Scrubber	4.88	4.88	4.88
SSOPS-4A	Transf. from Intermediate stockpile	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.27	1.27	1.27	5.56	5.56	5.56	Wet Scrubber	5.56	5.56	5.56
SSOPS-6	Lime Loading	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.05	0.05	0.05	0.23	0.23	0.23	Dry Dust Collector	0.23	0.23	0.23
PFOPS-0	Transfer of Ore - Dump Pocket	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	59.40	29.70	8.41	112.50	56.25	15.92	Water sprays/encl.	112.50	56.25	15.92
HFOPS-2	Transfer Point of Crushed Ore	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	118.80	59.40	16.81	225.00	112.50	31.84	Water sprays	225.00	112.50	31.84
WFOPS-1	Coarse Ore Storage	0.02	0.01	0.00	n/a	n/a	n/a	n/a	0.10	0.05	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	None	0.10	0.05	0.01
PFOPS-8	Omnicone Circuit	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3.00	1.20	0.34	13.14	5.26	1.49	Wet process/encl.	13.14	5.26	1.49
HFOPS-3	Transfer to Inter. Ore Stockpile	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3.00	1.20	0.34	13.14	5.26	1.49	Wet process/encl.	13.14	5.26	1.49
WFOPS-2	Intermediate stockpile	0.01	0.00	0.00	n/a	n/a	n/a	n/a	0.02	0.01	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	None	0.02	0.01	0.00
HFOPS-4	Conveyer to Concentrate Stacking	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.95	0.78	0.22	0.68	0.27	0.08	Wet process/encl.	0.68	0.27	0.08
HFOPS-5	Concentrate Loading	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.88	1.95	0.55	1.69	0.68	0.19	Wet process/encl.	1.69	0.68	0.19
WFOPS-3	Concentrate Storage Pile	0.01	0.00	0.00	n/a	n/a	n/a	n/a	0.02	0.01	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Wet process/encl.	0.02	0.01	0.00
N/A	PAX Usage	n/a	n/a	n/a	n/a	n/a	n/a	0.24	n/a	n/a	n/a	n/a	n/a	n/a	1.04	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a
	By-Products Subtotal	0.04	0.04	0.04	0.48	0.57	0.00	0.03	0.19	0.19	0.19	2.10	2.50	0.02	0.14	1.31	1.31	1.31	5.74	5.74	5.74		5.93	5.93	5.93
SSMP-1	Dryer	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.31	1.31	1.31	5.74	5.74	5.74	Wet Scrubber	5.74	5.74	5.74
CFMP-1	Roasters	0.02	0.02	0.02	0.24	0.29	0.00	0.02	0.10	0.10	0.10	1.05	1.25	0.01	0.07	n/a	n/a	n/a	n/a	n/a	n/a	None	0.10	0.10	0.10
CFMP-2	Roasters	0.02	0.02	0.02	0.24	0.29	0.00	0.02	0.10	0.10	0.10	1.05	1.25	0.01	0.07	n/a	n/a	n/a	n/a	n/a	n/a	None	0.10	0.10	0.10
	Petroleum Storage Tanks Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	4.34	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
n/a	Gasoline tank (20,000 gallon)	n/a	n/a	n/a	n/a	n/a	n/a	0.76	n/a	n/a	n/a	n/a	n/a	n/a	3.31	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a
n/a	Gasoline Dispensing	n/a	n/a	n/a	n/a	n/a	n/a	0.15	n/a	n/a	n/a	n/a	n/a	n/a	0.66	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a
n/a	Diesel tank (250,000 gallon)	n/a	n/a	n/a	n/a	n/a	n/a	0.07	n/a	n/a	n/a	n/a	n/a	n/a	0.30	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a
n/a	Diesel tank (20,000 gallon)	n/a	n/a	n/a	n/a	n/a	n/a	0.01	n/a	n/a	n/a	n/a	n/a	n/a	0.02	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a
n/a	Diesel tank (20,000 gallon)	n/a	n/a	n/a	n/a	n/a	n/a	0.01	n/a	n/a	n/a	n/a	n/a	n/a	0.02	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a
n/a	Diesel tank (20,000 gallon)	n/a	n/a	n/a	n/a	n/a	n/a	0.01	n/a	n/a	n/a	n/a	n/a	n/a	0.02	n/a	n/a	n/a	n/a	n/a	n/a	None	n/a	n/a	n/a

POTENTIAL TO EMIT
CRITERIA AIR POLLUTANTS
ASARCO MISSION COMPLEX

Number	Emissions Source/Activity	Emissions (Uncontrolled)														Emissions (Controlled)						Control Device	Emissions Summary		
		PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$
	Emergency Engines Subtotal	1.14	1.14	1.14	73.84	18.40	1.48	1.82	0.57	0.57	0.57	6.03	8.40	0.74	0.91	0.00	0.00	0.00	0.00	0.00	0.00		0.57	0.57	0.57
n/a	North Mill Admin Generator	0.00	0.00	0.00	0.62	0.42	0.15	0.19	0.00	0.00	0.00	0.31	0.21	0.08	0.09	n/a	n/a	n/a	n/a	n/a	n/a	None	0.00	0.00	0.00
n/a	North Mill Thickener Generator	0.06	0.06	0.06	0.69	0.65	0.17	0.21	0.03	0.03	0.03	0.35	0.33	0.09	0.11	n/a	n/a	n/a	n/a	n/a	n/a	None	0.03	0.03	0.03
n/a	Dispatch Location Generator	0.00	0.00	0.00	0.62	0.42	0.15	0.19	0.00	0.00	0.00	0.31	0.21	0.08	0.09	n/a	n/a	n/a	n/a	n/a	n/a	None	0.00	0.00	0.00
n/a	South Mill Generator	1.07	1.07	1.07	3.26	15.13	1.00	1.23	0.54	0.54	0.54	1.63	7.57	0.50	0.61	n/a	n/a	n/a	n/a	n/a	n/a	None	0.54	0.54	0.54
n/a	South Mill Tank Hill Generator	0.00	0.00	0.00	68.65	1.77	0.00	0.01	0.00	0.00	0.00	3.43	0.09	0.00	0.00	n/a	n/a	n/a	n/a	n/a	n/a	None	0.00	0.00	0.00
	Wind Erosion Subtotal	59.29	28.04	4.25	0.00	0.00	0.00	0.00	259.69	122.83	18.60	0.00	0.00	0.00	0.00	18.45	1.01	1.01	80.80	4.44	4.44		340.49	127.27	23.04
WFDA-1	Wind Erosion - Tailings Dams	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	18.45	1.01	1.01	80.80	4.44	4.44	Chemical app.	80.80	4.44	4.44
WFDA-2	Wind Erosion--Overburden	59.29	28.04	4.25	n/a	n/a	n/a	n/a	259.69	122.83	18.60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Chemical app.	259.69	122.83	18.60

POTENTIAL TO EMIT
HAZARDOUS AIR POLLUTANT SUMMARY
ASARCO MISSION COMPLEX

Emission Point	Emissions Source/Activity	Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se	Benzene	Toluene	Xylenes	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	2-Methylnaphthalene	3-Methylchloranthrene
	TOTAL	0.00	0.01	0.00	0.00	0.02	0.01	0.02	0.62	0.00	0.00	0.00	0.21	0.60	0.60	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mining Activities: Sub-total (Fugitive & Non-Fugitive)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
OFMA-1	Drilling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OFMA-2	Blasting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CFMA-1	Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CFMA-2	Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CFMA-3	Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-1	Haulage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-2	Dozing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-3	Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-4	Rubber Tire Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-5	Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-6	Misc. Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFMA-1	Unloading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mission Circuit: Sub-total(Fugitive & Non-Fugitive)	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.01**	**0.36**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
SSOPM-1	Primary Crusher	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-2a	Transfer to Secondary (North)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-2b	Transfer to Secondary (South)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-3	(307-108A); Sec. & Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-3	(307-108B); Sec. & Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-4	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-5	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-6	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-7	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-8	Transfer Ore to Tripper Car	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-9	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-10	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-11	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-12	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-13	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-14	Transfer to Rod Mill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-15	Transfer to Rod Mill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-16	Transfer to Rod Mill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPN-6	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPN-7	Transfer to Ball Mills	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-17	Lime Conveyance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-18	Lime Transfer feeder to Conveyor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-5	Mission Mill Lime Feeder Conveyor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-1	Dump Pocket	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-2	Transfer to Coarse Ore Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-3	Transfer of Concentrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-4	Transfer of Concentrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPN-3	Transfer to Cleanup Conveyer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPM-1	Coarse ore storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPM-2	Concentrate Storage Pile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	PAX Usage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

POTENTIAL TO EMIT
HAZARDOUS AIR POLLUTANT SUMMARY
ASARCO MISSION COMPLEX

Emission Point	Emissions Source/Activity	7,12-Dimethylbenz(a)anthracene	Dichlorobenzene	Hexane	Ethylbenzene	Xylene - p	Xylelene-m	Xylene-o	MTBE	Carbon Disulfide	MDI	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,3-Dichloropropene	Total (tons/yr)
	TOTAL	0.00	0.00	0.24	0.12	0.00	0.00	0.00	0.60	2.08	0.00	0.00	0.00	0.00	5.21
	Mining Activities: Sub-total (Fugitive & Non-Fugitive)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.06**
OFMA-1	Drilling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OFMA-2	Blasting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
CFMA-1	Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CFMA-2	Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
CFMA-3	Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
VFMA-1	Haulage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-2	Dozing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-3	Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-4	Rubber Tire Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-5	Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VFMA-6	Misc. Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFMA-1	Unloading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mission Circuit: Sub-total(Fugitive & Non-Fugitive)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.04**	**0.00**	**0.00**	**0.00**	**0.00**	**1.43**
SSOPM-1	Primary Crusher	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-2a	Transfer to Secondary (North)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-2b	Transfer to Secondary (South)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-3	(307-108A); Sec. & Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-3	(307-108B); Sec. & Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-4	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-5	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-6	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-7	Secondary and Tertiary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-8	Transfer Ore to Tripper Car	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-9	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-10	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-11	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-12	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-13	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-14	Transfer to Rod Mill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-15	Transfer to Rod Mill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-16	Transfer to Rod Mill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPN-6	Transfer to Fine Ore Bin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPN-7	Transfer to Ball Mills	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-17	Lime Conveyance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-18	Lime Transfer feeder to Conveyor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-5	Mission Mill Lime Feeder Conveyor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-1	Dump Pocket	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
HFOPM-2	Transfer to Coarse Ore Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
HFOPM-3	Transfer of Concentrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-4	Transfer of Concentrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
HFOPN-3	Transfer to Cleanup Conveyer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPM-1	Coarse ore storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPM-2	Concentrate Storage Pile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	PAX Usage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	1.04

POTENTIAL TO EMIT
HAZARDOUS AIR POLLUTANT SUMMARY
ASARCO MISSION COMPLEX

Emission Point	Emissions Source/Activity	Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se	Benzene	Toluene	Xylenes	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	2-Methylnaphthalene	3-Methylchloranthrene
South Circuit: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.19**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
SSOPS-1	Primary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-2	Transfer to Stacker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-3	(30-150A); Trans. to SAG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-3	(30-150B); Trans. to SAG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-4	Omni Cone Crusher and Bypass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-4A	Intermediate stockpile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-6	Lime Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PFOPS-0	Transfer of Ore - Dump Pocket	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-2	Transfer Point of Crushed Ore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPS-1	Coarse Ore Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PFOPS-8	Omnicone Circuit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-3	Transfer to Inter. Ore Stockpile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPS-2	Intermediate stockpile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-4	Conveyer to Concentrate Stacking	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-5	Concentrate Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPS-3	Concentrate Storage Pile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	Xanthate Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind Erosion: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
WFDA-1	Tailings Dams	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFDA-2	Overburden Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moly Plant: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
SSMP-1	Dryer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CFMP-1	Roasters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CFMP-2	Roasters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tanks: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.19**	**0.60**	**0.60**	**0.00**	**0.00**	**0.00**	**0.00**	**0.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
N/A	Gasoline Storage Tank (UST)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.50	0.50	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	Gasoline Dispensing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10	0.10	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	Diesel Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Engines: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
N/A	North Mill Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	North Mill Thickener Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	Dispatch Location Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	South Mill Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	South Mill Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

POTENTIAL TO EMIT
HAZARDOUS AIR POLLUTANT SUMMARY
ASARCO MISSION COMPLEX

Emission Point	Emissions Source/Activity	7,12-Dimethylbenz(a)anthracene	Dichlorobenzene	Hexane	Ethylbenzene	Xylene - p	Xylelene-m	Xylene-o	MTBE	Carbon Disulfide	MDI	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,3-Dichloropropene	Total (tons/yr)
South Circuit: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.04**	**0.00**	**0.00**	**0.00**	**0.00**	**1.25**
SSOPS-1	Primary Crushing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-2	Transfer to Stacker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-3	(30-150A); Trans. to SAG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-3	(30-150B); Trans. to SAG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-4	Omni Cone Crusher and Bypass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-4A	Intermediate stockpile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-6	Lime Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PFOPS-0	Transfer of Ore - Dump Pocket	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
HFOPS-2	Transfer Point of Crushed Ore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
WFOPS-1	Coarse Ore Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PFOPS-8	Omnicone Circuit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
HFOPS-3	Transfer to Inter. Ore Stockpile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
WFOPS-2	Intermediate stockpile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-4	Conveyer to Concentrate Stacking	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-5	Concentrate Loading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPS-3	Concentrate Storage Pile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	Xanthate Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	1.04
Wind Erosion: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.04**
WFDA-1	Tailings Dams	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
WFDA-2	Overburden Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moly Plant: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.05**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.05**
SSMP-1	Dryer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CFMP-1	Roasters	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
CFMP-2	Roasters	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Tanks: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.20**	**0.12**	**0.00**	**0.00**	**0.00**	**0.60**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.38**
N/A	Gasoline Storage Tank (UST)	0.00	0.00	0.17	0.10	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	1.99
N/A	Gasoline Dispensing	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.40
N/A	Diesel Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Engines: Sub Total (Fugitive & Non-Fugitive)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
N/A	North Mill Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	North Mill Thickener Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	Dispatch Location Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	South Mill Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N/A	South Mill Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

POTENTIAL TO EMIT
GREENHOUSE GAS EMISSIONS
ASARCO MISSION COMPLEX

Number	Emissions Source/Activity	CO2 (ton/yr)	CH4 (ton/yr)	N2O (ton/yr)	CO2e (ton/yr)
	Facility-wide	**9,636.27**	**0.17**	**0.08**	**9,663.20**

	Mining Subtotal	6,215.50	0.10	0.02	6,223.74
OFMA-1	Drilling	n/a	n/a	n/a	n/a
OFMA-2	Blasting	n/a	n/a	n/a	n/a
CFMA-1	Generator	67.50	0.00	0.00	67.59
CFMA-2	Generator	2,320.00	0.04	0.01	2,323.47
CFMA-3	Generator	3,828.00	0.06	0.01	3,832.68
VFMA-1	Haulage	n/a	n/a	n/a	n/a
VFMA-2	Dozing	n/a	n/a	n/a	n/a
VFMA-3	Grading	n/a	n/a	n/a	n/a
VFMA-4	Rubber Tire Rigs	n/a	n/a	n/a	n/a
VFMA-5	Land Clearing	n/a	n/a	n/a	n/a
VFMA-6	Misc. Vehicles	n/a	n/a	n/a	n/a
HFMA-1	Unloading	n/a	n/a	n/a	n/a

	Mission Circuit Subtotal	0.00	0.00	0.00	0.00
SSOPM-1	Primary Crusher	n/a	n/a	n/a	n/a
SSOPM-2a	Transfer to Secondary (North)	n/a	n/a	n/a	n/a
SSOPM-2b	Transfer to Secondary (South)	n/a	n/a	n/a	n/a
SSOPM-3	(307-108A); Sec. & Tertiary Crushing	n/a	n/a	n/a	n/a
SSOPM-3	(307-108B); Sec. & Tertiary Crushing	n/a	n/a	n/a	n/a
SSOPM-4	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a
SSOPM-5	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a
SSOPM-6	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a
SSOPM-7	Secondary and Tertiary Crushing	n/a	n/a	n/a	n/a
SSOPM-8	Transfer Ore to Tripper Car	n/a	n/a	n/a	n/a
SSOPM-9	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a
SSOPM-10	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a
SSOPM-11	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a
SSOPM-12	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a
SSOPM-13	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a
SSOPM-14	Transfer to Rod Mill	n/a	n/a	n/a	n/a
SSOPM-15	Transfer to Rod Mill	n/a	n/a	n/a	n/a
SSOPM-16	Transfer to Rod Mill	n/a	n/a	n/a	n/a
SSOPN-6	Transfer to Fine Ore Bin	n/a	n/a	n/a	n/a
SSOPN-7	Transfer to Ball Mills	n/a	n/a	n/a	n/a
SSOPM-17	Lime Conveyance	n/a	n/a	n/a	n/a
SSOPM-18	Lime Transfer feeder to Conveyor	n/a	n/a	n/a	n/a
HFOPM-5	Mission Mill Lime Feeder Conveyor	n/a	n/a	n/a	n/a
HFOPM-1	Dump Pocket	n/a	n/a	n/a	n/a
HFOPM-2	Transfer to Coarse Ore Storage	n/a	n/a	n/a	n/a
HFOPM-3	Transfer of Concentrate	n/a	n/a	n/a	n/a
HFOPM-4	Transfer of Concentrate	n/a	n/a	n/a	n/a
WFOPM-1	Coarse ore storage	n/a	n/a	n/a	n/a
WFOPM-2	Concentrate Storage Pile	n/a	n/a	n/a	n/a
N/A	PAX Usage	n/a	n/a	n/a	n/a

	South Circuit Subtotal	0.00	0.00	0.00	0.00
SSOPS-1	Primary Crushing	n/a	n/a	n/a	n/a
SSOPS-2	Transfer to Stacker	n/a	n/a	n/a	n/a
SSOPS-3	(30-150A); Trans. to SAG	n/a	n/a	n/a	n/a
SSOPS-3	(30-150B); Trans. to SAG	n/a	n/a	n/a	n/a
SSOPS-4	Omni Cone Crusher and Bypass	n/a	n/a	n/a	n/a
SSOPS-4A	Transf. from Intermediate stockpile	n/a	n/a	n/a	n/a
SSOPS-6	Lime Loading	n/a	n/a	n/a	n/a
PFOPS-0	Transfer of Ore - Dump Pocket	n/a	n/a	n/a	n/a
HFOPS-2	Transfer Point of Crushed Ore	n/a	n/a	n/a	n/a
WFOPS-1	Coarse Ore Storage	n/a	n/a	n/a	n/a
PFOPS-8	Omnicone Circuit	n/a	n/a	n/a	n/a
HFOPS-3	Transfer to Inter. Ore Stockpile	n/a	n/a	n/a	n/a
WFOPS-2	Intermediate stockpile	n/a	n/a	n/a	n/a
HFOPS-4	Conveyer to Concentrate Stacking	n/a	n/a	n/a	n/a
HFOPS-5	Concentrate Loading	n/a	n/a	n/a	n/a
WFOPS-3	Concentrate Storage Pile	n/a	n/a	n/a	n/a
N/A	PAX Usage	n/a	n/a	n/a	n/a

	By-Products Subtotal	3,003.43	0.06	0.06	3,021.28
SSMP-1	Dryer	n/a	n/a	n/a	n/a
CFMP-1	Roasters	1,501.71	0.03	0.03	1,510.64
CFMP-2	Roasters	1,501.71	0.03	0.03	1,510.64

	Petroleum Storage Tanks Subtotal	0.00	0.00	0.00	0.00
n/a	Gasoline tank (20,000 gallon)	n/a	n/a	n/a	n/a
n/a	Gasoline Dispensing	n/a	n/a	n/a	n/a
n/a	Diesel tank (250,000 gallon)	n/a	n/a	n/a	n/a
n/a	Diesel tank (20,000 gallon)	n/a	n/a	n/a	n/a
n/a	Diesel tank (20,000 gallon)	n/a	n/a	n/a	n/a
n/a	Diesel tank (20,000 gallon)	n/a	n/a	n/a	n/a

	Emergency Engines Subtotal	417.35	0.02	0.00	418.18
n/a	North Mill Admin Generator	43.16	0.00	0.00	43.22
n/a	North Mill Thickener Generator	48.56	0.00	0.00	48.62
n/a	Dispatch Location Generator	43.16	0.00	0.00	43.22
n/a	South Mill Generator	281.33	0.00	0.00	281.68
n/a	South Mill Tank Hill Generator	1.13	0.01	0.00	1.45

	Wind Erosion Subtotal	0.00	0.00	0.00	0.00
WFDA-1	Wind Erosion - Tailings Dams	n/a	n/a	n/a	n/a
WFDA-2	Wind Erosion--Overburden	n/a	n/a	n/a	n/a

OFMA-1 Drilling

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Number of holes}\left(\frac{holes}{year}\right) x \text{ Emission Factor}\left(\frac{lb}{hole}\right) x \text{ Control Efficiency (\%)}\ x\frac{1}{8{,}760}\left(\frac{year}{hour}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Number of holes}\left(\frac{holes}{year}\right) x \text{ Emission Factor}\left(\frac{lb}{hole}\right) \text{ x Control Efficiency (\%)}\ x\frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

Holes Drilled =	22,750	holes/yr	
Emission Factor (TSP) =	1.30	(lb/hole)	(Reference: AP-42, Table 11.9-4, Drilling)
Emission Factor (PM_{10}) =	1.30	(lb/hole)	(Note: Assumed PM = PM_{10} = $PM_{2.5}$ to provide a conservative estimate of potential emissions)
Emission Factor ($PM_{2.5}$) =	1.30	(lb/hole)	(Note: Assumed PM = PM_{10} = $PM_{2.5}$ to provide a conservative estimate of potential emissions)
Control Efficiency (Note #1)	50%		
Annual Operating Hours =	8,760	hours	

Emissions (Controlled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
1.69	1.69	1.69	7.39	7.39	7.39

Ore Assay										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

HAP Emissions										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFMA-2 Blasting

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{blast}\right) x \text{ Number of Blasts}\left(\frac{blasts}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hour}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{blast}\right) x \text{ Number of Blasts}\left(\frac{blasts}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

$$\text{Emission Factor}\left(\frac{lb}{blast}\right) = 0.000014 \text{ x Area Blasted}^{1.5}$$

$$\text{Area Blasted}\left(\frac{ft^2}{blast}\right) = \text{Total Area Blasted}\left(\frac{ft^2}{year}\right) x \frac{1}{\text{Blasts per Year}}\left(\frac{year}{blasts}\right)$$

Holes Drilled	22,750	holes/yr
Blast Pattern (max)	1,050	ft^2 (Based on a blast area of 30 feet x 35 feet for each hole)
Blasts	375	blasts/yr
Total Area Blasted	23,887,500	ft^2/yr
Area	63,700	ft^2/blast
Annual Operating Hours	8,760	hours

Emission Factor (TSP) = 0.000014 (A)^1.5 (lb/blast) (Reference: AP-42, Table 11.9-1, Blasting Coal or Overburden)

Where: A = Area Blasted in ft^2

Emission Factor (TSP) =	225.08	lb/blast	
Emission Factor (PM_{10}) =	117.04	lb/blast	(Reference: Calculated as 0.52 * PM per in AP - 42, Table 11.9-1, Blasting Scaling Factors)
Emission Factor ($PM_{2.5}$) =	6.75	lb/blast	(Reference: Calculated as 0.03 * PM per in AP - 42, Table 11.9-1, Blasting Scaling Factors)

Emissions (Uncontrolled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	PM_{10}
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
9.64	5.01	0.29	42.20	21.95	1.27

Ore Assay										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

HAP Emissions										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00

OFMA-2 Blasting (Continued)

$$\text{Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{ton}\right) x \text{ Ammonium Nitrate}\left(\frac{ton}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hour}\right)$$

$$\text{Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{ton}\right) x \text{ Ammonium Nitrate}\left(\frac{ton}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{year}\right)$$

Ammonium Nitrate Usage =	8,224	tons/yr	
Annual Operating Hours	8,760	hours	
Emission Factor (CO) =	67	lb/ton	(Reference: AP-42 Table 13.3-1, ANFO)
Emission Factor (NOx) =	17	lb/ton	(Reference: AP-42 Table 13.3-1, ANFO)
Emission Factor (SO_2) =	2	lb/ton	(Reference: AP-42 Table 13.3-1, ANFO)

Emissions (Uncontrolled)					
CO	NO_X	SO_2	CO	NO_X	SO_2
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
62.90	15.96	1.88	275.50	69.90	8.22

$$\text{Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{hp-hr}\right) x \text{ Engine Rated Capacity}(hp)$$

$$\text{Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{hp-hr}\right) x \text{ Engine Rated Capacity}(hp) \; x \text{ Annual Operating Hours } \left(\frac{hours}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

Engine ID	Capacity	Operating Hours	Fuel Use	Fuel Use
	(hp)	(hours)	(gal/hr)	(gal/yr)
		(Note #2)		
CFMA-1	500	250	10	2,500
CFMA-2	1,000	4,000	25	100,000
CFMA-3	2,200	3,000	45	135,000

Emission Factors for CFMA-1

Criteria Pollutants (Reference: AP-42, Table 3.3-1, Diesel Fuel)

Emission Factor (NOx) =	0.031	lb/hp-hr	
Emission Factor (CO) =	6.68E-03	lb/hp-hr	
Emission Factor (SOx) =	2.05E-03	lb/hp-hr	
Emission Factor ($PM/PM_{10}/PM_{2.5}$) =	2.20E-03	lb/hp-hr	
Emission Factor (VOC) =	6.88E-03	lb/hp-hr	
Emission Factor (CO2) =	1.08	lb/hp-hr	
Emission Factor (CH4) =	6.60E-03	lb/MMBtu	(Reference: 40 CFR Part 98, Subpart C, Table C-2)
Emission Factor (N2O) =	1.32E-03	lb/MMBtu	(Reference: 40 CFR Part 98, Subpart C, Table C-2)

HAPs (Reference: AP-42, Table 3.3-2)

Emission Factor (Benzene) =	9.33E-04	lb/MMBtu
Emission Factor (Toluene) =	4.09E-04	lb/MMBtu
Emission Factor (Xylenes) =	2.85E-04	lb/MMBtu
Emission Factor (Butadiene) =	3.91E-05	lb/MMBtu
Emission Factor(Formaldehyde) =	1.18E-03	lb/MMBtu
Emission Factor (Acetaldehyde) =	7.67E-04	lb/MMBtu
Emission Factor (Acrolein) =	9.25E-05	lb/MMBtu
Emission Factor (Naphthalene) =	8.48E-05	lb/MMBtu
Emission Factor (Acenaphthylene) =	5.06E-06	lb/MMBtu
Emission Factor (Acenaphthene) =	1.42E-06	lb/MMBtu
Emission Factor (Fluorene) =	2.92E-05	lb/MMBtu
Emission Factor (Phenanthrene) =	2.94E-05	lb/MMBtu
Emission Factor (Anthracene) =	1.87E-06	lb/MMBtu
Emission Factor (Fluoranthene) =	7.61E-06	lb/MMBtu
Emission Factor (Pyrene) =	4.78E-06	lb/MMBtu
Emission Factor (Benz(a)anthracene) =	1.68E-06	lb/MMBtu
Emission Factor (Chrysene) =	3.53E-07	lb/MMBtu
Emission Factor (Benzo(b)fluoranthene) =	9.91E-08	lb/MMBtu
Emission Factor (Benzo(k)fluoranthene) =	1.55E-07	lb/MMBtu
Emission Factor (Benzo(a)pyrene) =	1.88E-07	lb/MMBtu
Emission Factor (Indeno(1,2,3-cd)pyrene) =	3.75E-07	lb/MMBtu
Emission Factor (Dibenz(a,h)anthracene) =	5.83E-07	lb/MMBtu
Emission Factor (Benzo(g,h,l)perylene) =	4.89E-07	lb/MMBtu

Emission Factors for CFMA-2 and CFMA-3

Criteria Pollutants (Reference: AP-42, Table 3.4-1, Diesel Fuel)

Emission Factor (NOx) =	0.0240	lb/hp-hr	
Emission Factor (CO) =	5.5E-03	lb/hp-hr	
Emission Factor (SOx) =	8.09E-03	lb/hp-hr	
Emission Factor ($PM/PM_{10}/PM_{2.5}$) =	0.0007	lb/hp-hr	
Emission Factor (VOC) =	7.05E-04	lb/hp-hr	
Emission Factor (CO2) =	1.16	lb/hp-hr	
Emission Factor (CH4) =	6.60E-03	lb/MMBtu	(Reference: 40 CFR Part 98, Subpart C, Table C-2)
Emission Factor (N2O) =	1.32E-03	lb/MMBtu	(Reference: 40 CFR Part 98, Subpart C, Table C-2)

HAPs (Reference: AP-42, Table 3.4-3)

Emission Factor (Benzene) =	7.76E-04	lb/MMBtu
Emission Factor (Toluene) =	2.81E-04	lb/MMBtu
Emission Factor (Xylenes) =	1.93E-04	lb/MMBtu
Emission Factor(Formaldehyde) =	7.89E-05	lb/MMBtu
Emission Factor (Acetaldehyde) =	2.52E-05	lb/MMBtu
Emission Factor (Acrolein) =	7.88E-06	lb/MMBtu
Emission Factor (Naphthalene) =	1.30E-04	lb/MMBtu
Emission Factor (Acenaphthylene) =	9.23E-06	lb/MMBtu
Emission Factor (Acenaphthene) =	4.68E-06	lb/MMBtu
Emission Factor (Fluorene) =	1.28E-05	lb/MMBtu
Emission Factor (Phenanthrene) =	4.08E-04	lb/MMBtu
Emission Factor (Anthracene) =	1.23E-06	lb/MMBtu
Emission Factor (Fluoranthene) =	4.03E-06	lb/MMBtu
Emission Factor (Pyrene) =	3.71E-06	lb/MMBtu
Emission Factor (Benz(a)anthracene) =	6.22E-07	lb/MMBtu
Emission Factor (Chrysene) =	1.53E-06	lb/MMBtu
Emission Factor (Benzo(b)fluoranthene) =	1.11E-06	lb/MMBtu
Emission Factor (Benzo(k)fluoranthene) =	2.18E-07	lb/MMBtu
Emission Factor (Benzo(a)pyrene) =	2.57E-07	lb/MMBtu
Emission Factor (Indeno(1,2,3-cd)pyrene) =	4.14E-07	lb/MMBtu
Emission Factor (Dibenz(a,h)anthracene) =	3.46E-07	lb/MMBtu
Emission Factor (Benzo(g,h,l)perylene) =	5.56E-07	lb/MMBtu

CFMA-1, CFMA -2, and CFMA-3 Generators (Continued)

Diesel Heating Value = 124,238 Btu/gal

Emission Unit	Emissions (Uncontrolled)									
	NOx	CO	SO_X	$PM/PM_{10}/PM_{2.5}$	VOC	NO_X	CO	SOx	$PM/PM_{10}/PM_{2.5}$	VOC
	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/year)	(ton/year)	(ton/year)	(ton/year)	(ton/year)
CFMA-1	15.50	3.34	1.03	1.10	3.44	1.94	0.42	0.13	0.14	0.43
CFMA-2	24.00	5.50	8.09	0.70	0.71	48.00	11.00	16.18	1.40	1.41
CFMA-3	52.80	12.10	17.80	1.54	1.55	79.20	18.15	26.70	2.31	2.33
Subtotal	92.30	20.94	26.91	3.34	5.70	129.14	29.57	43.01	3.85	4.17

Emission Unit	Emissions (Uncontrolled)			
	CO2	CH4	N2O	CO2e
	(ton/year)	(ton/year)	(ton/year)	(ton/year)
CFMA-1	67.50	0.00	0.00	67.59
CFMA-2	2,320.00	0.04	0.01	2323.47
CFMA-3	3,828.00	0.06	0.01	3832.68
Subtotal	6215.50	0.10	0.02	6223.74

CFMA-1, CFMA -2, and CFMA-3 Generators (Continued)

Pollutant	Emissions (Uncontrolled)		
	CFMA-1	CFMA-2	CFMA-3
	(ton/yr)	(ton/yr)	(ton/yr)
Benzene	0.00	4.82E-03	6.51E-03
Toluene	0.00	1.75E-03	2.36E-03
Xylenes	0.00	1.20E-03	1.62E-03
1,3-Butadiene	0.00	n/a	n/a
Formaldehyde	0.00	4.90E-04	6.62E-04
Acetaldehyde	0.00	1.57E-04	2.11E-04
Acrolein	0.00	4.89E-05	6.61E-05
Naphthalene	0.00	8.08E-04	1.09E-03
Acenaphthylene	0.00	5.73E-05	7.74E-05
Acenaphthene	0.00	2.91E-05	3.92E-05
Fluorene	0.00	7.95E-05	1.07E-04
Phenanthrene	0.00	2.53E-03	3.42E-03
Anthracene	0.00	7.64E-06	1.03E-05
Fluoranthene	0.00	2.50E-05	3.38E-05
Pyrene	0.00	2.30E-05	3.11E-05
Benz(a)anthracene	0.00	3.86E-06	5.22E-06
Chrysene	0.00	9.50E-06	1.28E-05
Benzo(b)fluoranthene	0.00	6.90E-06	9.31E-06
Benzo(k)fluoranthene	0.00	1.35E-06	1.83E-06
Benzo(a)pyrene	0.00	1.60E-06	2.16E-06
Indeno(1,2,3-cd)pyrene	0.00	2.57E-06	3.47E-06
Dibenz(a,h)anthracene	0.00	2.15E-06	2.90E-06
Benzo(g,h,l)perylene	0.00	3.45E-06	4.66E-06
Subtotal	0.00	0.01	0.02

VFMA-1 Haulage

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{vehicle\ miles\ travelled}\right) x\ V\text{vehicle Miles Travelled}\left(\frac{miles}{year}\right) x\left(\frac{1}{8{,}760}\right)\left(\frac{year}{hours}\right) x\ (1 - \text{Control Efficiency (\%)})$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{vehicle\ miles\ travelled}\right) x\ V\text{vehicle Miles Travelled}\left(\frac{miles}{year}\right) x\left(\frac{1}{2{,}000}\right)\left(\frac{ton}{pound}\right) x\ (1 - \text{Control Efficiency (\%)})$$

PM and PM_{10} Emission Factor (lb/VMT) = k(s/12)^a*(W/3)^b *[365-P)/365] (Reference: AP-42, Section 13.2.2 Unpaved Roads)

Where

	TSP	PM10	PM2.5
k =	4.9	1.5	0.15
a =	0.7	0.9	0.9
b =	0.45	0.45	0.45

s, surface material silt content (%) =	8.3	%	(Reference: AP-42, Table 13.2.2-1, Stone Quarrying and Processing)
P, days in year with at least 0.01 in. of precipitation =	0	days/yr	(See Note #3)
Average Mean Vehicle Weight (W) =	400	ton	(See Note #4)
Vehicle Miles Travelled (VMT) =	1,000,000	mile/yr	
Road Watering Control Efficiency =	75%		(See Note #5)

Emission Factor (PM) =	34.23	lb/VMT
Emission Factor (PM_{10}) =	9.73	lb/VMT
Emission Factor ($PM_{2.5}$) =	0.97	lb/VMT

Emissions (Controlled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
976.75	277.75	27.78	4,278.15	1,216.55	121.66

VFMA-2 Dozing

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{hr}\right) x \text{ Annual Operating Hours}\left(\frac{hours}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pounds}\right)$$

Emission Factor (TSP) =	5.7(s)^1.2/(M)^1.3		(Ref: AP-42, Table 11.9-1, Bulldozing Overburden)
s, Silt Content of Road =	8.3	%	(Reference: AP-42, Table 13.2.2-1, Stone Quarrying and Processing)
M, Moisture Content =	3.5	%	
Hours of Dozing	35,000	hr/yr	
Emission Factor (PM) =	14.17	lb/hr	
Emission Factor (PM_{10}) =	10.63	lb/hr	(Reference: PM_{10} is 0.75 * PM, AP-42, Table 11.9-1, Overburden)
Emission Factor ($PM_{2.5}$) =	1.49	lb/hr	(Reference: $PM_{2.5}$ is 0.105 * PM, AP-42, Table 11.9-1, Overburden)

Emissions (Uncontrolled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
14.17	10.63	1.49	248.04	186.03	26.04

VFMA-3 Grading

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{mile}\right) x \text{ Annual Miles Travelled}\left(\frac{miles}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hours}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{mile}\right) x \text{ Annual Miles Travelled}\left(\frac{miles}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

Emission Factor in lb/VMT (TSP) =	0.040*(S^2.5)		(Reference: AP-42, Table 11.9-1, Grading)
S, Mean Vehicle Speed	5	mph	
Blading Hours	20,000	hours/yr	
Annual Miles Travelled (VMT)	100,000	miles/yr	
Annual Operating Hours =	8,760	hours/yr	
Emission Factor (PM) =	2.24	lb/mile	
Emission Factor (PM_{10}) =	1.34	lb/mile	(Reference: PM_{10} is 0.6 * PM, AP-42, Table 11.9-1, Grading)
Emission Factor ($PM_{2.5}$) =	0.07	lb/mile	(Reference: $PM_{2.5}$ is 0.031 * PM, AP-42, Table 11.9-1, Grading)

Emissions (Uncontrolled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	PM_{10}
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
25.5	15.3	0.8	111.8	67.1	3.5

VFMA-4 Rubber Tire Rigs

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{hour}\right) x \text{ Annual Hours Operated}\left(\frac{hours}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hours}\right)$$

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{miles\ travelled}\right) x \text{ Annual Miles Travelled}\left(\frac{miles}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hours}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{hour}\right) x \text{ Annual Hours Operated}\left(\frac{hours}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{miles\ travelled}\right) x \text{ Annual Miles Travelled}\left(\frac{miles}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

PM and PM_{10} Emission Factor (lb/VMT) = k(s/12)^a*(W/3)^b *[365-P)/365] (Reference: AP-42, Section 13.2.2 Unpaved Roads)

Where

	TSP	PM10	PM2.5
k =	4.9	1.5	0.15
a =	0.7	0.9	0.9
b =	0.45	0.45	0.45

s, surface material silt content (%) =	8.3	%	(Reference: AP-42, Table 13.2.2-1, Stone Quarrying and Processing)
P, days in year with at least 0.01 in. of precipitation =	0	days/year	(See Note #3)
Average Mean Vehicle Weight (W) =	60		(See Note #6)
Vehicle Miles Travelled (VMT) =	300,000	mile/yr	(Dozers, excavators, backhoes, water trucks, etc.)
Road Watering Control Efficiency =	75%		(See Note #5)

Emission Factor (PM) =	14.57	lb/VMT
Emission Factor (PM_{10}) =	4.14	lb/VMT
Emission Factor ($PM_{2.5}$) =	0.41	lb/VMT

Emissions (Controlled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	PM_{10}
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
124.8	35.5	3.5	546.5	155.4	15.5

VFMA-5 Land Clearing

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{ton}\right) x \text{ Top Soil Removed}\left(\frac{ton}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hours}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{ton}\right) x \text{ Top Soil Removed}\left(\frac{ton}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

Topsoil Removed by Scraper =	1,000,000	tons/yr
Topsoil Unloaded by Scraper =	1,000,000	tons/yr

Emission Factor, Scraper (PM) =	0.058	lb/ton	(Reference: AP-42, Table 11.9-4, Topsoil Removal by Scraper)
Emission Factor, Scraper (PM_{10}) =	0.058	lb/ton	(Reference: No PM_{10} emission factor available. PM_{10} is conservatively assumed to be equal to PM)
Emission Factor, Scraper ($PM_{2.5}$) =	0.058	lb/ton	(Reference: No $PM_{2.5}$ emission factor available. $PM_{2.5}$ is conservatively assumed to be equal to PM)
Emission Factor, Unloading (TSP) =	0.04	lb/ton	(Reference: AP-42, Table 11.9-4, Scraper Unloading)
Emission Factor, Unloading (PM_{10}) =	0.04	lb/ton	(Reference: No PM_{10} emission factor available. PM_{10} is conservatively assumed to be equal to PM)
Emission Factor, Unloading ($PM_{2.5}$) =	0.04	lb/ton	(Reference: No $PM_{2.5}$ emission factor available. $PM_{2.5}$ is conservatively assumed to be equal to PM)

	Emissions (Uncontrolled)					
	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
Topsoil Removal	6.62	6.62	6.62	29.00	29.00	29.00
Topsoil Unloading	4.57	4.57	4.57	20.00	20.00	20.00
Subtotal	11.19	11.19	11.19	49.00	49.00	49.00

VFMA-6 Miscellaneous Vehicle Traffic

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{miles\ travelled}\right) x\ \text{Annual Miles Travelled}\left(\frac{miles}{year}\right) x\frac{1}{8{,}760}\left(\frac{year}{hours}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{miles\ travelled}\right) x\ \text{Annual Miles Travelled}\left(\frac{miles}{year}\right) x\frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

PM and PM_{10} Emission Factor (lb/VMT) = k(s/12)^a*(W/3)^b *[365-P)/365] (Reference: AP-42, Section 13.2.2 Unpaved Roads)

Where

	TSP	PM10	PM2.5
k =	4.9	1.5	0.15
a =	0.7	0.9	0.9
b =	0.45	0.45	0.45

s, surface material silt content (%) =	8.3	%	(Reference: AP-42, Table 13.2.2-1, Stone Quarrying and Processing)
P, days in year with at least 0.01 in. of precipitation =	0	days/year	(See Note #3)
Average Mean Vehicle Weight (W) =	2	tons	
Vehicle Miles Travelled (VMT) =	1,500,000	miles/yr	
Control Efficiency (Road Watering)	75%		(See Note #5)

Emission Factor (PM) =	3.15	lb/VMT
Emission Factor (PM_{10}) =	0.90	lb/VMT
Emission Factor ($PM_{2.5}$) =	0.09	lb/VMT

Emissions (Controlled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
135.0	38.4	3.8	591.4	168.2	16.8

HFMA-1 Unloading Overburden

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{lb}{ton}\right) x\ \text{Overburden Removed}\left(\frac{ton}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hours}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{lb}{ton}\right) x\ \text{Overburden Removed}\left(\frac{ton}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

Emission Factor for Unloading = k*(0.0032)*((U/5)^1.3/(M/2)^1.4) (Reference: AP-42, Section 13.2.4.3)

Where:

k, Particle size Multiplier for TSP = 0.74

k, Particle size Multiplier for PM_{10} = 0.35

k, Particle size Multiplier for $PM_{2.5}$ = 0.053

U = Mean Wind Speed 10 miles/hr (see Note #7)

M = Moisture Content (%) 2.6 %

Overburden Unloaded 24,804,200 tons/yr

Emission Factor (TSP) = 0.00297 lb/ton

Emission Factor (PM_{10}) = 0.00140 lb/ton

Emission Factor ($PM_{2.5}$) = 0.00021 lb/ton

Emissions (Uncontrolled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
8.40	3.97	0.60	36.79	17.40	2.63

Footnotes

Note #1 - Dust shields and water suppression are used at the facility to control dust emissions from drilling activities. Per NIOSH, "Handbook for Dust Control in Mining," the use of water suppression during drilling activities has demonstrated control efficiencies from 9.1% to 96.3%. The use of 50% provides a conservative control efficiency for the drilling activity.

Note #2 - Operating hours for CFMA-1, 2, and 3 represent the annual operating time spent by these portable engines as a replacement to existing stationary engines.

Note #3 - The mine receives, on average 50 - 60 days of precipitation above 0.01". However, for developing a PTE for the site, 0 days of precipitation above 0.01" is assumed to provide a conservative estimate of the annual emissions from the haul road.

Note #4 - The mine operates haul trucks with average mean vehicles ranging from 300 ton - 400 ton. For the purposes of this PTE, the a conservative estimate of 400 ton is used for the mean vehicle weight.

Note #5 - The control efficiency was estimated using calculations found in the "Watering and Control Efficiency" technical paper published in the Technology Transfer Network (TTN) based upon the control efficiency/moisture ratio established in AP-42 Figure 13.2.2-2 This 75% control efficiency is consistent with the watered road control efficiency accepted by Maricopa County.

Note #6 - The mine operates rubber tire rigs (dozers, excavators, water trucks, etc.) with average mean vehicles ranging from 40 ton - 60 ton. For the purposes of this PTE, the a conservative estimate of 60 ton is used for the mean vehicle weight.

Note #7 - The annual average wind speed for the site ranges from about 6 mph to 7 mph. This PTE estimate uses 10 mph as a the average annual wind speed to provide a conservative estimate of the emissions.

Calculation Methodology

A. Scrubbers and Baghouses

1. Annual Emission $\left(\frac{ton}{year}\right)$ = Emission Factor $\left(\frac{pound}{ton}\right)$ x Annual Throughput $\left(\frac{ton}{year}\right)$ $x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$

2. Annual Emission $\left(\frac{ton}{year}\right)$ = Emission Factor $\left(\frac{pound}{hour}\right)$ x 8,760 $\left(\frac{hours}{year}\right)$ $x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$

B. Transfer Points

3. Annual Emission $\left(\frac{ton}{year}\right)$ = Emission Factor $\left(\frac{pound}{ton}\right)$ x Annual Throughput $\left(\frac{ton}{year}\right)$ $x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$ x (1 − Control Efficiency)(%)

4 Annual Emission $\left(\frac{ton}{year}\right)$ = Emission Factor $\left(\frac{pound}{ton}\right)$ x Daily Throughput $\left(\frac{ton}{day}\right)$ $x \frac{1}{24}\left(\frac{day}{hour}\right)$ x 8,760 $\left(\frac{hour}{year}\right)$ $x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$ x (1 − Control Efficiency)(%)

C. CS2 Emissions from Xanthate Usage

5. Annual Emission $\left(\frac{ton}{year}\right)$ = Annual PAX Usage $\left(\frac{pound}{year}\right)$ x Decomposition Rate of PAX(%) x Molar Mass Ratio of CS2 to Pax $\left(\frac{g/gmol}{g/gmol}\right)$ $x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$

Operational Information

Mission Circuit Ore Throughput =	2,290	ton/hr
Mission Circuit Ore Throughput =	20,060,400	ton/yr
Annual Lime Throughput =	28,470	ton/yr
Copper Concentrate Produced =	760,000	ton/yr
Annual Operating Hours =	8,760	hr/yr

Emission Unit	Emission Rate	Exhaust Flow	Emission Rate					
			PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
	(gr/dscf)	(scfm)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
SSOPM-1 (Note #1)	0.004	41,503	1.55	1.55	1.55	6.81	6.81	6.81
SSOPM-2 (305-07a) (Note #2)	0.022	11,000	2.06	2.06	2.06	9.02	9.02	9.02
SSOPM-2 (305-07b) (Note #2)	0.022	11,000	2.06	2.06	2.06	9.02	9.02	9.02
SSOPM-3 (307-108A) (Note #3)	0.022	10,000	1.87	1.87	1.87	8.20	8.20	8.20
SSOPM-3 (307-108B) (Note #3)	0.022	10,000	1.87	1.87	1.87	8.20	8.20	8.20
SSOPM-4 (Note #4)	0.002	42,000	0.72	0.72	0.72	3.15	3.15	3.15
SSOPM-5 (Note #4)	0.002	42,000	0.72	0.72	0.72	3.15	3.15	3.15
SSOPM-6 (Note #4)	0.002	42,000	0.72	0.72	0.72	3.15	3.15	3.15
SSOPM-7 (Note #4)	0.002	42,000	0.72	0.72	0.72	3.15	3.15	3.15
SSOPM-8 (Note #5)	0.022	7,500	1.40	1.40	1.40	6.15	6.15	6.15
SSOPM-9 (Note #5)	0.022	2,750	0.52	0.52	0.52	2.26	2.26	2.26
SSOPM-10 (Note #5)	0.022	2,750	0.52	0.52	0.52	2.26	2.26	2.26
SSOPM-11 (Note #5)	0.022	2,750	0.52	0.52	0.52	2.26	2.26	2.26
SSOPM-12 (Note #5)	0.022	2,750	0.52	0.52	0.52	2.26	2.26	2.26
SSOPM-13 (Note #5)	0.022	2,750	0.52	0.52	0.52	2.26	2.26	2.26
SSOPM-14	0.01	17,500	1.50	1.50	1.50	6.57	6.57	6.57
SSOPM-15	0.01	17,500	1.50	1.50	1.50	6.57	6.57	6.57
SSOPM-16	0.01	17,500	1.50	1.50	1.50	6.57	6.57	6.57
SSOPN-6	0.02	6,312	1.18	1.18	1.18	5.18	5.18	5.18
SSOPN-7	0.02	16,899	3.16	3.16	3.16	13.86	13.86	13.86
		Subtotal	25.13	25.13	25.13	110.06	110.06	110.06

Ore Assay										
Sb (mg/kg)	As (mg/kg)	Be (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Pb (mg/kg)	Mn (mg/kg)	Hg (mg/kg)	Ni (mg/kg)	Se (mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

Emission Unit	(ton/yr)										
	Sb (ton/yr)	As (ton/yr)	Be (ton/yr)	Cd (ton/yr)	Cr (ton/yr)	Co (ton/yr)	Pb (ton/yr)	Mn (ton/yr)	Hg (ton/yr)	Ni (ton/yr)	Se (ton/yr)
SSOPM-1 (Note #1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-2 (305-07a) (Note #2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-2 (305-07b) (Note #2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-3 (307-108A) (Note #3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-3 (307-108B) (Note #3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-4 (Note #4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-5 (Note #4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-6 (Note #4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-7 (Note #4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-8 (Note #5)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-9 (Note #5)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-10 (Note #5)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-11 (Note #5)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-12 (Note #5)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-13 (Note #5)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPM-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPN-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPN-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00

Source - SSOPM-17
Description - Lime Transfer

Lime Throughput	28,470	tons/yr	
Emission Factor (TSP) =	2.2	lb/ton	(Reference: AP-42, Table 11.17-4, Product Transfer and Conveying)
Emission Factor (PM_{10}) =	2.2	lb/ton	(Reference: PM10 is assumed to be equal to PM as AP-42, Table 11.17-4, has no data available)
Emission Factor ($PM_{2.5}$) =	2.2	lb/ton	(Reference: No data available. Assumed $PM_{2.5} = PM_{10}$)
Number of Transfer Points SSOPM-17	2		
Control Efficiency (Baghouse 328-E6) =	99%		

Source - SSOPM-18
Description - Lime Transfer from 328-E44 to 328-E11, and 328-E11 to 328-E14

Lime Throughput	28,470	tons/yr	
Emission Factor (TSP) =	2.2	lb/ton	(Reference: AP-42, Table 11.17-4, Product Transfer and Conveying)
Emission Factor (PM_{10}) =	2.2	lb/ton	(Reference: PM10 is assumed to be equal to PM as AP-42, Table 11.17-4, has no data available)
Emission Factor ($PM_{2.5}$) =	2.2	lb/ton	(Reference: No data available. Assumed $PM_{2.5} = PM_{10}$)
Number of Transfer Points SSOPM-18	2		
Control Efficiency (Baghouse 328-E6) =	99%		

Source - HFOPM-5
Description - Mission Mill Lime Feeder Conveyor

Lime Throughput	28,470	tons/yr	
Emission Factor (TSP) =	2.2	lb/ton	(Reference: AP-42, Table 11.17-4, Product Transfer and Conveying)
Emission Factor (PM_{10}) =	2.2	lb/ton	(Reference: PM10 is assumed to be equal to PM as AP-42, Table 11.17-4, has no data available)
Emission Factor (PM_{10}) =	2.2	lb/ton	(Reference: PM2.5 is assumed to be equal to PM as AP-42, Table 11.17-4, has no data available)
Number of Transfer Point =	2	(Controlled by Enclosure)	
Number of Transfer Point =	1	(Controlled by Baghouse)	
Controlled with enclosure =	70%		
Control Efficiency (Baghouse 328-E6) =	99%		

Source - HFOPM-1
Description - Dump Pocket

Annual Ore Throughput	20,060,400	ton/yr	
Emission Factor (TSP) =	0.12	lb/ton	(Reference: AP-42, Table 11.24-2, Low Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.06	lb/ton	(Reference: AP-42, Table 11.24-2, Low Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.02	lb/ton	(Reference: $PM_{2.5}$ is assumed to be 28.6% of PM_{10})
Controlled with water sprays/dust suppressant =	75%		

Source - HFOPM-2
Description - Transfer Point of Crushed Ore to the Coarse Ore Stockpile

Ore Throughput	20,060,400	ton/yr	
Emission Factor (TSP) =	0.12	lb/ton	(Reference: AP-42, Table 11.24-2, Low Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.06	lb/ton	(Reference: AP-42, Table 11.24-2, Low Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.02	lb/ton	(Reference: $PM_{2.5}$ is assumed to be 28.6% of PM_{10})
Controlled with water sprays/dust suppressant =	75%		

Source - HFOPM-3
Description - Transfer Point of Concentrate Prodouct Into Rail Cars at Concentrate Loading Area East

Conc. Prod. Throughput	760,000	ton/yr	
Emission Factor (TSP) =	0.01	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.004	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.001	lb/ton	(Reference: $PM_{2.5}$ is assumed to be 28.6% of PM_{10})
Number of Transfer Points =	1		

Source - HFOPM-4
Description - Transfer Point of Conc. Prod at Concentrate Loading Area North. Transfer points included are:
(1) Transfer of concentrate from conveyer belt into haul truck
(2) Transfer of concentrate from the haul truck to concrete pad
(3) Loading of concentrate from concrete pad into semi truck for offsite transfer

Ore Throughput	760,000	ton/yr	
Emission Factor (TSP) =	0.01	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.004	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.001	lb/ton	(Reference: $PM_{2.5}$ is assumed to be 28.6% of PM_{10})
Number of Transfer Points =	3		

Source - HFOPN-3
Description - Transfer of Ore to Cleanup Conveyer 311-96a

Ore Throughput	41,600	ton/yr	
Emission Factor (TSP) =	0.12	lb/ton	(Reference: AP-42, Table 11.24-2, Low Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.06	lb/ton	(Reference: AP-42, Table 11.24-2, Low Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.017	lb/ton	(Reference: $PM_{2.5}$ is assumed to be 28.6% of PM_{10})
Controlled with Enclosure =	70%		

Source - WFOPM-1
Description - Coarse ore storage

Emission Factor (TSP) =	1.7 * (s/1.5) * (f/15)		(WRAP, Section 9.3)
Where			
s, silt content of material (weight %) =	4.3		(Reference: AP-42, Table 13.2.4-1, Pellet Ore)
f, % of time the wind speed > 12 mph =	100		(See Note #6)
Emission Factor (TSP) =	32.49	lb/year/acre	
Emission Factor (PM_{10}) =	16.24	lb/year/acre	
Emission Factor ($PM_{2.5}$) =	2.44	lb/year/acre	
Stockpile Height =	50	ft	(Reference: Google Earth©)
Stockpile Radius =	175	ft	(Reference: Google Earth©)
Stockpile Surface Area =	196,298	ft2	
Stockpile Surface Area =	5	acres	

Source - WFOPM-2
Description - Concentrate Storage Pile (Wind Erosion)

Emission Factor (TSP) =	1.7 * (s/1.5) * (f/15)		(WRAP, Section 9.3)
Where			
s, silt content of material (weight %) =	4.3		(Reference: AP-42, Table 13.2.4-1, Pellet Ore)
f, % of time the wind speed > 12 mph =	100		(See Note #6)
Emission Factor (TSP) =	32.49	lb/year/acre	
Emission Factor (PM_{10}) =	16.24	lb/year/acre	
Emission Factor ($PM_{2.5}$) =	2.44	lb/year/acre	
Stockpile Height =	25	ft	(Reference: Google Earth©)
Stockpile Radius =	100	ft	(Reference: Google Earth©)
Stockpile Surface Area =	63,807	ft2	
Stockpile Surface Area =	1	acres	

Emission Unit	Emissions (Uncontrolled)						Emissions (Controlled)					
	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
SSOPM-17	n/a	n/a	n/a	n/a	n/a	n/a	0.14	0.14	0.14	0.63	0.63	0.63
SSOPM-18	n/a	n/a	n/a	n/a	n/a	n/a	0.14	0.14	0.14	0.63	0.63	0.63
HFOPM-5	n/a	n/a	n/a	n/a	n/a	n/a	4.36	4.36	4.36	19.10	19.10	19.10
HFOPM-1	n/a	n/a	n/a	n/a	n/a	n/a	68.70	34.35	9.72	300.91	150.45	42.58
HFOPM-2	n/a	n/a	n/a	n/a	n/a	n/a	68.70	34.35	9.72	300.91	150.45	42.58
HFOPM-3	0.87	0.35	0.10	3.80	1.52	0.43	n/a	n/a	n/a	n/a	n/a	n/a
HFOPM-4	2.60	1.04	0.29	11.40	4.56	1.29	n/a	n/a	n/a	n/a	n/a	n/a
HFOPN-3	n/a	n/a	n/a	n/a	n/a	n/a	0.17	0.09	0.02	0.75	0.37	0.11
WFOPM-1	0.02	0.01	0.00	0.07	0.04	0.01	n/a	n/a	n/a	n/a	n/a	n/a
WFOPM-2	0.01	0.00	0.00	0.02	0.01	0.00	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal	3.49	1.40	0.39	15.30	6.13	1.73	142.22	73.43	24.11	622.92	321.64	105.62

Ore Assay										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

Emission Unit	HAP Emissions										
	Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
HFOPM-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00
HFOPM-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00
HFOPM-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPM-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
HFOPN-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPM-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPM-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.31	0.00	0.00	0.00

Source - Mission Concentrator

Quantity of PAX Used in the Mission Circuit = 700,000 lb
Quantity of PAX Used in the Mission Circuit = 350 ton

Decomposition rate of PAX = 1.58% (See Note #7)
Mole ratio of CS2 to PAX (Decomposition Coefficient) = 0.50

Note: It is assumed that 3 moles of CS2 are formed for every sixmoles of PAX that decompose:
6ROCS2- + 3H2O ---> 6ROH + CO3(2-) + 3CS2 + 2CS3(2-)

Molecular weight of PAX = 202.4 gram/gram-mol
Molecular weight of CS2 = 76.14 gram/gram-mol

Quantity of CS2 Formed = 2,080.31 lb
Quantity of CS2 Formed = 0.24 lb/hr (Annual Average)
Quantity of CS2 Formed = 1.04 ton

Footnotes:

Note #1 - SSOPM-1 is limited to an emission rate of 0.01 grams/dscm (Condition Part B, Section 1, I.B.1). This emission rate is converted to grains/dscf, as follows, to support the emissions calculations.

Permitted emission rate =	0.01	grams/dscm
1 gram =	15.43	grains
1 cubic meter =	35.31	cubic feet
Permitted emission rate =	0.0043699	grains/dscf

Note #2 - SSOPM-2 is limited to an emission rate of 0.05 grams/dscm (Condition Part B, Section 1, I.B.2). This emission rate is converted to grains/dscf, as follows, to support the emissions calculations.

Permitted emission rate =	0.05	grams/dscm
1 gram =	15.43	grains
1 cubic meter =	35.31	cubic feet
Permitted emission rate =	0.022	grains/dscf

Note #3 - SSOPM-3 is limited to an emission rate of 0.05 grams/dscm (Condition Part B, Section 2, I.B.1). This emission rate is converted to grains/dscf, as follows, to support the emissions calculations.

Permitted emission rate =	0.05	grams/dscm
1 gram =	15.43	grains
1 cubic meter =	35.31	cubic feet
Permitted emission rate =	0.022	grains/dscf

Note #4 - The emission rate used for SSOPM-4 through SSOPM-7 is 0.002 grain/dscf. Although Condition Part B, Section 2, I.B.1 of the permit limits the emission rate to 0.05 grams/dscm, Asarco submitted an application to PDEQ limiting the exhaust particulate emission rate of SSOPM4 through 7 to 0.002 grains/dscf. Note that Asarco is required to operate only three of the four control devices at all times. For the purposes of this PTE, emissions from all four control devices are included and is therefore considered conservative.

Note #5 - SSOPM-3 is limited to an emission rate of 0.05 grams/dscm (Condition Part B, Section 3, I.B.1.a). This emission rate is converted to grains/dscf, as follows, to support the emissions calculations.

Permitted emission rate =	0.05	grams/dscm
1 gram =	15.43	grains
1 cubic meter =	35.31	cubic feet
Permitted emission rate =	0.022	grains/dscf

Note #6 - The annual average wind speed for the site ranges from about 6 mph to 7 mph. For the purposes of developing an emission factor for the PTE average wind greater than 12 mph are assumed for a 100 percent of the time to provide a conservative estimate.

Note #7 -

(1) CS2 emissions are estimated using the emissions calculation methods provided in "Stationary and Mobile Source Emission Calculations for the NorthMet Project – Combined Report (RS57) PolyMet Mining Inc, November 2008.

(2) CS2 emissions are estimated by considering the annual usage of PAX powder (lb/year) and the decomposition rate for PAX when in solution

(3) Decomposition of PAX in solution and hence formation of CS2 is dependent on a number of factors , including temperature and pH. A higher pH results in a reduced decomposition rate of the PAX while the rate of decomposition increases with increasing temperature. Mission Mine's floatation systems at both the North and South Mills are operated at a relative high pH (10 -11) and ambient temperatures (around 25 C). It is known that in acidic solution xanthate decomposes to carbon disulfide and fresh xanthate solutions are neutral. Under these conditions the formation of CS2 is greatly reduced . Therefore, CS2 emissions estimated above are conservative.

(4) The emissions reporting assumes that the decomposition product CS2 is emitted to the atmosphere adding to the conservativeness of the estimate.

(5) We continue to investigate available literature to further refine and update, as necessary, the CS2 emissions estimation for the conditions at the Mission and South Mills.

Calculation Methodology

A. Scrubbers and Baghouses

1. Annual Emission $\left(\frac{ton}{year}\right)$ = Emission Factor $\left(\frac{pound}{ton}\right)$ x Annual Throughput $\left(\frac{ton}{year}\right)$ $x \frac{1}{2,000} \left(\frac{ton}{pound}\right)$

2. Annual Emission $\left(\frac{ton}{year}\right)$ = Emission Factor $\left(\frac{pound}{hour}\right)$ x 8,760 $\left(\frac{hours}{year}\right)$ $x \frac{1}{2,000} \left(\frac{ton}{pound}\right)$

B. Transfer Points

3. Annual Emission $\left(\frac{ton}{year}\right)$ = Emission Factor $\left(\frac{pound}{ton}\right)$ x Annual Throughput $\left(\frac{ton}{year}\right)$ $x \frac{1}{2,000} \left(\frac{ton}{pound}\right)$ x (1 − Control Efficiency)(%)

4. Annual Emission $\left(\frac{ton}{year}\right)$
= Emission Factor $\left(\frac{pound}{ton}\right)$ x Daily Throughput $\left(\frac{ton}{day}\right)$ $x \frac{1}{24} \left(\frac{day}{hour}\right)$ x 8,760 $\left(\frac{hour}{year}\right)$ $x \frac{1}{2,000} \left(\frac{ton}{pound}\right)$ x (1 − Control Efficiency)(%)

C. CS2 Emissions from Xanthate Usage

5. Annual Emission $\left(\frac{ton}{year}\right)$ = Annual PAX Usage $\left(\frac{pound}{year}\right)$ x Decomposition Rate of PAX(%) x Molar Mass Ratio of CS2 to Pax $\left(\frac{g/gmol}{g/gmol}\right)$ $x \frac{1}{2,000} \left(\frac{ton}{pound}\right)$

Operational Information

South Mill Circuit Permitted Ore Throughput =	12,500,000	ton/yr
South Mill Circuit Permitted Ore Throughput =	3,300	ton/hr
Omnicone Circuit Throughput =	8,760,000	ton/yr
Omnicone Circuit Throughput =	1,000	ton/hr
Concentrate Throughput =	450,000	ton/yr
Concentrate Throughput =	650	ton/hr
Lime Throughput =	20,000	ton/yr
Lime Throughput =	100	ton/hr
Annual Operating Hours =	8,760	hours

Emission Unit	Emission Rate	Exhaust Flow	Emissions (Controlled)					
			PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
	(gr/dscf)	(scfm)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
SSOPS-1	0.003	21,000	0.54	0.54	0.54	2.37	2.37	2.37
SSOPS-2	0.01	4,471	0.38	0.38	0.38	1.68	1.68	1.68
SSOPS-3 (30-150A)	0.003	12,500	0.32	0.32	0.32	1.41	1.41	1.41
SSOPS-3 (30-150B)	0.003	12,500	0.32	0.32	0.32	1.41	1.41	1.41
SSOPS-4	0.01	13,000	1.11	1.11	1.11	4.88	4.88	4.88
SSOPS-4a	0.01	14,800	1.27	1.27	1.27	5.56	5.56	5.56
SSOPS-6	0.003	2,000	0.05	0.05	0.05	0.23	0.23	0.23
		Subtotal	4.00	4.00	4.00	17.52	17.52	17.52

Ore Assay										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

Emission Unit	HAP Emissions										
	Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
SSOPS-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-3 (30-150A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-3 (30-150B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SSOPS-4a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00

Source - PFOPS-0
Description - Transfer Point of Crushed Ore - Dump Pocket

Ore Throughput	12,500,000	ton/year	
Ore Throughput	3,300	ton/hr	
Emission Factor (TSP) =	0.12	lb/ton	(Reference: AP-42, Table 11.24-2, Low-moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.06	lb/ton	(Reference: AP-42, Table 11.24-2, Low-moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.017	lb/ton	($PM_{2.5} = 0.283*PM_{10}$ - Reference: South Mill Expansion Permit Application)
Controlled with enclosure =	25%	percent	(Reference: South Mill Expansion Permit Application)
Controlled with water sprays =	80%	percent	(Reference: South Mill Expansion Permit Application)
Overall control achieved =	85%	percent	(Reference: South Mill Expansion Permit Application)

Source - HFOPS-2
Description - Transfer Point of Crushed Ore to the Stockpile
AP-42, Table 11.24-2: Material Handling and Transfer

Ore Throughput	12,500,000	ton/year	
Ore Throughput	3,300	ton/hr	
Emission Factor (TSP) =	0.12	lb/ton	(Reference: AP-42, Table 11.24-2, Low-moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.06	lb/ton	(Reference: AP-42, Table 11.24-2, Low-moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.017	lb/ton	($PM_{2.5} = 0.283*PM_{10}$ - Reference: South Mill Expansion Permit Application)
Controlled with water sprays =	70%	percent	

Source - WFOPS-1
Description - Coarse ore storage

Emission Factor (TSP) =	1.7 * (s/1.5) * (f/15)		(WRAP, Section 9.3)
Where			
s, silt content of material (weight %) =	4.3		(Reference: AP-42, Table 13.2.4-1, Pellet Ore)
f, % of time the wind speed > 12 mph =	100		(See Note #1)
Emission Factor (TSP) =	32.49	lb/year/acre	
Emission Factor (PM_{10}) =	16.24	lb/year/acre	
Emission Factor ($PM_{2.5}$) =	2.44	lb/year/acre	
Stockpile Height =	60	ft	(Reference: Google Earth©)
Stockpile Radius =	200	ft	(Reference: Google Earth©)
Stockpile Surface Area =	256,894	ft2	
Stockpile Surface Area =	6	acres	

Source PFOPS-6 and 7
Description - SAG Reclaim Circuit; Belt 20-244/245 to 20-266/268
Note: Emissions from this emission point are controlled by SSOPS-3 (30-150A and 30-150B) and are therefore not calculated separately.

Source PFOPS-8

Description - Omnicone Circuit; Belt 20-238/241 to 20-250

Annual Ore Throughput =	8,760,000	ton/yr	
Hourly Ore Throughput =	1,000	ton/hr	
Emission Factor (TSP) =	0.01	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.004	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.001	lb/ton	($PM_{2.5} = 0.283*PM_{10}$ - Reference: South Mill Expansion Permit Application)
Controlled (wet process and enclosure) =	70%	percent	

Source - PSOPS-11

Description - Transfer from Omnicone crushers

Note: Emissions from this emission point are controlled by SSOPS-4 and are therefore not calculated separately.

Source - PSOPS-12

Description - Transfer from Omnicone crushers (bypass)

Note: Emissions from this emission point are controlled by SSOPS-4 and are therefore not calculated separately.

Source - PSOPS-13

Description - Transfer from Omnicone crushers (Return)

Note: Emissions from this emission point are controlled by SSOPS-3 (30-150A and 30-150B) and are therefore not calculated separately.

Source - HFOPS-3

Description - Transfer of oversize ore to intermediate ore stockpile from Belt 20-250

Ore Throughput =	8,760,000	ton/yr	
Ore Throughput =	1,000	ton/hr	
Emission Factor (TSP) =	0.01	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.004	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.001	lb/ton	($PM_{2.5} = 0.283*PM_{10}$ - Reference: South Mill Expansion Permit Application)
Control achieved (Wet process and enclosure) =	70%	percent	

Source - WFOPS-2
Description - Intermediate Ore Storage Pile (Wind Erosion)

Emission Factor (TSP) =	1.7 * (s/1.5) * (f/15)		(WRAP, Section 9.3)
Where			
s, silt content of material (weight %) =	4.3		(Reference: AP-42, Table 13.2.4-1, Pellet Ore)
f, % of time the wind speed > 12 mph =	100		(See Note #1)
Emission Factor (TSP) =	32.49	lb/year/acre	
Emission Factor (PM_{10}) =	16.24	lb/year/acre	
Emission Factor ($PM_{2.5}$) =	2.44	lb/year/acre	
Stockpile Height =	20	ft	
Stockpile Radius =	100	ft	
Stockpile Surface Area =	63,462	ft2	
Stockpile Surface Area =	1	acres	

Source - HFOPS-4
Description - Conveyer to Concentrate Stacking

Concentrate Throughput =	450,000	ton/yr	
Concentrate Throughput =	650	ton/hr	
Emission Factor (TSP) =	0.01	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.004	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.001	lb/ton	($PM_{2.5}$ = 0.283*PM_{10} - Reference: South Mill Expansion Permit Application)
Control achieved (Wet process and enclosure) =	70%	percent	

Source - HFOPS-5
Description - Concentrate Loading
AP-42, Table 11.24-2: Material Handling and Transfer

Concentrate Throughput =	450,000	ton/yr	
Concentrate Throughput =	650	ton/hr	
Emission Factor (TSP) =	0.01	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor (PM_{10}) =	0.004	lb/ton	(Reference: AP-42, Table 11.24-2, High Moisture Ore, Material Handling)
Emission Factor ($PM_{2.5}$) =	0.001	lb/ton	($PM_{2.5}$ = 0.283*PM_{10} - Reference: South Mill Expansion Permit Application)
Control achieved (Wet process and enclosure) =	25%	percent	

Source - WFOPS-3
Description - Concentrate Storage Pile (Wind Erosion)

Emission Factor (TSP) =	1.7 * (s/1.5) * (f/15)	(WRAP, Section 9.3)
Where		
s, silt content of material (weight %) =	4.3	(Reference: AP-42, Table 13.2.4-1, Pellet Ore)
f, % of time the wind speed > 12 mph =	100	(See Note #1)

Emission Factor (TSP) =	32.49	lb/year/acre
Emission Factor (PM_{10}) =	16.24	lb/year/acre
Emission Factor ($PM_{2.5}$) =	2.44	lb/year/acre
Stockpile Height =	25	ft
Stockpile Radius =	100	ft
Stockpile Surface Area =	63,807	ft2
Stockpile Surface Area =	1	acres

Source - PFOPS-16
Description - Lime loading to Lime Bin (Pneumatic)
Note: Emissions from this emission point are controlled by SSOPS-6 and are therefore not calculated separately.

Source - PFOPS-17
Description - Lime Bin to Feeder
Note: Emissions from this emission point are controlled by SSOPS-6 and are therefore not calculated separately.

Source - PFOPS-18
Description - Belt Conveyer from the Lime Silo to the Ball Mill
Note: PFOPS-18 is the belt conveyer itself and is not an emission point.

Source - PFOPS-19
Description - Lime Ball Mill
Note: PFOPS-18 is the belt conveyer itself and is not an emission point.

Emission Unit	Uncontrolled Emissions						Controlled Emissions					
	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
PFOPS-0	n/a	n/a	n/a	n/a	n/a	n/a	59.40	29.70	8.41	112.50	56.25	15.92
HFOPS-2	n/a	n/a	n/a	n/a	n/a	n/a	118.80	59.40	16.81	225.00	112.50	31.84
WFOPS-1	0.02	0.01	0.00	0.10	0.05	0.01	n/a	n/a	n/a	n/a	n/a	n/a
PFOPS-8	n/a	n/a	n/a	n/a	n/a	n/a	3.00	1.20	0.34	13.14	5.26	1.49
HFOPS-3	n/a	n/a	n/a	n/a	n/a	n/a	3.00	1.20	0.34	13.14	5.26	1.49
WFOPS-2	0.01	0.00	0.00	0.02	0.01	0.00	n/a	n/a	n/a	n/a	n/a	n/a
HFOPS-4	n/a	n/a	n/a	n/a	n/a	n/a	1.95	0.78	0.22	0.68	0.27	0.08
HFOPS-5	n/a	n/a	n/a	n/a	n/a	n/a	4.88	1.95	0.55	1.69	0.68	0.19
WFOPS-3	0.01	0.00	0.00	0.02	0.01	0.00	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal	0.03	0.02	0.00	0.14	0.07	0.01	191.03	94.23	26.67	366.14	180.21	51.00

Ore Assay										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

Emission Unit	HAP Emissions										
	Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
PFOPS-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00
HFOPS-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00
WFOPS-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PFOPS-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
HFOPS-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
WFOPS-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFOPS-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WFOPS-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00

CS2 Emissions From Xanthate Use - South Circuit

Quantity of PAX Used in the Mission Circuit =	700,000	lb
Quantity of PAX Used in the Mission Circuit =	350.00	ton

Decomposition rate of PAX =	1.58% (See Note #2)
Mole ratio of CS2 to PAX (Decomposition Coefficient) =	0.50

Note: It is assumed that 3 moles of CS2 are evaporated for every sixmoles of PAX that decompose:

6ROCS2- + 3H2O ---> 6ROH + CO3(2-) + 3CS2 + 2CS3(2-)

Molecular weight of PAX =	202.4	gram/gram-mol
Molecular weight of CS2 =	76.14	gram/gram-mol

Quantity of CS2 Formed =	2080.31	lbs
Quantity of CS2 Formed =	0.24	lb/hr (Annual Average)
Quantity of CS2 Formed =	1.04	ton

Footnote:

Note #1 - The annual average wind speed for the site ranges from about 6 mph to 7 mph. For the purposes of developing an emission factor for the PTE average wind greater than 12 mph are assumed for a 100 percent of the time to provide a conservative estimate.

Note #2 -

(1) CS2 emissions are estimated using the emissions calculation methods provided in "Stationary and Mobile Source Emission Calculations for the NorthMet Project – Combined Report (RS57) PolyMet Mining Inc, November 2008.

(2) CS2 emissions are estimated by considering the annual usage of PAX powder (lb/year) and the decomposition rate for PAX when in solution

(3) Decomposition of PAX in solution and hence formation of CS2 is dependent on a number of factors , including temperature and pH. A higher pH results in a reduced decomposition rate of the PAX while the rate of decomposition increases with increasing temperature. Mission Mine's floatation systems at both the North and South Mills are operated at a relative high pH (10.-11) and ambient temperatures (around 25 C). It is known that in acidic solution xanthate decomposes to carbon disulfide and fresh xanthate solutions are neutral. Under these conditions the formation of CS2 is greatly reduced . Therefore, CS2 emissions estimated above are conservative.

(4) The emissions reporting assumes that the decomposition product CS2 is emitted to the atmosphere adding to the conservativeness of the estimate.

(5) We continue to investigate available literature to further refine and update, as necessary, the CS2 emissions estimation for the conditions at the Mission and South Mills.

Concentrate Throughput =	2,000	lb/hr
Concentrate Throughput =	8,760	tons/year
Operating hours	8,760	hours

Emission Unit	Emission Rate	Exhaust Flow	Emissions (Controlled)					
			PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
	(gr/dscf)	(scfm)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
SSMP-1; Moly Scrubber	0.022	7,000	1.31	1.31	1.31	5.74	5.74	5.74

Ore Assay										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

Emission Unit	HAP Emissions										
	Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
SSMP-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CFMP-1 and CFMP-2 Dryers

Dryer	Size	Gas Fire Rate	Operating Hours
	(Btu/hr)	(ft3/hr)	(hours)
CFMP-1	3,000,000	2,857	8,760
CFMP-2	3,000,000	2,857	8,760

Emission Factors for CFMP-1 and CFMP-2 Dryers

Criteria Pollutants (Reference: AP-42, Table 1.4-1 and 1.4-2)

Emission Factor (SO_2)	0.6	lb/MMscf
Emission Factor (NO_2)	100	lb/MMscf
Emission Factor (CO)	84	lb/MMscf
Emission Factor (PM Total)	7.6	lb/MMscf
Emission Factor (VOC)	5.5	lb/MMscf
Emission Factor (CO2) =	120,000	lb/MMscf
Emission Factor (CH4) =	2.3	lb/MMscf
Emission Factor (N2O) =	2.2	lb/MMscf

HAPs (Reference: AP-42, Table 1.4-3)

Emission Factor (2-Methylnaphthalene)	2.40E-05	lb/MMscf
Emission Factor (3-Methylchloranthrene)	1.80E-06	lb/MMscf
Emission Factor (7,12-Dimethylbenz(a)anthracene)	1.60E-05	lb/MMscf
Emission Factor (Acenaphthene)	1.80E-06	lb/MMscf
Emission Factor (Acenaphthylene)	1.80E-06	lb/MMscf
Emission Factor (Anthracene)	2.40E-06	lb/MMscf
Emission Factor (Benz(a)anthracene)	1.80E-06	lb/MMscf
Emission Factor (Benzene)	2.10E-03	lb/MMscf
Emission Factor (Benzo(a)pyrene)	1.20E-06	lb/MMscf
Emission Factor (Benzo(b)fluoranthene)	1.80E-06	lb/MMscf
Emission Factor (Benzo(g,h,i)perylene)	1.20E-06	lb/MMscf
Emission Factor (Benzo(k)fluoranthene)	1.80E-06	lb/MMscf
Emission Factor (Chrysene)	1.80E-06	lb/MMscf
Emission Factor (Dibenzo(a,h)anthracene)	1.20E-06	lb/MMscf
Emission Factor (Dichlorobenzene)	1.20E-03	lb/MMscf
Emission Factor (Fluoranthene)	3.00E-06	lb/MMscf
Emission Factor (Fluorene)	2.80E-06	lb/MMscf
Emission Factor (Formaldehyde)	7.50E-02	lb/MMscf
Emission Factor (Hexane)	1.80E+00	lb/MMscf
Emission Factor (Indeno(1,2,3-cd)pyrene)	1.80E-06	lb/MMscf
Emission Factor (Naphthalene)	6.10E-04	lb/MMscf
Emission Factor (Phenanathrene)	1.70E-05	lb/MMscf
Emission Factor (Pyrene)	5.00E-06	lb/MMscf
Emission Factor (Toluene)	3.40E-03	lb/MMscf
Emission Factor (Arsenic)	2.00E-04	lb/MMscf
Emission Factor (Beryllium)	1.25E-05	lb/MMscf
Emission Factor (Cadmium)	1.10E-03	lb/MMscf
Emission Factor (Chromium)	1.40E-03	lb/MMscf
Emission Factor (Cobalt)	8.40E-05	lb/MMscf
Emission Factor (Manganese)	3.80E-04	lb/MMscf
Emission Factor (Mercury)	2.60E-04	lb/MMscf
Emission Factor (Nickel)	2.10E-03	lb/MMscf
Emission Factor (Selenium)	2.40E-05	lb/MMscf

Emission Unit	Emissions (Uncontrolled)									
	SO_2	NO_2	CO	PM	VOC	SO_2	NO_2	CO	$PM/PM_{10}/PM_{2.5}$	VOC
	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
CFMP-1 Dryer	0.002	0.286	0.240	0.022	0.016	0.008	1.251	1.051	0.095	0.069
CFMP-2 Dryer	0.002	0.286	0.240	0.022	0.016	0.008	1.251	1.051	0.095	0.069
TOTAL	0.00	0.57	0.48	0.04	0.03	0.02	2.50	2.10	0.19	0.14

Emission Unit	Emissions (Uncontrolled)			
	CO2	CH4	N2O	CO2e
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
CFMP-1 Dryer	1,501.71	0.03	0.03	1,510.64
CFMP-2 Dryer	1,501.71	0.03	0.03	1,510.64
TOTAL	3,003.43	0.06	0.06	3,021.28

HAP	CFMP-1 (ton/yr)	CFMP-2 (ton/yr)
2-Methylnaphthalene	0.000	0.000
3-Methylchloranthrene	0.000	0.000
7,12-Dimethylbenz(a)anthracene	0.000	0.000
Acenaphthene	0.000	0.000
Acenaphthylene	0.000	0.000
Anthracene	0.000	0.000
Benz(a)anthracene	0.000	0.000
Benzene	0.000	0.000
Benzo(a)pyrene	0.000	0.000
Benzo(b)fluoranthene	0.000	0.000
Benzo(g,h,i)perylene	0.000	0.000
Benzo(k)fluoranthene	0.000	0.000
Chrysene	0.000	0.000
Dibenzo(a,h)anthracene	0.000	0.000
Dichlorobenzene	0.000	0.000
Fluoranthene	0.000	0.000
Fluorene	0.000	0.000
Formaldehyde	0.001	0.001
Hexane	0.023	0.023
Indeno(1,2,3-cd)pyrene	0.000	0.000
Naphthalene	0.000	0.000
Phenanathrene	0.000	0.000
Pyrene	0.000	0.000
Toluene	0.000	0.000
Arsenic	0.000	0.000
Beryllium	0.000	0.000
Cadmium	0.000	0.000
Chromium	0.000	0.000
Cobalt	0.000	0.000
Manganese	0.000	0.000
Mercury	0.000	0.000
Nickel	0.000	0.000
Selenium	0.000	0.000
Total	0.02	0.02

Footnotes:

Note #1 - SSMP-1 is limited to an emission rate of 0.05 grams/dscm (Condition Part B, Section 11, II.B.1). This emission rate is converted to grains/dscf, as follows, to support the emissions calculations.

Permitted emission rate =	0.05	grams/dscm
1 gram =	15.43	grains
1 cubic meter =	35.31	cubic feet
Permitted emission rate =	0.022	grains/dscf

Gasoline Storage Tank

Tank volume = 20,000 gallons
Annual throughput = 120,000 gallons

(referenced from MSDS)	Benzene	Ethyl Benzene	Butyl Ether	Naphthalene	Xylene	Toluene	Hexane
Percent by Weight	4.90%	3.00%	15%	2.00%	15.00%	15.00%	5.00%

VOC Emissions = 6,628.81 pounds/yr
VOC Emissions = 0.76 pounds/hr
VOC Emissions = 3.31 tons/yr

HAP Emission (Uncontrolled) - Gasoline Storage Tank						
Benzene	Ethyl Benzene	Butyl Ether	Naphthalene	Xylene	Toluene	Hexane
(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
0.162	0.099	0.497	0.066	0.497	0.497	0.166

Gasoline Dispensing

Annual throughput = 120,000 gallons

(referenced from MSDS)	Benzene	Ethyl Benzene	Butyl Ether	Naphthalene	Xylene	Toluene	Hexane
Percent by Weight	4.90%	3.00%	15%	2.00%	15.00%	15.00%	5.00%

VOC Emission Factor = 11 lb/1,000 gallon (Ref: US, EPA, AP-42, Chapter 5.2, Table 5.2-7)

VOC Emissions = 1,320.00 pounds/yr
VOC Emissions = 0.15 pounds/hr
VOC Emissions = 0.66 tons/yr

HAP Emission (Uncontrolled) - Gasoline Dispensing						
Benzene	Ethyl Benzene	Butyl Ether	Naphthalene	Xylene	Toluene	Hexane
0.007	0.005	0.023	0.003	0.023	0.023	0.008
0.032	**0.020**	**0.099**	**0.013**	**0.099**	**0.099**	**0.033**

Diesel Storage Tank

Location	Name	Contents	Annual Throughput	Height (ft)	Diameter (ft)	Capacity (gallons)	VOC Emissions (lbs/yr)	VOC Emissions (lbs/hr)	VOC Emissions (tons/yr)
Tank Farm	Storage Tank	Diesel	6,979,909	30	38	250,000	595.69	0.07	0.30
Tank Farm	Storage Tank	Diesel	2,326,636	30	10.65	20,000	46.69	0.01	0.02
Tank Farm	Storage Tank	Diesel	2,326,636	30	10.65	20,000	46.69	0.01	0.02
Tank Farm	Storage Tank	Diesel	2,326,636	30	10.65	20,000	46.69	0.01	0.02

(referenced from MSDS)	Naphthalene
Percent by Weight	1.00%

Emission Point	Naphthalene (ton/yr)
Diesel Tanks	0.00

Engines

(1) North Mill Admin Generator

Annual operating hours =	1,000	hours		
Rated capacity =	56	kW	75	bhp
Rated capacity =	0.19	MMBtu/hr		

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
			(lb/hr)	(ton/year)	
NOx	2.53	g/bhp-hr	0.42	0.21	Exhaust emission data sheet
SOx	2.05E-03	lb/hp-hr	0.15	0.08	AP-42, Ch: 3.3, Table 3.3-1
VOC	0.0025141	lb/hp-hr	0.19	0.09	AP-42, Ch: 3.3, Table 3.3-1
PM	0.0149	g/bhp-hr	0.00	0.00	Exhaust emission data sheet
PM_{10}	0.0149	g/bhp-hr	0.00	0.00	Exhaust emission data sheet
$PM_{2.5}$	0.0149	g/bhp-hr	0.00	0.00	Assumed $PM_{2.5} = PM_{10}$
CO	3.72	g/bhp-hr	0.62	0.31	Exhaust emission data sheet
CO2	1.15	lb/hp-hr	86.33	43.16	AP-42, Ch: 3.3, Table 3.3-1
CH4	6.60E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
N2O	1.32E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
CO2e	n/a	n/a	86.43	43.22	n/a
Benzene	9.33E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Toluene	4.09E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Xylenes	2.85E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
1,3-Butadiene	3.91E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Formaldehyde	1.18E-03	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acetaldehyde	7.67E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acrolein	9.25E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Naphthalene	8.48E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2

(2) North Mill Thickener Generator

Annual operating hours =	1,000	hours		
Rated capacity =	63	kW	84	bhp
Rated capacity =	0.21	MMBtu/hr		

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
			(lb/hr)	(ton/year)	
NOx	4.7	g/kW-hr	0.65	0.33	Title V permit
SOx	1.25E-03	kg/kw-hr	0.17	0.09	AP-42, Ch: 3.3, Table 3.3-1
VOC	0.001528573	kg/kw-hr	0.21	0.11	AP-42, Ch: 3.3, Table 3.3-1
PM	0.4	g/kW-hr	0.06	0.03	Title V permit
PM_{10}	0.4	g/kW-hr	0.06	0.03	Title V permit
$PM_{2.5}$	0.4	g/kW-hr	0.06	0.03	Assumed $PM_{2.5} = PM_{10}$
CO	5	g/kW-hr	0.69	0.35	Title V permit
CO2	1.15	lb/hp-hr	97.12	48.56	AP-42, Ch: 3.3, Table 3.3-1
CH4	6.60E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
N2O	1.32E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
CO2e	n/a	n/a	97.24	48.62	n/a
Benzene	9.33E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Toluene	4.09E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Xylenes	2.85E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
1,3-Butadiene	3.91E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Formaldehyde	1.18E-03	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acetaldehyde	7.67E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acrolein	9.25E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Naphthalene	8.48E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2

(3) Dispatch Location Generator

Annual operating hours =	1,000	hours		
Rated capacity =	56	kW	75	bhp
Rated capacity =	0.19	MMBtu/hr		

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
			(lb/hr)	(ton/year)	
NOx	2.53	g/bhp-hr	0.42	0.21	Exhaust emission data sheet
SOx	1.25E-03	kg/kw-hr	0.15	0.08	AP-42, Ch: 3.3, Table 3.3-1
VOC	0.001528573	kg/kw-hr	0.19	0.09	AP-42, Ch: 3.3, Table 3.3-1
PM	0.0149	g/bhp-hr	0.00	0.00	Exhaust emission data sheet
PM_{10}	0.0149	g/bhp-hr	0.00	0.00	Exhaust emission data sheet
$PM_{2.5}$	0.0149	g/bhp-hr	0.00	0.00	Assumed $PM_{2.5} = PM_{10}$
CO	3.72	g/bhp-hr	0.62	0.31	Exhaust emission data sheet
CO2	1.15	lb/hp-hr	86.33	43.16	AP-42, Ch: 3.3, Table 3.3-1
CH4	6.60E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
N2O	1.32E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
CO2e	n/a	n/a	86.43	43.22	n/a
Benzene	9.33E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Toluene	4.09E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Xylenes	2.85E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
1,3-Butadiene	3.91E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Formaldehyde	1.18E-03	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acetaldehyde	7.67E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acrolein	9.25E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Naphthalene	8.48E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2

(4) South Mill Generator

Annual operating hours =	1000	hours		
Rated capacity =	365	kW	489	bhp
Rated capacity =	1.25	MMBtu/hr		

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
			(lb/hr)	(ton/year)	
NOx	0.018848	kg/kw-hr	15.13	7.57	Title V permit
SOx	1.25E-03	kg/kw-hr	1.00	0.50	AP-42, Ch: 3.3, Table 3.3-1
VOC	0.001528573	kg/kw-hr	1.23	0.61	AP-42, Ch: 3.3, Table 3.3-1
PM	1.34E-03	kg/kw-hr	1.07	0.54	Title V permit
PM_{10}	1.34E-03	kg/kw-hr	1.07	0.54	Title V permit
$PM_{2.5}$	1.34E-03	kg/kw-hr	1.07	0.54	Assumed $PM_{2.5} = PM_{10}$
CO	4.06E-03	kg/kw-hr	3.26	1.63	Title V permit
CO2	1.15	lb/hp-hr	562.67	281.33	AP-42, Ch: 3.3, Table 3.3-1
CH4	6.60E-03	lb/MMBtu	0.01	0.00	40 CFR Part 98, Table C-2
N2O	1.32E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
CO2e	n/a	n/a	563.36	281.68	n/a
Benzene	9.33E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Toluene	4.09E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Xylenes	2.85E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
1,3-Butadiene	3.91E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Formaldehyde	1.18E-03	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acetaldehyde	7.67E-04	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Acrolein	9.25E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2
Naphthalene	8.48E-05	lb/MMBtu	0.00	0.00	AP-42, Ch: 3.3, Table 3.3-2

(5) South Mill Tank Hill Generator

Annual operating hours =	100	hours		
Rated capacity =	60	kW	80	bhp
Rated capacity =	0.20	MMBtu/hr		

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
			(lb/hr)	(ton/year)	
NOx	13.4	gram/kW-hr	1.77	0.09	Title V permit
SOx	5.88E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
VOC	2.96E-02	lb/MMBtu	0.01	0.00	AP-42, Table 3.2-2
PM	9.99E-03	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
PM_{10}	9.99E-03	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
$PM_{2.5}$	9.99E-03	lb/MMBtu	0.00	0.00	Assumed $PM_{2.5} = PM_{10}$
CO	519.00	gram/kW-hr	68.65	3.43	Title V permit
CO2	1.10E+02	lb/MMBtu	22.52	1.13	AP-42, Table 3.2-2
CH4	1.25E+00	lb/MMBtu	0.26	0.01	AP-42, Table 3.2-2
N2O	1.32E-03	lb/MMBtu	0.00	0.00	40 CFR Part 98, Table C-2
CO2e	n/a	n/a	29.00	1.45	n/a
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
1,3-Dichloropropene	1.27E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Benzene	1.58E-03	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Toluene	5.58E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Xylenes	1.95E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Formaldehyde	2.05E-02	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Acetaldehyde	2.79E-03	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Acrolein	2.63E-03	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Naphthalene	9.71E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Carbon Tetrachloride	1.77E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Chlorobenzene	1.29E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Chloroform	1.37E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Ethylbenzene	2.48E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Ethylene Dibromide	2.13E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Methanol	3.06E-03	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Methylene Chloride	4.12E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
PAH	1.41E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Styrene	1.19E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2
Vinyl Chloride	7.18E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2

Wind Erosion-Tailings Dams (WFDA-1)

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{pound}{acre}\right) x \text{ Acres}\left(\frac{acres}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hours}\right) x\ (1 - \text{Percent Control (\%)})$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{pound}{acre}\right) x \text{ Acres}\left(\frac{acres}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right) x\ (1 - \text{Percent Control (\%)})$$

Emission Factor (PM) =	3,513	lbs/acre-yr	(Reference: The emission factors are from the Hayden Mine SIP, Appendix E.)
Emission Factor (PM_{10}) =	193	lbs/acre-yr	(Reference: The emission factors are from the Hayden Mine SIP, Appendix E.)
Emission Factor ($PM_{2.5}$) =	193	lbs/acre-yr	(Reference: Conservatively assumed to be equal to PM_{10})
Total Tailing Acres	4,600	acre	

Controlled with chemical application = 99% (See Note #1)

Emissions (Controlled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
18.45	1.01	1.01	80.80	4.44	4.44

Ore Assay										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.5	6.6	0.025	1.7	13	5.2	13	500	0.025	0.9	0.5

HAP Emission										
Sb	As	Be	Cd	Cr	Co	Pb	Mn	Hg	Ni	Se
(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00

$$\text{PM Emissions}\left(\frac{lb}{hr}\right) = \text{Emission Factor}\left(\frac{pound}{ton}\right) x \text{ Overburden Deposited}\left(\frac{ton}{year}\right) x \frac{1}{8{,}760}\left(\frac{year}{hours}\right)$$

$$\text{PM Emissions}\left(\frac{ton}{year}\right) = \text{Emission Factor}\left(\frac{pound}{ton}\right) x \text{ Overburden Deposited}\left(\frac{ton}{year}\right) x \frac{1}{2{,}000}\left(\frac{ton}{pound}\right)$$

Overburden (waste Dumps) 128,615,469 tons/yr

Emissions Calculations

E = k(0.0032)((U/5)^1.3/(M/2^1.4) Reference: AP-42, Table 13.2.4.3: Aggregate Handling and Storage Piles

k =	0.74	TSP	
k =	0.35	PM_{10}	
k =	0.053	$PM_{2.5}$	
U =	10	miles/hr	(see Note #2)
M =	2.6	moisture (%)	(see Note #3)

Emission Factor (TSP) =	0.00404	lb/ton	(Note #4)
Emission Factor (PM_{10}) =	0.00191	lb/ton	
Emission Factor ($PM_{2.5}$) =	0.00029	lb/ton	

Emissions (Uncontrolled)					
PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
59.29	28.04	4.25	259.69	122.83	18.60

Footnotes

Note #1- AP-42 Chapter 13.2.4 states that the continuous chemical treating of storage piles can have a control efficiency of up to 90%, however based on operations and activity, a higher control factor (fugitive) is applied to this source (tailing) based on the the chemical application and wetting operations at the facility.

Note #2 - The annual average wind speed for the site ranges from about 6 mph to 7 mph. This PTE estimate uses 10 mph as a the average annual wind speed to provide a conservative estimate of the emissions.

Note #3 - Average site ore moisture content

Note #4 - Windblown emissions are considered to be minial as theseare primarily rock dumps. Emissions are therefore considered very conservative.