

**TECHNICAL REVIEW AND EVALUATION
AIR QUALITY CONTROL PERMIT NO. 39948
FOR
ASARCO LLC-HAYDEN OPERATIONS**

I. INTRODUCTION

This renewal Title V permit is issued to ASARCO LLC, the Permittee, for the continued operation of their copper concentrator and smelter facilities, located in Hayden, Gila County, Arizona. The facility produces 99% pure copper anodes and commercial grade (93% and 98%) sulfuric acid. This permit renews and supersedes Permit No. M070399P1-99 for the concentrator, and Permit No. 1000042 for the smelter.

A. Company Information

Facility Name: ASARCO LLC-Hayden Operations

Mailing Address: P.O. Box 8, Hayden, AZ 85135

Facility Address: 6094 N. Asarco Road, Hayden, Gila County, AZ 85135

B. Attainment Classification

The Hayden area is currently designated as non-attainment for particulate matter with a diameter less than 10 microns (PM₁₀), sulfur dioxide (SO₂) and lead. The area is attainment or unclassified for all other pollutants.

C. Background Information

Previously the facility was issued separate major source permits for the concentrator and the smelter facilities.

Permit No. M-070399P1-99 for the concentrator was issued on May 30, 2001. The application for renewal of this permit was received on November 30, 2005, and was assigned permit No. 38459.

Permit No. 1000042 for the smelter was issued on October 9, 2001. The application for renewal of this permit was received on April 10, 2006 and was assigned Permit No. 39948.

On December 7, 2007, ADEQ determined that the renewal applications for both the operations should be processed in a single permit as the two sources are categorized as a single "stationary source" in accordance with A.A.C. R18-2-101(113) and issue a single permit to the facility. However, the permit could not be concluded because of ongoing litigation with EPA.

On December 30, 2015, ASARCO entered into a Consent Decree CD CV-15-02206-PHX-DLR with EPA whereby ASARCO L.L.C. was required to implement the Converter Retrofit Project (CRP). This project involves the following major changes to the facility:

1. Installation of improved converter primary and secondary hooding systems;



2. Installation of a new tertiary hooding system over the converter aisle;
3. Replacement of the five (5) existing Peirce-Smith converters with three (3) new Peirce-Smith converters of increased size (approximately 15 feet by 35 feet);
4. Replacement of the existing R&R Cottrell with a baghouse (the Vent Gas Baghouse);
5. Change to high surface area ("HSA") lime injection on the secondary hood gas for greater control of sulfur dioxide emissions; and
6. Installation of an HSA lime injection system on the flash furnace vent gas.

All the above improvements are designed to achieve, at a minimum, 97% primary hood capture of Blowing emissions, 97% secondary hood capture of Blowing emissions escaping the primary hood, 90% secondary hood capture of charging and skimming emissions, and 95% tertiary hood capture of all copper converter emissions escaping the primary and secondary hoods.

Subsequent to the Consent Decree, a Significant Permit Revision No. 60647 was issued on January 19, 2016 to authorize construction of the CRP.

On May 8, 2017, ASARCO submitted a revised permit application for renewal of the permit and for incorporation of the Consent Decree requirements into the Title V permit.

This renewal permit incorporates the following new requirements not included in the prior permits:

1. All the requirements mandated by the CD CV-15-02206-PHX-DLR Paragraph 101.
2. National Emissions Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR 63 Subpart EEEEEEE (as applicable to current operations).
3. NESHAP under 40 CFR 63 Subpart QQQ (as mandated by the Consent Decree prior to termination of the Consent Decree).
4. Requirements for sulfur dioxide (SO₂) emissions from State Rule A.A.C R18-2-B1302, which has been submitted to EPA as a revision to the state implementation plan (SIP).
5. Requirements for lead emissions from State Rules A.A.C R18-2-B1301 and B1301.01, which has been submitted to EPA as a revision to the SIP.
6. Requirements for reverts and silica flux crushing and screening operations (These operations are performed on-site at ASARCO by an outside contractor, Smithco).
7. Regional Haze Federal Implementation Plan (FIP) requirements under 40 CFR 52.145(l).

II. PROCESS DESCRIPTION



A. Concentrator Operations

The concentrator facility consists of the following operations:

1. Receiving ore by rail car.
2. Secondary and tertiary crushing operations for size reduction.
3. Grinding and froth floatation operations where copper concentrate is produced and sent to smelter.
4. Processing of tailings from the froth floatation process.

B. Smelter Operations

1. Unloading operations for copper concentrate, fluxes and coke to create the flash furnace feed mix
2. Drying of furnace feed mix in the dryers
3. Flash furnace smelting operations to produce copper matte
4. Converters for conversion of copper matte (50 – 60% copper) to blister copper (approximate 98% purity)
5. Anode furnaces and anode casting for production of 99% purity copper which is sent to ASARCO's refinery in Texas.
6. Sulfuric acid plant for conversion of SO₂ gases from flash furnace and converters to produce 93% and 98% sulfuric acid.
7. Brick crushing operations for crushing and screening of furnace bricks
8. Slag and miscellaneous material processing and handling operations.

C. Smithco Operations

1. Revert crushing and screening operations
2. Flux crushing and screening operations

III. EMISSIONS

Table 1 below depicts the facility-wide potential to emit (PTE). The facility has the potential to emit greater than 100 tons per year of particulate matter (PM), PM₁₀, sulfur dioxide, nitrogen oxides and carbon monoxide. Thus, the facility is classified as a Major Source, pursuant to A.A.C. R18-2-101.64. Emissions of Hazardous Air Pollutants (HAPs) from the facility are less than 10 tons per year for any single pollutant, and less than 25 tons per year for all hazardous air pollutants. The facility-wide emissions, based on the information provided in the application and subsequent updates, are as follows:

**Table 1- Potential to Emit**

Pollutant	Smelter	Concentrator	Smithco	Total Tons per Year
	Tons per Year	Tons per Year	Tons per Year	
PM	455.2	1077.8	18.1	1551.1
PM ₁₀	1688.7	392.8	6.6	2088.1
PM _{2.5}	1406.9	161.1	1.2	1569.2
SO ₂	2523.8	0.3	-	2524.1
NO _x	275.7	5.4	-	281.1
CO	140.8	1.9	-	142.7
VOC	12.1	0.4	-	12.5
SAM	125.0	-	-	125.0
Total HAPs	15.39	2.96	0.26	18.61
CO ₂	205707.0	1610.1	-	207317.1
CH ₄	3.7	0	-	3.7
N ₂ O	3.5	0	-	3.5
CO ₂ e	206848.7	1583.1	-	208431.8
Lead	3.87	0.22	0.21	4.3
Arsenic	3.31	0.05	0.01	3.37

IV. HAZARDOUS AIR POLLUTANTS (HAPs) EMISSIONS

The facility-wide HAPs emissions, as estimated by the Permittee, are below 10 tons per year for any single HAP and less than 25 tons per year for total HAPs. The permit establishes limits to ensure that the facility remains an area source. The permit provides for a methodology to determine facility-wide HAPs emissions on a rolling 12-month period basis from all stacks and fugitive emission sources to assure compliance with the limits.

V. SUMMARY OF CONSENT DECREE PROVISIONS INCORPORATED INTO THE PERMIT

The following requirements from the Consent Decree CV-15-02206-PHX-DLR are incorporated into the renewal permit. Some of these requirements are also found in Air Quality Permit 60647.

- A. Discontinuation of all five existing converters, and installation of R&R Cottrell ESP replacement baghouse (vent gas baghouse) by May 1, 2018.
- B. Completion of the Converter Retrofit Project by December 1, 2018
- C. Emission Limitations
 - 1. PM emission limits for acid plant, secondary hood baghouse, anode furnaces



baghouse and vent gas baghouse;

2. Total PM Limit for any combination of stacks, vents, or other openings on furnaces, reactors, or other types of process vessels;
3. SO₂ emission limits for main stack, secondary hood baghouse and tertiary hood exhaust stream; and
4. SO₂ control efficiency of 50% for High-Surface-Area (HSA) Hydrated Lime injection for secondary hood baghouse and new vent gas baghouse.

D. Monitoring Requirements

1. Monitoring of operating parameters for primary, secondary and tertiary capture systems;
2. SO₂ CEMS on vent gas baghouse, anode baghouse, acid plant tail gas, secondary hood baghouse and tertiary hood exhaust stream;
3. Monitoring of SO₂ control efficiency for High-Surface-Area Hydrated Lime injection for secondary hood baghouse and new vent gas baghouse;
4. PM CEMS on gas streams exiting anode furnaces baghouse, acid plant, secondary hood baghouse, tertiary hooding, and vent gas baghouse;
5. Long-path optical density/opacity monitors on the outside of the building housing the flash furnace, converters, and anode furnaces after the initial fugitive emission study has been conducted; and
6. Operational requirements for baghouses and scrubbers.

E. Initial fugitive emissions study within six months after completion of the CRP, followed by a repeat study after 5 years

F. EPA approved Fugitive Dust Plan prepared in accordance with Appendix "B" of the Consent Decree addressing the requirements for:

1. Track hopper and crushing operations in the concentrator area;
2. Handling of uncrushed and crushed reverts, refractory bricks and silica flux;
3. Fine ore storage operations, concentrate storage and handling operations and bedding operations;
4. Handling of acid plant scrubber blowdown;
5. Paved and unpaved roads;
6. Tailing facilities;
7. Wind fences, storage piles, conveyors, sprayer and non-sprayer wetting operations;
8. Periodic inspections;



9. Opacity monitoring including requirements for long-path optical density/opacity monitors to detect dust emissions at major openings on the secondary crusher and fine ore storage buildings;
10. Ambient monitoring; and
11. Recordkeeping and reporting requirements

VI. REQUIREMENTS FROM SO₂ AND LEAD STATE IMPLEMENTATION PLANS (SIPs)

The Hayden area is classified as non-attainment for SO₂ and lead. The Department, therefore developed the SIPs to bring the area into attainment. As part of the SIP development process, air dispersion modeling was conducted and, based on the modeling analysis, emission limits were established for SO₂ and lead. The SIPs also establish monitoring, recordkeeping and reporting requirements for those limits. These SIPs are incorporated in the Arizona Administrative Code under R-18-2-B1301 and 1302. In addition, emission limits for lead-bearing fugitive dust from the Hayden smelter are established under R-18-2-B1301.01. These SIPs have been submitted to EPA for approval.

The requirements under these rules are State enforceable until the SIPs are approved by EPA.

The Permittee is required to comply with the emission limits for SO₂ and lead, and associated monitoring, recordkeeping and reporting requirements no later than July 1, 2018.

The requirements for lead-bearing fugitive dust becomes applicable on December 1, 2018.

VII. PREVIOUS PERMITS

The table below lists previous permits held by this facility.

TABLE 3: Previous Permits

Permit Number	Date Issued	Application Basis
M070399P1-99	May 30, 2001	Title V Renewal Permit (Concentrator)
1000042	October 9, 2001	Title V Renewal Permit (Smelter)
29282	May 26, 2004	Significant Permit Revision to Permit No. 1000042
34778	August 16, 2006	Significant Permit Revision to Permit No. 1000042
52397	October 29, 2010	Minor Permit Revision to Permit No. 1000042
54251	August 23, 2011	Minor Permit Revision to Permit No. 1000042
57403	June 6, 2013	Minor Permit Revision to Permit No. 1000042
60647	January 19, 2016	Significant Permit Revision to Permit No. 1000042
63615	April 15, 2016	Minor Permit Revision to Permit No. 1000042
66329	December 22, 2017	Significant Permit Revision to Permit No. 1000042

VIII. APPLICABLE REGULATIONS

Table 2 displays the applicable requirements for each permitted piece of equipment along with an explanation of why the requirement is applicable.

**Table 2: Verification of Applicable Regulations**

Unit	Control Device	Rule	Discussion
CONCENTRATOR			
Track Hopper Unloading operations	Wet Scrubber	A.A.C. R18-2-721 CD CV-15-02206-PHX-DLR 40 CFR 64	<p>These operations are subject to the requirements for metallic mineral processing under A.A.C. R18-2-721. The scrubber is subject to emission standards and other applicable requirements under the Consent Decree.</p> <p>Track hopper is also subject to Compliance Assurance Monitoring (CAM) requirements under 40 CFR 64.</p>
Crusher and Fine Ore Storage areas	Wet Scrubbers	A.A.C. R18-2-721 40 CFR 60 Subpart LLL CD CV-15-02206-PHX-DLR	<p>The existing facilities constructed prior to 1982 are subject to the requirements for metallic mineral processing under A.A.C. R18-2-721.</p> <p>The facilities constructed after August 24, 1982 are subject to New Source Performance Standards (NSPS) under 40 CFR 60 Subpart LL.</p> <p>These operations are also subject to the applicable requirements under the Consent Decree. Scrubbers #4 and 5 are also subject to CAM requirements under 40 CFR 64.</p>
Lime Storage and Handling operations		A.A.C. R18-2-730	These operations are subject to requirements for unclassified sources under A.A.C. R18-2-730.
SMELTER			
Concentrate Dryers/Flash Furnace Matte Tapping Operations	Vent gas baghouse, capture system for matte tapping	40 CFR 60 Subpart P 40 CFR 52.126(b) CD CV-15-02206-PHX-DLR 40 CFR 63 Subpart EEEEEEE 40 CFR 63 Subpart QQQ 40 CFR 64	<p>These operations are subject to the NSPS requirements under 40 CFR 60 Subpart P. Current operations are subject to National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR 63 Subpart EEEEEEE and all the applicable requirements under the Consent Decree as identified in Attachment "D" of the permit. After the effective date to be determined by the Permittee, the Permittee is required to comply with the NESHAP requirements under 40 CFR 63 Subpart QQQ as identified in Attachment "E".</p> <p>New vent gas baghouse is subject to CAM requirements under 40 CFR 64 until PM CEMS are established for this stream.</p>



Unit	Control Device	Rule	Discussion
Flash Furnace, Converters	Acid plant, primary and secondary capture systems, tertiary ventilation system, baghouses	40 CFR 60 Subpart P 40 CFR 52.126(b) CD CV-15-02206-PHX-DLR 40 CFR 63 Subpart EEEEEEE 40 CFR 63 Subpart QQQ 40 CFR 61 Subpart N (Arsenic) A.A.C. R18-2-715 A.A.C. R18-2-B1302 (State SO ₂ rule) A.A.C. R18-2-B1301 and B1301.01 (State Lead rules) 40 CFR 64 (CAM) 40 CFR 52.145(l) –Regional Haze	<p>Flash furnace and new converters are subject to the NSPS requirements under 40 CFR 60 Subpart P. Current operations are subject to the NESHAP requirements under 40 CFR 63 Subpart EEEEEEE and all the applicable requirements under the Consent Decree as identified in Attachment “D” of the permit. After the effective date to be determined by the Permittee, the Permittee is required to comply with the NESHAP requirements under 40 CFR 63 Subpart QQQ as identified in Attachment “E”.</p> <p>Effective July 1, 2018, the SO₂ and lead emissions are subject to A.A.C. R18-2-B1302 (State SO₂ rule), and A.A.C. R18-2-B1301 & B1301.01 (State Lead rules).</p> <p>Acid plant tail gas, and Secondary hood baghouse streams are subject to CAM requirements until PM CEMS are established for these streams.</p> <p>These operations are also subject to arsenic rate monitoring requirements under 40 CFR 61 Subpart O.</p> <p>Existing converters are subject to Regional Haze FIP requirements under 40 CFR 52.145(l).</p>
Anode Furnace/Anode Casting Operations	Baghouse	A.A.C. R18-2-715 40 CFR 52.126(b) CD CV-15-02206-PHX-DLR 40 CFR 64 40 CFR 52.145(l) –Regional Haze	<p>These operations are subject to the requirements under A.A.C. R18-2-715, 40 CFR 52.126(b) and all the applicable requirements under the Consent Decree as identified in Attachment “D” and “E” of the permit.</p> <p>Anode furnace baghouse is subject to CAM requirements under 40 CFR 64 until PM CEMS are established for this stream.</p> <p>Anode furnaces are subject to Regional Haze FIP requirements under 40 CFR 52.145(l).</p>



Unit	Control Device	Rule	Discussion
Brick Crusher	Baghouse	A.A.C. R18-2-715 CD CV-15-02206-PHX-DLR	Brick crusher operations are subject to the requirements under A.A.C. R18-2-715 and all the applicable requirements under the Consent Decree as identified in Attachment "D" and "E" of the permit.
Material Handling operations	Water sprays, wind fence	A.A.C. R18-2-715 CD CV-15-02206-PHX-DLR	Material handling operations are subject to the requirements under A.A.C. R18-2-715 and all the applicable requirements under the Consent Decree as identified in Attachment "D" and "E" of the permit.
Smithco Operations	Water sprays, wind fence	40 CFR 60 Subpart LL 40 CFR 60 Subpart OOO CD CV-15-02206-PHX-DLR	<p>40 CFR 60 Subpart LL is applicable to all reverts crushing operations.</p> <p>A.A.C. R9-3-522 is applicable to all silica flux crushing operations constructed prior to 1982.</p> <p>40 CFR 60 Subpart OOO is applicable to all silica flux crushing operations constructed after August 31, 1983, with additional requirements applying to equipment constructed on or after April 22, 2008.</p> <p>Requirements under the Consent Decree apply as identified in Attachment "H" of the permit.</p>
FACILITY-WIDE REQUIREMENTS			
Acid Plant Preheater, Natural Gas-Fired Boilers, Water Heaters, Space Heaters, and Truck Wash Burners		A.A.C. R18-2-724	<p>These natural gas/propane fired equipment are subject to the requirements under A.A.C. R18-2-724.</p> <p>As the facility is not a major source for HAPs, these gas-fired equipment are not subject to NESHAP requirements.</p>
Engines (non-emergency and emergency)		A.A.C. R18-2-724 40 CFR 63 Subpart ZZZZ 40 CFR 60 Subpart IIII 40 CFR 60 Subpart JJJJ	<p>Existing diesel engines are subject to A.A.C. R18-2-724 and NESHAP 40 CFR 63 Subpart ZZZZ.</p> <p>New emergency diesel engines are subject to NSPS Requirements under 40 CFR 60 Subpart IIII.</p> <p>New emergency spark ignition engines are subject to NSPS Requirements under 40 CFR 60 Subpart JJJJ.</p>



Unit	Control Device	Rule	Discussion
Gasoline Storage Tanks/Gasoline Dispensing facility		A.A.C. R18-2-710 40 CFR 63 subpart CCCCCC	Gasoline storage tanks are subject to requirements under A.A.C. R18-2-710. Gasoline dispensing facility at area sources are subject to 40 CFR 63 subpart CCCCCC.
Sulfuric Acid Tanks		A.A.C. R18-2-730	These tanks are subject to requirements for unclassified sources under A.A.C. R18-2-730.
Cooling Towers		A.A.C. R18-2-730	All cooling towers are subject to requirements for unclassified sources under A.A.C. R18-2-730.
Fugitive dust sources	Water Trucks, Water sprays, Wind Fences, Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2-702 CD CV-15-02206-PHX-DLR	All fugitive dust sources at the facility are subject to the requirements under A.A.C. R18-2 Article 6. The facility is also subject to applicable fugitive dust requirements in accordance with the Fugitive Dust Plan as required under the Consent Decree.
Abrasive Blasting	Wet blasting; Dust collecting equipment; Other approved methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	This standard is applicable to any spray painting operation.
Demolition/renovation operations	N/A	A.A.C. R18-2-1101.A.8 40 CFR 61, Subpart M	This standard is applicable to any asbestos related demolition or renovation operations.

IX. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
AAC	Ambient Air Concentration
ADEQ	Arizona Department of Environmental Quality
AQD	Air Quality Division
CAM	Compliance Assurance Monitoring
CD	Consent Decree
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
COMS	Continuous Opacity Monitoring System
CRP	Converter Retrofit Project
EPA	Environmental Protection Agency
HAP	Hazardous Air Pollutant
NO _x	Nitrogen Oxide



NESHAPS	National Emission standards for Hazardous Air Pollutants
NSPS	New Source Performance Standards
Pb	Lead
PM ₁₀	Particulate Matter Nominally less than 10 Micrometers
PTE	Potential-to-Emit
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
TPY	Tons per Year
VOC	Volatile Organic Compound

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