



Katie Hobbs  
Governor

# Arizona Department of Environmental Quality



Karen Peters  
Deputy Director

**Submitted online via EPA's Central Data Exchange, State Plan Electronic Collection System (SPeCS)**

September 12, 2024

Martha Guzman, Regional Administrator  
U.S. Environmental Protection Agency, Region IX  
Mail Code ORA-1  
75 Hawthorne Street  
San Francisco, CA 94105

RE: Submittal of the Arizona Department of Environmental Quality's SIP revision: 2024 Hayden Sulfur Dioxide Nonattainment Area for the 2008 Lead (Pb)

Dear Administrator Guzman:

The Arizona Department of Environmental Quality (ADEQ) hereby adopts and submits to the U.S. Environmental Protection Agency (EPA) the enclosed *Arizona State Implementation Plan Revision: 2024 Hayden Lead (Pb) Nonattainment Area for 2008 Pb NAAQS*, as a revision to the Arizona State Implementation Plan (SIP). ADEQ makes this submission pursuant to Arizona Revised Statutes (A.R.S.) §§ 49-104, 49-106, 49-404, 49-406, 49-425, and 49-426 and the Code of Federal Regulations (CFR) Title 40, Part 51.

The purpose of this SIP revision is intended to satisfy CAA requirements and show attainment of the 2008 Pb National Ambient Air Quality Standard for the Hayden Pb Planning Area. On March 3, 2017 ADEQ submitted *SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 Final* to demonstrate attainment of the 2008 Lead NAAQS by the statutory attainment date of October 3, 2019. EPA approved the plan and associated control measures in 2018.<sup>1</sup> On January 31, 2022, EPA published a finding of failure to attain the 2008 Pb NAAQS by the October 3, 2019 attainment date.<sup>2</sup> This action established a new attainment date and requires the submittal of a new SIP revision meeting the requirements of CAA sections 110 and 172, including the nonattainment plan provisions of section 172(c). The new plan must include any new measures necessary to demonstrate attainment of the Pb NAAQS by January 31, 2027.

This document summarizes the progress of the Hayden area in reducing Pb emissions and demonstrates that all CAA requirements for Pb nonattainment areas have been satisfied. The enclosed SIP revision shows that the area will attain the Pb NAAQS by the applicable January 31, 2027 attainment date.

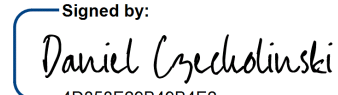
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<sup>1</sup> See 83 FR 7614 (February 22, 2018), 83 FR 56734 (November 14, 2018), and 83 FR 56736 (November 14, 2018).

<sup>2</sup> See 87 FR 4805 (January 31, 2022).

This letter and the attached enclosures will be delivered to EPA through the SPeCS submittal system pursuant to 40 CFR § 51.103(a). ADEQ requests that EPA review and approve this plan revision into the Arizona SIP. If you have any questions, please contact Kelly MacKenzie, Section Manager, Air Quality Improvement Planning Section, Air Quality Division, at (602) 784-1603 or [mackenzie.kelly@azdeq.gov](mailto:mackenzie.kelly@azdeq.gov).

Sincerely,

Signed by:  
  
4D858E29B49B4E2  
Daniel Czecholinski, CHMM  
Director, Air Quality Division

Enclosures (2)

cc: Matt Lakin  
Anita Lee  
Ashley Graham  
Charlotte Withey  
Rynda Kay  
Ben Leers



# Memorandum

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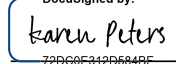
**Date:** February 28, 2023  
**To:** Daniel Czecholinski, Air Quality Division Director  
**From:** Karen Peters, Director  
**Subject:** Air Quality Division Delegation of Authority

---

Under A.R.S. §49-104 (D) (2), I authorize you, Daniel Czecholinski, Division Director, Air Quality Division, Arizona Department of Environmental Quality, to perform any act, including execution of any pertinent documents, which I, as Director of the Arizona Department of Environmental Quality, am authorized or required to do by law with Respect to A.R.S Title 49, Chapters 1 and 3 and any other acts related to air quality including personnel actions.

This authority shall remain in effect until it is revoked or upon your separation from the Arizona Department of Environmental Quality. You may further delegate this authority in the best interest of the agency, however, those delegations must be in writing and you must forward a copy of any further delegations to me.

This delegation is effective as of February 28, 2023, and revokes all earlier delegations. I ratify all acts performed by you as Air Quality Division Director concerning the duties and functions in this delegation memorandum.

DocuSigned by:  
  
72D60E912D6848F...  
Karen Peters  
Director

3/1/2023

Date



**State Implementation Plan Revision:  
2024 Hayden Lead (Pb)  
Nonattainment Area for 2008 Pb  
NAAQS**

Air Quality Division  
September 12, 2024

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## Completeness Criteria

### (40 CFR Part 51, Appendix V, Section 2.0)

#### Appendix V Section 2.1 - Administrative Materials

**(a) A formal signed, stamped, and dated letter of submittal from the Governor or his designee, requesting EPA approval of the plan or revision thereof (hereafter “the plan”). If electing to submit a paper submission with a copy in electronic version, the submittal letter must verify that the electronic copy provided is an exact duplicate of the paper submission.**

See the cover letter for this State Implementation Plan (SIP) submission signed by ADEQ Air Quality Director Daniel Czecholinski. Also included with the cover letter is a delegation of authority from Karen Peters, Deputy Director of the Arizona Department of Environmental Quality (ADEQ), to Daniel Czecholinski. This delegation gives Mr. Czecholinski the authority to perform any act the ADEQ Deputy Director is authorized to perform under the state air quality statutes, including the submission of SIPs to EPA.

**(b) Evidence that the State has adopted the plan in the State code or body of regulations; or issued the permit, order, consent agreement (hereafter “document”) in final form. That evidence shall include the date of adoption or final issuance as well as the effective date of the plan, if different from the adoption/issuance date.**

Appendix C contains a copy of the final permit revision for the Hayden smelter.

**(c) Evidence that the State has the necessary legal authority under State law to adopt and implement the plan.**

Arizona is authorized to adopt and implement SIP revisions under Arizona Revised Statutes (A.R.S.) §§ 49-104, 49-106, 49-402, 49-404, 49-406, 49-425, and 49-426. Copies of these statutes are included for reference in this SIP revision submittal in Appendix F.

**(d) A copy of the actual regulation, or document submitted for approval and incorporation by reference into the plan, including indication of the changes made (such as redline/strikethrough) to the existing approved plan, where applicable. The submission shall include a copy of the official State regulation/document, signed, stamped, and dated by the appropriate State official indicating that it is fully enforceable by the State. The effective date of any regulation/document contained in the submission shall, whenever possible, be indicated in the regulation/document itself; otherwise the State should include a letter signed, stamped, and dated by the appropriate State official indicating the effective date. If the regulation/document provided by the State for approval and incorporation by reference into the plan is a copy of an existing publication, the State submission should, whenever possible, include a copy of the publication cover page and table of contents.**

Table 1-1 shows the final permit revisions being adopted and rule provisions being replaced by this SIP Revision. As mentioned above in (b), this SIP revision contains the final permit revision.

**(e) Evidence that the State followed all of the procedural requirements of the State’s laws and constitution in conducting and completing the adoption/issuance of the plan.**

Appendix E contains the public process documentation showing that the State followed all requirements regarding adoption and issuance of the plan.

**(f) Evidence that public notice was given of the proposed change consistent with procedures approved by EPA, including the date of publication of such notice.**

Proof that ADEQ gave notice of the SIP Revision in accordance with A.R.S. § 49-444 is attached as Appendix E.

**(g) Certification that public hearing(s) were held in accordance with the information provided in the public notice and the State's laws and constitution, if applicable and consistent with the public hearing requirements in 40 CFR 51.102.**

The certification and other documents related to the public hearing are attached as Appendix E.

**(h) Compilation of public comments and the State's response thereto.**

Public comments and ADEQ's responsiveness summary are attached as Appendix E.

## Appendix V Section 2.2 - Technical Support

**(a) Identification of all regulated pollutants affected by the plan.**

This SIP revision applies to the 2008 Lead (Pb) National Ambient Air Quality Standard (NAAQS).

**(b) Identification of the locations of affected sources including the EPA attainment/nonattainment designation of the locations and the status of the attainment plan for the affected areas(s).**

Identification of the locations and sources affected by this plan are included in Chapters 1, 2, and 3. Information is also contained in the Hayden Pb Emissions Inventory (EI) Technical Support Document (TSD) (Appendix A) and Hayden Pb Modeling TSD (Appendix B). This SIP revision is applicable to the Hayden Pb nonattainment area (NAA) for the 2008 Pb NAAQS.

**(c) Quantification of the changes in plan allowable emissions from the affected sources; estimates of changes in current actual emissions from affected sources or, where appropriate, quantification of changes in actual emissions from affected sources through calculations of the differences between certain baseline levels and allowable emissions anticipated as a result of the revision.**

The Hayden Pb Emissions Inventory TSD (Appendix A) contains the technical documentation and a detailed emissions inventory.

**(d) The State's demonstration that the national ambient air quality standards, prevention of significant deterioration increments, reasonable further progress demonstration, and visibility, as applicable, are protected if the plan is approved and implemented. For all requests to redesignate an area to attainment for a national primary ambient air quality standard, under section 107 of the Act, a revision must be submitted to provide for the maintenance of the national primary ambient air quality standards for at least 10 years as required by section 175A of the Act.**

The Hayden Pb Modeling TSD (Appendix B) contains the attainment demonstration for the 2008 Pb NAAQS.

**(e) Modeling information required to support the proposed revision, including input data, output data, models used, justification of model selections, ambient monitoring data used, meteorological data used, justification for use of offsite data (where used), modes of models used, assumptions, and other information relevant to the determination of adequacy of the modeling analysis.**

Modeling information and the technical demonstration is contained in Appendix B.

**(f) Evidence, where necessary, that emission limitations are based on continuous emission reduction technology.**

The control strategy is discussed in Chapter 4 of the SIP revision. A copy of the final permit revision is located in Appendix C, and includes numerical fugitive emissions limits for the copper smelter in the nonattainment area. The permit contains particular work practice standards and recordkeeping/reporting requirements to ensure compliance with the emission limit and to ensure attainment of the 2008 Pb NAAQS.

**(g) Evidence that the plan contains emission limitations, work practice standards and recordkeeping/reporting requirements, where necessary, to ensure emission levels.**

The control strategy is discussed in Chapter 4 of the SIP revision. A copy of the final permit revision is located in Appendix C, and includes numerical fugitive emissions limits for the copper smelter in the nonattainment area. The permit contains particular work practice standards and recordkeeping/reporting requirements to ensure compliance with the emission limit and to ensure attainment of the 2008 Pb NAAQS.

**(h) Compliance/enforcement strategies, including how compliance will be determined in practice.**

Chapter 4 contains a summary and description of the permit revision regarding the requirements for compliance/enforcement strategies as well as a discussion of compliance is determined.

**(i) Special economic and technological justifications required by any applicable EPA policies, or an explanation of why such justifications are not necessary.**

Chapter 4 discusses the need to vary from the use of CEMS to monitor fugitive emissions.

# 1 INTRODUCTION

Chapter 1 describes the purpose of this State Implementation Plan (SIP) Revision, summarizes the National Ambient Air Quality Standards (NAAQS or “standards”) for lead (Pb), and presents regulatory requirements for Pb nonattainment areas. This chapter also provides a regulatory history of the Hayden nonattainment area (NAA), as well as a description of the physical geography and the economy of the area.

## 1.1 Statement of Introduction and Purpose

Pursuant to Clean Air Act (CAA) Section 107(d), the U.S. Environmental Protection Agency (EPA) redesignated the Hayden area, located in portions of southern Gila and eastern Pinal counties, Arizona, from “unclassifiable” to “nonattainment” for the 2008 National Ambient Air Quality Standards (NAAQS) for lead (Pb). EPA based its redesignation of the area on recorded violations of the Pb standards at the Globe Highway monitoring site, located near the towns of Hayden and Winkelman, Arizona.<sup>1</sup>

Under the authority granted by the Governor and the State of Arizona, the Arizona Department of Environmental Quality (ADEQ) is responsible for the preparation and submittal of State Implementation Plan revisions for the Hayden area.<sup>2</sup>

On March 3, 2017 ADEQ submitted *SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 Final* to demonstrate attainment of the 2008 Lead NAAQS by the statutory attainment date of October 3, 2019. EPA approved the plan and associated control measures in 2018.<sup>3</sup> On January 31, 2022, EPA published a finding of failure to attain the 2008 Pb NAAQS by the October 3, 2019 attainment date.<sup>4</sup> This action established a new attainment date and requires the submittal of a new SIP revision meeting the requirements of CAA sections 110 and 172, including the nonattainment plan provisions of section 172(c). The new plan must include any new measures necessary to demonstrate attainment of the Pb NAAQS by January 31, 2027.

This document summarizes the progress of the Hayden area in reducing Pb emissions and demonstrates that all CAA requirements for Pb nonattainment areas have been satisfied. The enclosed analyses show that the area will attain the Pb NAAQS by the applicable January 31, 2027 attainment date. With this submittal, ADEQ requests that EPA approve the attainment plan for the Hayden 2008 Pb nonattainment area.

## 1.2 Control Measures to be Added to the SIP

Table 1-1 lists the new control measures submitted for approval as a component of the Arizona SIP. ADEQ and the American Smelting and Refining Company LLC (ASARCO) developed new measures for the control of Pb emissions from the Hayden primary copper smelter to demonstrate attainment of the Pb NAAQS by

<sup>1</sup> See 79 FR 52205 (September 3, 2014).

<sup>2</sup> See Arizona Revised Statutes (A.R.S.) §§ 49-401, 402, 404, and 406.

<sup>3</sup> See 83 FR 7614 (February 22, 2018), 83 FR 56734 (November 14, 2018), and 83 FR 56736 (November 14, 2018).

<sup>4</sup> See 87 FR 4805 (January 31, 2022).

January 31, 2027. ADEQ incorporated these measures into ASARCO's Hayden Operations Class I Air Quality Permit (Permit No. 39948 as amended by Significant Permit Revision (SPR) No. 97168).

The proposed permit revision was posted on May 24, 2024, opening a public comment period. A public hearing was held on June 24, 2024. The elements of the final permit, as listed in Table 1-1, submitted to EPA for inclusion in the SIP are contained in Appendix C and discussed in Chapter 4 of this document.

**Table 1-1 Measures to Be Added to SIP**

| Control Measures Added                                                               | SIP Measures Replaced |
|--------------------------------------------------------------------------------------|-----------------------|
| SPR No. 97168, Attachment I:<br><i>Hayden Smelter Site-Specific Sip Requirements</i> | None                  |
| <i>Appendix 1 Of Attachment I</i>                                                    | None                  |

### 1.3 National Ambient Air Quality Standards

Title I of the CAA requires EPA to set NAAQS for those pollutants that are considered harmful to both public health and the environment. Standards are set for six air pollutants: ground-level ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. EPA sets two types of NAAQS, a primary standard and a secondary standard. Primary standards are set to protect human health and secondary standards are established to protect public welfare, including protection of visibility and prevention of damage to animals, crops, vegetation, and buildings.<sup>5</sup>

The standard for each pollutant is set at a maximum concentration measured in either parts per million (ppm) or parts per billion (ppb) or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). Each standard also has a distinct averaging time in order to provide the necessary level of protection. These standards are periodically reevaluated and are either retained or revised based on review of scientific literature and analyses.<sup>6</sup>

### 1.4 National Ambient Air Quality Standards for Lead

The EPA set primary and secondary NAAQS for Pb because of adverse effects on human health as well as the environment, including animal and plant life. Lead is a heavy metal that occurs naturally in the environment. Lead emissions can also be a byproduct of various manufacturing processes.

Major sources of Pb emissions in air include ore and metals processing, leaded aviation gasoline, lead-acid battery manufacturing and other industrial processes. Lead may persist in the environment for long periods of time because it does not decompose in soil after deposition. Lead adversely impacts ecosystems by contributing to biodiversity loss through reduced reproduction and growth rates in plants and animals.<sup>7</sup>

<sup>5</sup> See U.S. Environmental Protection Agency. (n.d.). *NAAQS Table*. Retrieved September 6, 2022, from <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

<sup>6</sup> See CAA section 109 (42 U.S.C. 7409 [2015]).

<sup>7</sup> U.S. EPA. (n.d.). *Lead in Outdoor Air*. Retrieved September 26, 2022, from <https://www.epa.gov/lead/lead-outdoor-air>

In humans, exposure to Pb can have adverse effects on multiple organ systems, including neurological, reproductive, kidney, cardiovascular and immune systems. Lead may be inhaled or ingested through contact with contaminated air, soil, or water. Once the pollutant enters the body via the respiratory or gastrointestinal system, it is absorbed into the bloodstream and distributed throughout multiple organs. Lead may bioaccumulate in bones and soft tissues, causing persistent, long-term health problems. Lead bioaccumulation is more common in children due to rapid bone growth and replacement. Exposure to relatively low levels of Pb in children can have permanent adverse effects on neurological development, including reduced motor function, learning deficits, and lowered IQ.<sup>8</sup>

In 1978, the level of the Pb NAAQS were set at 1.5 µg/m<sup>3</sup>, not to be exceeded by the maximum arithmetic mean concentration averaged over a calendar quarter.<sup>9</sup> In 2008, in order to better protect public health and welfare, EPA strengthened the primary (and secondary) NAAQS to 0.15 µg/m<sup>3</sup>. The period of measurement was also changed from the calendar quarter basis in the 1978 standard to a three-month rolling average (not to be exceeded) form, evaluated over a three-year period.

Planning and control requirements for the 1978 Pb NAAQS were revoked one year after area designations for the 2008 Pb NAAQS (from the effective date of the new designation). In areas designated nonattainment for the 1978 NAAQS, that standard applied until the State submitted, and EPA approved, a SIP revision providing for attainment of the 2008 standard.<sup>10</sup> Because of revocation procedures for the 1978 primary Pb NAAQS and the absence of any nonattainment areas designated for that standard in Arizona, no planning requirements remain in the State for the 1978 Pb NAAQS.

On September 16, 2016, based review of the air quality criteria for Pb, EPA issued a decision to retain the existing 2008 standards without revision.<sup>11</sup> Table 1-2 shows historical and current Pb standards.

**Table 1-2 Lead National Ambient Air Quality Standards**

| Lead National Ambient Air Quality Standards |                                                                                     |                        |                  |                        |                    |
|---------------------------------------------|-------------------------------------------------------------------------------------|------------------------|------------------|------------------------|--------------------|
| Final Rule                                  | Primary/Secondary                                                                   | Indicator <sup>a</sup> | Averaging Time   | Level <sup>b</sup>     | Form               |
| <b>1978<sup>c</sup></b>                     | Primary & Secondary                                                                 | Pb-TSP                 | Calendar Quarter | 1.5 µg/m <sup>3</sup>  | Not to be exceeded |
| <b>1991</b>                                 | Agency released multimedia “ <a href="#">Strategy for Reducing Lead Exposures</a> ” |                        |                  |                        |                    |
| <b>2008<sup>d</sup></b>                     | Primary & Secondary                                                                 | Pb-TSP                 | 3-month period   | 0.15 µg/m <sup>3</sup> | Not to be exceeded |
| <b>2016<sup>e</sup></b>                     | Primary & secondary standards retained, without revision.                           |                        |                  |                        |                    |

Source: U.S. Environmental Protection Agency. (n.d.). *Timeline of Lead (Pb) National Ambient Air Quality Standards (NAAQS)*. Retrieved September 26, 2022, from <https://www.epa.gov/lead-air-pollution/timeline-lead-pb-national-ambient-air-quality-standards-naaqs>

<sup>a</sup> Pb-TSP = Lead in total suspended particles.

<sup>b</sup> Units of measure are micrograms per cubic meter of air (µg/m<sup>3</sup>).

<sup>c</sup> 43 FR 46246 (October 5, 1978).

<sup>d</sup> 73 FR 66964 (November 12, 2008).

<sup>e</sup> 80 FR 278 (October 18, 2016).

<sup>8</sup> U.S. EPA. (n.d.). *Lead Air Pollution*. Retrieved September 26, 2022, from <https://www.epa.gov/lead-air-pollution>

<sup>9</sup> 1977 Air Quality Criteria for Lead (U.S. EPA, 1977).

<sup>10</sup> See 73 FR 66964 (November 12, 2008).

<sup>11</sup> U.S. EPA. (n.d.). *NAAQS for Lead (Pb)*. Retrieved September 26, 2022, from <https://www.epa.gov/lead-air-pollution/national-ambient-air-quality-standards-naaqs-lead-pb>

## 1.5 Hayden Area Regulatory Background

### **2008 Pb NAAQS Nonattainment Designation**

In 2008 EPA revised the Lead NAAQS, strengthening the level of the primary and secondary standards from 1.5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) to  $0.15 \mu\text{g}/\text{m}^3$ .<sup>12</sup> EPA based this decision on new data that concluded a lower threshold was necessary to protect human health and welfare.

Pursuant to CAA section 107(d)(1)(A), Arizona was required to submit boundary recommendations for areas of the state that meet (attainment), do not meet (nonattainment), or cannot be classified for the 2008 primary NAAQS. On December 15, 2009, Arizona submitted boundary recommendations for the state including a request that EPA delay a decision on the designation of nine townships centered on the Hayden primary copper smelter to provide additional time to collect ambient air quality data. EPA's initial response was to designate the Hayden Planning Area as unclassifiable and designated the rest of the State as unclassifiable/attainment until further data could be gathered to make a final determination for the Hayden area.<sup>13</sup>

CAA section 107(d)(3) authorizes EPA to revise designations on the basis of any new air quality related considerations that it deems appropriate. On April 21, 2014, EPA notified the State that a Pb NAAQS violation had been measured in the Hayden planning area, and consequently, the area would be redesignated from unclassifiable to nonattainment.<sup>14</sup> EPA redesignated the Hayden planning area as nonattainment for the 2008 Lead NAAQS, effective October 3, 2014. The boundaries of the planning area were defined in accordance with the State's original recommendations, matching those of the 2010 Sulfur Dioxide NAA.<sup>15</sup>

### **SIP Submittals**

#### Infrastructure SIP (I-SIP)

CAA section 110(a)(1) requires states to submit SIPs within three years following the promulgation of new or revised NAAQS to provide for implementation, maintenance, and enforcement of such standards. Each of these SIPs must address certain basic elements or the "infrastructure" of its air quality management programs under CAA section 110(a)(2)(A) through (M). These elements include, but are not limited to, provisions for establishment and operation of ambient monitoring, public and local agency participation in air quality planning, and operation of permitting programs. The provisions of section 110(a)(2) are primarily general program requirements applicable to all areas of the state.

On October 14, 2011 ADEQ submitted *Arizona State Implementation Plan Revision under Clean Air Act Section 110(a)(1) and (2): Implementation of the 2008 Lead National Ambient Air Quality Standard*. Certain required permitting-related elements and demonstrations of authority to conduct air quality modeling

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<sup>12</sup> See 73 FR 66964 (November 12, 2008).

<sup>13</sup> See 76 FR 72105 (November 22, 2011).

<sup>14</sup> See Letter from Jared Blumenfeld, Administrator, EPA Region 9, to Janice K. Brewer, Governor of Arizona regarding EPA's intent to redesignate the Hayden Pb planning area to nonattainment (April 21, 2014).

<sup>15</sup> See 79 FR 52205 (September 3, 2014).

were addressed in subsequent submittals. EPA approved most elements of Arizona's infrastructure plan in several separate actions.<sup>16</sup>

### Nonattainment Area Plan

Designation of the Hayden area as nonattainment for the 2008 Pb NAAQS in 2014 triggered CAA requirements under Section 110 and Title I, Part D for the State to submit a SIP revision to demonstrate how the area will attain the 2008 Pb NAAQS. On March 3, 2017, ADEQ submitted *SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 Final* to demonstrate attainment of the 2008 Lead NAAQS in the Hayden planning area by the statutory attainment date of October 3, 2019. EPA approved the plan and associated control measures in 2018.<sup>17</sup>

### ***Finding of Failure to Attain***

On January 31, 2022 EPA published a finding of failure to attain the 2008 Pb standards by the October 3, 2019 attainment date.<sup>18</sup> This action established a new attainment date and requires the submittal of a new SIP revision, by January 31, 2023, meeting the requirements of CAA sections 110 and 172, including the nonattainment plan provisions of section 172(c). The new plan must include any new measures determined necessary to demonstrate attainment of the Pb NAAQS by January 31, 2027. The required SIP revision is the subject of this document.

### ***Sources of Pb in the Hayden Planning Area***

Source categories of lead emissions within the Hayden nonattainment area include mobile nonroad, area, and point sources. Mobile nonroad sources comprise modes of transportation that continue to use leaded fuels, such as piston-engine aircraft. Area sources of lead are related to the storage and transport of gasoline, miscellaneous industrial sources, and miscellaneous non-industrial sources. Finally, the point source category is limited to one source, the ASARCO primary copper smelter found in the Town of Hayden. The SIP revision focuses primarily on the ASARCO smelter, the largest source of Pb emissions in the area.

Lead emissions are a potential byproduct of metal ore smelting and processing. Smelting and mining activities have taken place in the Hayden NAA for over 100 years, with the Hayden primary copper smelter processing ores from the nearby Ray Mine as early as 1912. Beginning in 1958, the Hayden smelter began processing ores from various mine sites across the State. In 1999/2000 Grupo Mexico, a mining company with headquarters in Mexico, acquired ASARCO, and the company now operates as a U.S. subsidiary of Grupo Mexico.<sup>19</sup>

In 2008 following a finding of soil contamination from historical mining and smelting activities in the area, ASARCO, under EPA Superfund and ADEQ direction, began remediation efforts at several sites in Hayden and the nearby Town of Winkelman. A 2010 Administrative Order on Consent between ASARCO, ADEQ,

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<sup>16</sup> EPA's actions on Arizona's Infrastructure SIP for the 2008 Pb NAAQS are contained in the following final rules: 80 FR 40905 (July 14, 2015), 80 FR 47859 (August 10, 2015), 87 FR 19631 (May 4, 2018), and 83 FR 42214 (August 21, 2018).

<sup>17</sup> See 83 FR 7614 (February 22, 2018), 83 FR 56736 (November 14, 2018), and 83 FR 56734 (November 14, 2018).

<sup>18</sup> See 87 FR 4805 (January 31, 2022).

<sup>19</sup> See ASARCO. (n.d.). *About Us*. Retrieved December 2, 2022 from <https://www.asarco.com/history/>

and EPA required ASARCO to continue soil, water, and air remediation and monitoring efforts at the site; those activities are ongoing as of 2022.<sup>20</sup>

Smelter operations were originally permitted as a major source of criteria pollutants and minor source for hazardous air pollutants. During ADEQ's permit review and renewal process in November 2011, EPA concluded that the smelter should instead be classified as a major source of hazardous air pollutants and issued a Finding of Violation against ASARCO. This finding of violation resulted in a settlement with EPA (Consent Decree), finalized December 30, 2015, intended to address any additional required provisions in the facility's Class I permit.<sup>21</sup>

The Hayden smelter is currently operating under a permit issued by ADEQ in April 2018.<sup>22</sup> This permit is a Class I major source operating permit in accordance with Title V of the CAA. The 2018 permit renewal for the facility incorporates control technologies used to comply with the Consent Decree.

## 1.6 Hayden NAA Description

Sections 1.6.1 through 1.6.4 describe the boundary, geography and climate, demographics, and economy of the Hayden planning area to provide additional context for this SIP revision.

### 1.6.1 Hayden NAA Boundary

Pursuant to section 107(d) of the CAA, EPA, with input from the States, designates areas as either nonattainment, attainment, or unclassifiable for each NAAQS. The CAA defines a nonattainment area as any area that exceeds the NAAQS for a given pollutant or contributes to ambient air quality in a nearby area that does not meet the NAAQS. EPA designated portions of Gila County and Pinal County as nonattainment for the 2008 Pb standard in 2014.<sup>23</sup> The current boundary of the Hayden Pb nonattainment area is codified in 40 CFR 81.303 and summarized in Table 1-3 below.

**Table 1-3 Hayden, AZ 2008 Lead NAAQS Nonattainment Area Boundary**

| Hayden, AZ 2008 Lead NAAQS Nonattainment Area Description (township and range) |                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| County                                                                         | Designated Area                                                                                                                                                                                                                                                                                                                                     |
| Gila (part)                                                                    | The portions of Gila County that are bounded by:<br>T4S, R14E; T4S, R15E; T4S, R16E; T5S, R15E; T5S, R16E                                                                                                                                                                                                                                           |
| Pinal (part)                                                                   | The portions of Pinal County that are bounded by:<br>T4S, R14E; T4S, R15E; T4S, R16E (except those portions in the San Carlos Indian Reservation);<br>T5S, R14E; T5S, R15E; T5S, R16E (except those portions in the San Carlos Indian Reservation);<br>T6S, R14E; T6S, R15E; T6S, R16E (except those portions in the San Carlos Indian Reservation) |
| Source: 40 CFR 81.303 Arizona.                                                 |                                                                                                                                                                                                                                                                                                                                                     |

<sup>20</sup> See "Case Summary: EPA Funded Sites and Communities in the ASARCO Bankruptcy Settlement" at <https://www.epa.gov/enforcement/case-summary-epa-funded-sites-and-communities-asarco-bankruptcy-settlement#hayden> and "Superfund Alternative Site | ASARCO Hayden Plant" at <http://azdeq.gov/node/1871>.

<sup>21</sup> See Consent Decree, United States of America v. ASARCO LLC, CV-15-02206-PHX-DLR (D. Ariz. 2015). A copy of the Consent Decree is available at: <https://www.epa.gov/enforcement/asarco-llc-settlement>.

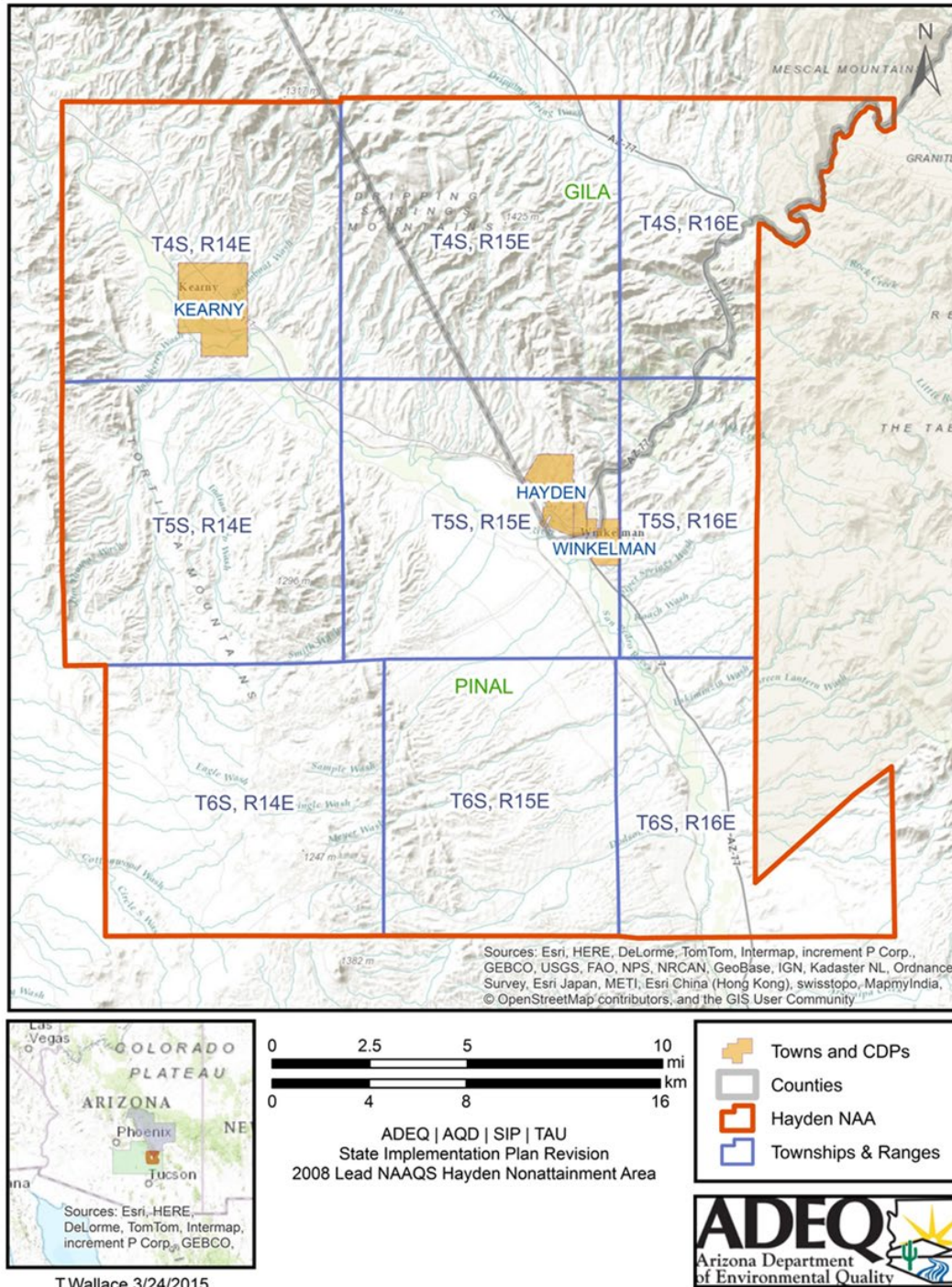
<sup>22</sup> See permit renewal No. 39948.

<sup>23</sup> See 79 FR 52205 (September 3, 2014) and 79 FR 56962 (September 24, 2014).

# State Implementation Plan Revision: 2024 Hayden Lead (Pb) Nonattainment Area for 2008 Pb NAAQS

The Hayden Lead NAA is comprised of nine whole or partial townships as illustrated in Figure 1-1.

**Figure 1-1 Map of Hayden Pb Nonattainment Area**



## 1.6.2 Geography and Climate

The Hayden Lead NAA is found within Gila and Pinal Counties in southern and central Arizona. Gila County, located in the southern portion of the state, encompasses approximately 4,752 square miles. Located in central Arizona, Pinal County, encompasses approximately 5,374 square miles. Hayden is approximately 50 miles northeast of Tucson and 35 miles south of Globe. Other towns in the NAA include Winkelman, which borders Hayden to the southeast and Kearny, located in the northwest section of the NAA.

The area is characterized by complex terrain with both desert terrain and mountain ranges across the southern Gila County and central Pinal County landscape. The mountain ranges in the area form natural boundaries that isolate the NAA from the rest of Gila and Pinal Counties. Elevations range from roughly 1,800 feet to more than 4,400 feet above sea level in the Hayden nonattainment area, with the Town of Hayden situated at an elevation near 2,050 feet above sea level.

The climate of the area is classified as hot summer, Mediterranean climate, includes both warm desert and cool alpine climates, and is characterized by dry summers and cooler, wetter winters.<sup>24</sup> Average annual temperatures in the Hayden NAA range from 84.3 degrees Fahrenheit in the summer to 46.2 degrees Fahrenheit in the winter. Annual precipitation in the NAA averages 16.22 inches. The driest time of the year is typically April through June. There are generally two distinct rain seasons in the winter and late summer. Low pressure systems and cold fronts in December produce an average monthly total of 1.64 inches of rain or snow. Monsoon wind shift with increased moisture from Mexico in August produces an average monthly total of 2.46 inches of rain.<sup>25</sup> The nonattainment area does not currently have a station available for monthly norms; however, the ADEQ Globe Highway monitor sits a half mile northeast of the smelter complex and is adjacent to the Gila River. The monitor is located in a river valley with the valley crest roughly 350 feet above the monitor elevation (see Figure 2-1). This river valley runs northeast to southwest. The Town of Winkelman is located within the nonattainment area and has the only available minimum and maximum temperature averages (for years 1961-1990), taken from the Winkelman 6S Station (see Figure 1-2).

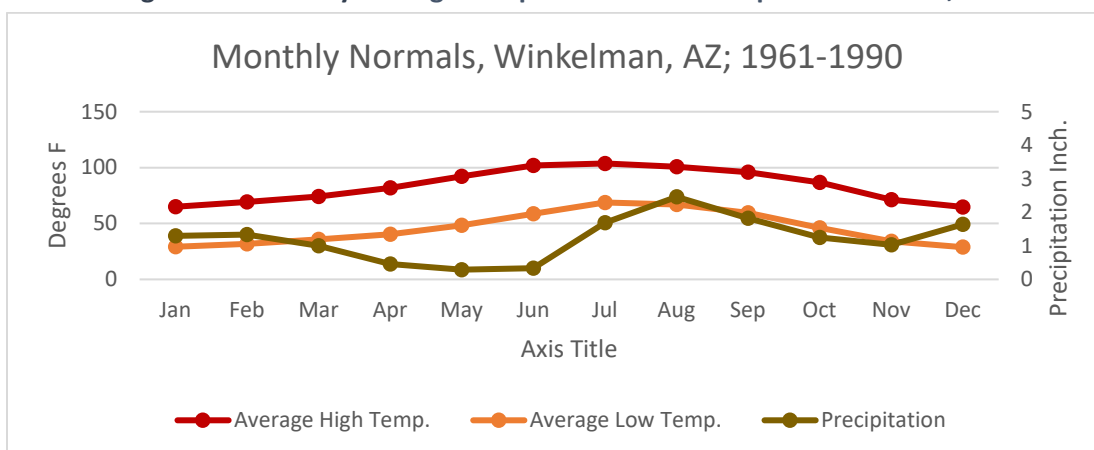
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<sup>24</sup> See Weatherbase. (n.d.). *Winkelman, Arizona*. Retrieved October 11, 2022, from

<http://www.weatherbase.com/weather/weather-summary.php3?s=524920&cityname=Winkelman%2C+Arizona%2C+United+States+of+America&units=>

<sup>25</sup> Western Regional Climate Center. (n.d.) *Winkelman 6S, Arizona (029420), Period of Record Monthly Climate Summary, Period of Record 1961 to 1990*. Retrieved July 26, 2023, from <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?az9420>

**Figure 1-2 Monthly Average Temperatures and Precipitation - Globe, AZ**



### 1.6.3 Population

The Hayden Pb NAA has been codified in 40 CFR 81.303 and is comprised of the portions of Gila County and Pinal County bound by the townships and ranges listed in Table 2-2 and represented geographically in Figure 1-1. Population estimates for the entire Hayden Pb NAA as well as the respective proportions of Gila and Pinal Counties are also presented in Table 2-2. The Hayden NAA encompasses the towns of Hayden, Winkelman and Kearny, for which population data have been included in Table 2-1.

**Table 1-4 Towns in Hayden Pb NAA**

| Hayden Pb NAA Towns <sup>26</sup> |                 |
|-----------------------------------|-----------------|
| Location                          | 2017 Population |
| Kearny                            | 1,787           |
| Hayden                            | 548             |
| Winkelman                         | 308             |

**Table 1-5 Geographic Location and Population**

| Hayden Pb Nonattainment Area <sup>27</sup> |                 |                           |                  |
|--------------------------------------------|-----------------|---------------------------|------------------|
| Land Area                                  |                 | 275 square miles          |                  |
| 2017 Population                            |                 | 4,409                     |                  |
| 2026 Projected Population                  |                 | 3,679                     |                  |
| Gila County Portion                        |                 | Pinal County Portion      |                  |
| Land Area                                  | 58 square miles | Land Area                 | 217 square miles |
| 2017 Population                            | 1,176           | 2017 Population           | 3,233            |
| 2026 Projected Population                  | 982             | 2026 Projected Population | 2,697            |

<sup>26</sup> ADOA 2017 population estimate. *Population Estimates for Arizona Counties, Incorporated Places & Balance of County*. Retrieved from: <https://www.azcommerce.com/oeo/population/population-estimates/>.

<sup>27</sup> ADOA provided land area estimates and population estimates and projections for ADEQ in an internal report.

## 1.6.4 Economy

As noted previously, the Hayden Pb NAA is located in portions of Gila County and Pinal County. Top industries in both Counties include education, healthcare and social services, retail, agriculture and mining. The copper mining industry, in particular, supports the economies of many towns located within the NAA. In 2021, around 28 percent of the civilian labor force in the Town of Hayden and 11.9 percent of the civilian labor force in the Town of Winkelman worked in occupations classified as mining, agriculture, forestry, and fishing/hunting, compared to around 8.6 percent in greater Gila County and 2.7 in greater Pinal County. (see Table 1-7).

The Hayden smelter operations, currently owned and operated by ASARCO, have a significant impact on the economies of Hayden, nearby communities in the NAA, and on Arizona's economy as a whole. Hayden operations for processing copper ores include: 27,400 ton/day concentrator, a 720,000 ton/year copper smelter, and a sulfuric acid plant. Hayden operations produce over 300 million pounds of copper annually.<sup>28</sup>

In 2012, ASARCO operations in Hayden contributed \$140.8 million in wages, salaries and benefits to local workers. Additionally, ASARCO pays royalties on minerals mined from state leases across Arizona and leases on Indian land. In 2023, ASARCO's Hayden operations employed approximately 1,700.<sup>29</sup>

Table 1-6 shows employment rates in the towns of Hayden and Winkelman, as well as Gila and Pinal Counties for 2010, 2013, and 2020. The labor force declined in Hayden, Winkelman, and Gila County in 2013 and 2020 but grew in Pinal County. Unemployment rates have recently declined in Hayden, Gila County, and Pinal County. Unemployment increased from 8 percent to 23.8 percent in Winkelman.

**Table 1-6 Labor Force**

| Civilian Labor Force for Hayden Planning Area, Arizona (# of employees) |        |        |        |
|-------------------------------------------------------------------------|--------|--------|--------|
| Employment Status                                                       | 2010*  | 2013** | 2020** |
| <b>Hayden</b>                                                           |        |        |        |
| Civilian Labor Force                                                    | 359*   | 204    | 158    |
| Unemployed                                                              | 28*    | 44     | 30     |
| Percent Unemployed                                                      | 7.8%*  | 21.6%  | 19.0%  |
| <b>Winkelman</b>                                                        |        |        |        |
| Civilian Labor Force                                                    | 184*   | 138    | 105    |
| Unemployed                                                              | 15*    | 11     | 25     |
| Percent Unemployed                                                      | 8.2%*  | 8.0%   | 23.8%  |
| <b>Gila County</b>                                                      |        |        |        |
| Civilian Labor Force                                                    | 21,664 | 21,148 | 20,355 |
| Unemployed                                                              | 2,695  | 2,050  | 1,525  |
| Percent Unemployed                                                      | 12.4%  | 9.7%   | 7.5%   |

<sup>28</sup> See "ASARCO, About Us" (2015, Sept.) Retrieved: <http://www.asarco.com/about-us/our-locations/hayden-operations/>.

<sup>29</sup> See "ASARCO, Purpose" (2023, Feb.) Retrieved: <https://www.ASARCO.com/purpose/>.

| Civilian Labor Force for Hayden Planning Area, Arizona (# of employees)                                                                                                                                                    |         |         |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------|
| Employment Status                                                                                                                                                                                                          | 2010*   | 2013**  | 2020**  |
| <b>Pinal County</b>                                                                                                                                                                                                        |         |         |         |
| Civilian Labor Force                                                                                                                                                                                                       | 154,038 | 150,007 | 187,999 |
| Unemployed                                                                                                                                                                                                                 | 16,402  | 12,187  | 13,680  |
| Percent Unemployed                                                                                                                                                                                                         | 10.6%   | 8.1%    | 7.3%    |
| *Source: U.S. Census Bureau, American Fact Finder. 2006-2010 American Community Survey, 5-Year Estimates (2010) (2015, April 29). Retrieved from <a href="http://factfinder.census.gov">http://factfinder.census.gov</a> . |         |         |         |
| ** Arizona Office of Economic Opportunity (AOEO); medium series current population. <sup>30</sup>                                                                                                                          |         |         |         |

Table 1-7 shows employment by sector for Hayden, Winkelman, Gila County, and Pinal County in 2021. Educational services, health care, and social assistance were the largest employment sectors in Gila County, Pinal County, and the town of Winkelman, while agriculture, forestry, fishing, hunting, and mining accounted for almost half of the workforce in Hayden.

<sup>30</sup> See Arizona Office of Economic Opportunity (AOEO), medium series population (<https://oeo.az.gov/>). Retrieved June 2023.

Table 1-7 Labor Force by Sector

| Labor Force by Employment Sector 2009-2013                                                                                                                                                                                                                                                                                               |                 |               |                   |               |                         |               |                           |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|-------------------|---------------|-------------------------|---------------|---------------------------|---------------|
| Employment Sector<br>(# of employees)                                                                                                                                                                                                                                                                                                    | Hayden<br>(100) |               | Winkelman<br>(59) |               | Gila County<br>(18,822) |               | Pinal County<br>(179,360) |               |
| Employment Sector                                                                                                                                                                                                                                                                                                                        | Estimate        | %<br>Employed | Estimate          | %<br>Employed | Estimate                | %<br>Employed | Estimate                  | %<br>Employed |
| Agriculture, Forestry, Fishing, Hunting, & Mining                                                                                                                                                                                                                                                                                        | 28              | 28            | 7                 | 11.9          | 1,614                   | 8.6           | 4,773                     | 2.7           |
| Construction                                                                                                                                                                                                                                                                                                                             | 0               | 0             | 0                 | 0             | 1,563                   | 8.3           | 16,460                    | 9.2           |
| Manufacturing                                                                                                                                                                                                                                                                                                                            | 20              | 20            | 6                 | 10.2          | 694                     | 3.7           | 14,833                    | 8.3           |
| Wholesale trade                                                                                                                                                                                                                                                                                                                          | 0               | 0             | 0                 | 0             | 288                     | 1.5           | 1,980                     | 1.1           |
| Retail trade                                                                                                                                                                                                                                                                                                                             | 12              | 12            | 0                 | 0             | 2,075                   | 11            | 24,143                    | 8.6           |
| Transportation, Warehousing, & Utilities                                                                                                                                                                                                                                                                                                 | 0               | 0             | 0                 | 0             | 908                     | 4.8           | 11,332                    | 6.3           |
| Information                                                                                                                                                                                                                                                                                                                              | 0               | 0             | 0                 | 0             | 207                     | 1.0           | 3,219                     | 1.8           |
| Finance, Insurance, Real Estate, Rental, & Leasing                                                                                                                                                                                                                                                                                       | 0               | 0             | 0                 | 0             | 818                     | 4.3           | 10,333                    | 5.8           |
| Professional, Scientific, Management,<br>Administrative, & Waste Management                                                                                                                                                                                                                                                              | 0               | 0             | 11                | 18.6          | 1,183                   | 6.3           | 19,583                    | 10.9          |
| Educational Svcs, Health Care, & Social Assistance                                                                                                                                                                                                                                                                                       | 10              | 10            | 35                | 59.3          | 4,875                   | 25.9          | 36,464                    | 20.3          |
| Arts, Entertainment, Recreation, Accommodation,<br>& Food Svcs                                                                                                                                                                                                                                                                           | 18              | 18            | 0                 | 0             | 2,552                   | 13.6          | 15,462                    | 8.6           |
| Other Svcs (except public administration)                                                                                                                                                                                                                                                                                                | 0               | 0             | 0                 | 0             | 600                     | 3.2           | 7,832                     | 4.4           |
| Public Administration                                                                                                                                                                                                                                                                                                                    | 12              | 12            | 0                 | 0             | 1,463                   | 7.8           | 12,946                    | 7.2           |
| Source: U.S. Census Bureau, American Fact Finder. (2023, February 1). Retrieved from<br><a href="https://data.census.gov/table?t=Employment+and+Labor+Force+Status:Industry&amp;g=05000000US04007">https://data.census.gov/table?t=Employment+and+Labor+Force+Status:Industry&amp;g=05000000US04007</a> . 2021 American Community Survey |                 |               |                   |               |                         |               |                           |               |

## 1.7 General SIP Approach- Regulatory Requirements and Guidance

In November 1990, the U.S. Congress enacted a series of amendments to the CAA. One of the primary effects of the revision was to expand and clarify the planning provisions for those areas not meeting the NAAQS. The CAA, as amended, authorizes comprehensive federal and state programs to provide for attainment and maintenance of the NAAQS. Section 1.7.1 outlines CAA requirements for Pb nonattainment areas. In addition, EPA has published guidance documents to clarify environmental regulations relating to attainment of the NAAQS and to assist in developing approaches for implementing those regulations. Section 1.7.2 summarizes applicable EPA guidance.

### 1.7.1 Clean Air Act and Code of Federal Regulations

Plan provisions for Pb nonattainment areas are contained in CAA Title I, Part A and Title I Part D, Subparts 1 and 5. A summary of requirements applicable to this SIP revision is provided in Table 1-8 below.

Table 1-8 Clean Air Act Regulatory Requirements for Pb NAA SIPs

| CAA Citation                                                                                                                                          | Action to Meet Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Location in SIP    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>CAA Title I – Air Pollution Prevention and Control;<br/>Part A – Air Quality and Emissions Limitations;<br/>Section 110 – Implementation Plans</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |
| <b>110(a)(1) and (2)</b>                                                                                                                              | <p>Clean Air Act (CAA) Section 110(a)(1) requires states to submit State Implementation Plans (SIPs) within three years following the promulgation of new or revised National Ambient Air Quality Standard (NAAQS) to provide for implementation, maintenance, and enforcement of such standards. Each of these SIPs must address certain basic elements, or the "infrastructure", of its air quality management programs under CAA Section 110(a)(2). These elements, detailed in CAA Sections 110(a)(2)(A) through (M), include provisions for monitoring, emissions inventories, and modeling designed to assure attainment and maintenance of the NAAQS.</p> <p><i>The Arizona State Implementation Plan Revision under Clean Air Act Section 110(a)(1) and (2): Implementation of the 2008 Lead National Ambient Air Quality Standard was submitted to EPA on October 14, 2011.</i></p> | <b>Section 1.5</b> |
| <b>110(l)</b>                                                                                                                                         | <p>"Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act."</p> <p>This SIP includes a discussion of anti-backsliding provisions to ensure noninterference with applicable requirements of the CAA.</p>                                                                                                                                                                                                                                                                                                                         | <b>Chapter 6</b>   |

| CAA Citation                                                                                                                                                                                                                                                                | Action to Meet Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Location in SIP  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>CAA Title I – Air Pollution Prevention and Control; Part D – Plan Requirements for Nonattainment Areas;<br/> Subpart 1 – Nonattainment Areas in General; Section 172. Nonattainment Plan Provisions in General;<br/> Subsection 172(c) Nonattainment Plan Provisions</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |
| <b>172(c)(1) – In General</b>                                                                                                                                                                                                                                               | <p>“Such plan provisions shall provide for the implementation of all reasonably available control measures [RACM] as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [RACT]) and shall provide for attainment of the national primary ambient air quality standards.”</p> <p>RACT is defined for Pb as that technology which is necessary to achieve the NAAQS (40 CFR 51.100(o)). Chapter 4 contains an explanation of applicable RACM/RACT for point and area sources in the nonattainment area.</p>                            | <b>Chapter 4</b> |
| <b>172(c)(2) – RFP (Reasonable Further Progress)</b>                                                                                                                                                                                                                        | <p>“Such plan provisions shall require reasonable further progress” defined in CAA Sec. 171(1) as “... annual incremental reductions in emissions ... for the purpose of ensuring attainment of the applicable national ambient air quality standards by the applicable date.”</p> <p>This submittal demonstrates, in accordance with 73 FR 66964 (November 12, 2008), that the Hayden NAA will attain and maintain the Pb NAAQS with implemented control measures that adhere to an ambitious compliance schedule, which is expected to periodically yield significant emissions reductions. As such, the RFP requirement is met.</p>                                                     | <b>Chapter 4</b> |
| <b>172(c)(3) – Inventory [Emissions]</b>                                                                                                                                                                                                                                    | <p>“Such plan provisions shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements of this part are met.”</p> <p>ADEQ developed a 2017 base year inventory from the 2017 National Emissions Inventory (NEI) and ADEQ Internal Point Source Database. A 2026 attainment year inventory, projected from the base year, includes emissions reductions from implementation of existing and new control measures. Base year and projected emissions are summarized in Chapter 3.</p> | <b>Chapter 3</b> |

| CAA Citation                                                             | Action to Meet Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Location in SIP                       |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>172(c)(4) – Identification and Quantification</b>                     | <p>“Such plan provisions shall expressly identify and quantify the emissions, if any, of any such pollutant or pollutants which will be allowed, in accordance with Section 173(a)(1)(B), from the construction and operation of major new or modified stationary sources in each such area. The plan shall demonstrate to the satisfaction of the Administrator that the emissions quantified for this purpose will be consistent with the achievement of reasonable further progress and will not interfere with attainment of the applicable national ambient air quality standard by the applicable attainment date.”</p> <p>The permit program requirements of CAA section 173(a)(1)(B) are applicable to sources located in a “targeted economic development zone” as determined by the Administrator under consultation with the Secretary of Housing and Urban Development. No such zones are currently known to exist within the Hayden Pb NAA.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>No additional location in SIP.</b> |
| <b>172(c)(5) – Permits for New and Modified Major Stationary Sources</b> | <p>“Such plan provisions shall require permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area, in accordance with section 173.”</p> <p>Nonattainment new source review (NNSR) programs should ensure that construction and modification of major stationary sources will not interfere with RFP or attainment of the 2008 Pb NAAQS. The NNSR requirements apply to sources that have the potential to emit in amounts greater than the applicable major source threshold for a particular pollutant (40 CFR 51.165(a)(1)(iv)). For new sources located in areas that are designated nonattainment for the 2008 Pb NAAQS, 100 tons per year (tpy) or more of Pb represents a major source. Similarly, Pb NNSR requirements also apply to any existing major stationary source of Pb that proposes a major modification, i.e., a physical change or change in the method of operation that results in a significant net emissions increase (0.6 tpy or more) of Pb (40 CFR 51.165 (a)(1)(x)(A)).</p> <p>All new sources and modifications to existing sources in Arizona are subject to state requirements for preconstruction review and permitting pursuant to Arizona Administrative Code (A.A.C.) Title 18, Chapter 2, Articles 2, 3, and 4 or relevant county rules. All new major sources and major modifications to existing major sources in Arizona are also subject to the nonattainment new source review (NNSR) provisions of these rules or prevention of significant deterioration for attainment areas.</p> <p>On November 2, 2015 EPA Region 9 Administrator published a notice of final rulemaking issuing limited approval/limited disapproval (LA/LD) of an October 29, 2012 Arizona SIP revision designed to</p> | <b>No additional location in SIP.</b> |

| CAA Citation                                         | Action to Meet Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Location in SIP    |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                                                      | <p>update the new source review (NSR) rules included in the SIP and to bring the state's NSR program into compliance with federal requirements.</p> <p>On April 28, 2017 ADEQ submitted a SIP revision with rule amendments intended to address deficiencies related to major NSR with the exception of requirements pertaining to greenhouse gases (GHGs). ADEQ is currently administering the NSR requirements for GHGs under a delegation agreement with EPA. On May 4, 2018 EPA took final action to approve Arizona's major NSR regulatory revisions. The action included a conditional approval of ADEQ's NSR program with respect to CAA requirements related to ammonia as a precursor to fine particulate matter (PM<sub>2.5</sub>) under the NNSR program requirements in CAA section 189(e).<sup>31</sup></p> <p>On January 14, 2020 ADEQ submitted a SIP revision addressing the regulation of ammonia as a precursor of PM<sub>2.5</sub> in the major NSR program, as well as additional issues related to NSR. On July 22, 2020 ADEQ submitted a SIP revision to address the outstanding deficiencies in ADEQ's program relating to minor NSR. EPA approved these revisions in a June 2021 rulemaking.<sup>32</sup></p> <p>At this time, ADEQ's NNSR program is fully approved with respect to Pb.</p> |                    |
| <b>172(c)(6) – Other Measures</b>                    | <p>“Such plan provisions shall include enforceable emissions limitations, and such other control measures, means or techniques ..., as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for attainment of such standard in such area by the applicable attainment date specified in this part.”</p> <p>Emissions limitations, control measures, and applicable compliance schedules for Pb sources in the nonattainment area may be found in Chapter 4.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Chapter 4</b>   |
| <b>172(c)(7) – Compliance with Section 110(a)(2)</b> | <p>“Such plan provisions shall also meet the applicable provisions of Section 110(a)(2).”</p> <p>As noted above, the <i>Arizona State Implementation Plan Revision under Clean Air Act Section 110(a)(1) and (2): Implementation of the 2008 Lead National Ambient Air Quality Standard</i> was submitted to EPA on October 14, 2011.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Section 1.5</b> |

<sup>31</sup> See 83 FR 19631 (May 4, 2018) and 40 CFR 52.144(C).

<sup>32</sup> See 86 FR 31927 (June 16, 2021).

| CAA Citation                                                                                                                                                                                                      | Action to Meet Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Location in SIP                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <b>172(c)(8) – Equivalent Techniques</b>                                                                                                                                                                          | <p>“Upon application by any State, the Administrator may allow the use of equivalent modeling, emission inventory, and planning procedures, unless the Administrator determines that the proposed techniques are, in the aggregate, less effective than the methods specified by the Administrator.”</p> <p>ADEQ’s intended modeling (Modeling Protocol) and emissions inventory (Inventory Preparation Plan) methodologies were submitted to and reviewed by EPA. Dispersion modeling to establish emissions limits for the ASARCO copper smelter was conducted using AERMOD and LEADPOST with EPA’s concurrence and in accordance with the “Guideline on Air Quality Models.”</p>                                                                                                                                                                                                                                                   | <b>Chapters 3 &amp; 5; Appendices A &amp; B</b> |
| <b>172(c)(9) – Contingency Measures</b>                                                                                                                                                                           | <p>“Such plan shall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or the Administrator.”</p> <p>Consistent with 73 FR 67040 (Nov. 12, 2008), this submittal includes emissions limits, compliance schedules, and permit program and enforcement information that demonstrate the area will attain and maintain the Pb NAAQS with control measures fully implemented. It also contains a contingency measure to be implemented if the area fails to achieve RFP or fails to attain the NAAQS by the attainment year of 2027. As such, the contingency measure requirement is met.</p> | <b>Chapter 4</b>                                |
| <b>CAA Title I – Air Pollution Prevention and Control; Part D – Plan Requirements for Nonattainment Areas; Subpart 1 – Nonattainment Areas in General; Section 176. Limitations on Certain Federal Assistance</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                 |
| <b>176(c) – Transportation Conformity</b>                                                                                                                                                                         | <p>Transportation conformity is required to ensure that federal funding and approval are given to highway and transit projects that are consistent with ("conform to") the air quality goals established by a state air quality implementation plan (SIP). Conformity, to the purpose of the SIP, means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards.</p> <p>40 CFR 93.102(b) waives transportation conformity for Pb nonattainment and maintenance areas.</p>                                                                                                                                                                                                                                                                                                                                      | <b>No additional location in SIP.</b>           |

| CAA Citation                                                                                                                                                                                                                                                                                               | Action to Meet Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Location in SIP                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>176(c) – General Conformity</b>                                                                                                                                                                                                                                                                         | <p>Similar to Transportation Conformity, which applies to highways and mass transit projects, the General Conformity Rule, which applies to all other federal actions, ensures that the actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state’s plans to meet national standards for air quality.</p> <p>General conformity for the Hayden Pb nonattainment area, located within both Gila and Pinal Counties, must be addressed to assure Pb emissions from any federal actions or plans do not exceed the rates outlined in 40 CFR 93.153(b) (see 58 FR 63253, November 30, 1993). Criteria for making determinations and provisions for general conformity are located in A.A.C. R18-2-1438. ADEQ commits to review and comment, as appropriate, on any federal agency draft general conformity determination it receives pursuant to 40 CFR 93.155 for activities scheduled in this air quality planning area. There are currently no known federal plans or actions affecting air quality currently in the Hayden area.</p>                          | <b>No additional location in SIP.</b> |
| <b>CAA Title I – Air Pollution Prevention and Control; Part D – Plan Requirements for Nonattainment Areas; Subpart 5 – Additional Provisions for Areas Designated Nonattainment for Sulfur Oxides, Nitrogen Dioxide, or Lead; Section 191. Plan Submission Deadlines and Section 192. Attainment Dates</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |
| <b>191(a) – Submission</b>                                                                                                                                                                                                                                                                                 | <p>“Any State containing an area designated or re-designated under section 107(d) as nonattainment with respect to the national primary ambient air quality standards for sulfur oxides, nitrogen dioxide, or Pb subsequent to the date of the enactment of the Clean Air Act Amendments of 1990 shall submit to the Administrator, within 18 months of the designation, an applicable implementation plan meeting the requirements of this part.”</p> <p>Designation of the Hayden area as nonattainment was effective October 3, 2014 (79 FR 52205, September 3, 2014). The nonattainment area plan was due to EPA by April 2016. ADEQ submitted SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 Final on March 3, 2017.</p> <p>EPA published a finding of failure to attain the 2008 Pb standards on January 31, 2022 (87 FR 4805). As a result of the determination, the State of Arizona is required to submit a revision to the Arizona SIP by January 31, 2023, to provide for expeditious attainment of the Pb NAAQS in the Hayden Pb NAA by January 31, 2027. See this submittal.</p> | <b>Section 1.5</b>                    |

| CAA Citation                               | Action to Meet Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Location in SIP    |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>192(a) – Plans Under Section 191(a)</b> | <p>“Implementation plans required under section 191(a) shall provide for attainment of the relevant primary standard as expeditiously as practicable, but no later than 5 years from the date of the nonattainment designation.”</p> <p>Designation of the Hayden area was effective October 3, 2014 (79 FR 52205; September 3, 2014). On March 3, 2017, ADEQ submitted SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 Final to demonstrate attainment of the 2008 Lead NAAQS in the Hayden planning area by the statutory attainment date of October 3, 2019.</p> <p>EPA published a finding of failure to attain the 2008 Pb standards on January 31, 2022 (87 FR 4805). As a result of the determination, the State of Arizona is required to submit a revision to the Arizona SIP by January 31, 2023, to provide for expeditious attainment of the Pb NAAQS in the Hayden NAA by January 31, 2027. See this submittal.</p> | <b>Section 1.5</b> |

## 1.7.2 EPA Guidance

Applicable guidance for demonstrating attainment of the 2008 Pb NAAQS includes the following EPA memoranda:

- The July 8, 2011, Memorandum, *2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers*,<sup>33</sup> and the July 11, 2011, *Addendum to the 2008 Lead NAAQS Implementation*, Scott L. Mathias, Interim Director, U.S. Environmental Protection Agency, Air Quality Policy Division, offers guidance on attainment demonstrations, modeling, reasonable further progress (RFP) and contingency measures for developing SIP revisions for the 2008 Lead NAAQS. The addendum provides guidance on producing emissions inventories for the 2008 NAAQS specifically.<sup>34</sup>
- The March 2012 Memorandum, *Implementation of the 2008 Lead National Ambient Air Quality Standards, Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions*, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, provides guidance on developing RACM for sources in Pb nonattainment areas, including reasonably available control technologies (RACT) for major point sources. It also provides some guidance on RACM for re-entrained Pb found in fugitive dust.<sup>35</sup>
- The September 1992 Memorandum, *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, provides guidance for developing RACM and best available control measures for fugitive dust from point sources.<sup>36</sup>
- The November 2011 Memorandum, *Guidelines for Preparing Letters Submitting State Implementation Plans (SIPs) to EPA and for Preparing Public Notices for SIPs*, from Janet McCabe and Becky Weber to Air Division Directors, Regions 1-10, U.S. EPA, provides guidelines for SIP revision submittal<sup>37</sup>.

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<sup>33</sup> See U.S. EPA. (2011, July 8). *2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Guidance Documents*. Retrieved from US EPA, Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Guidance Documents, <https://www.epa.gov/lead-air-pollution/lead-pb-national-ambient-air-quality-standards-naaqs-implementation-guidance>, July 10, 2023.

<sup>34</sup> See U.S. EPA. (2012, August 10). *Addendum to the 2008 Lead NAAQS Implementation Questions and Answers Signed on July 11, 2011*. Retrieved from US EPA, Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Guidance Documents, <https://www.epa.gov/lead-air-pollution/lead-pb-national-ambient-air-quality-standards-naaqs-implementation-guidance>, July 11, 2023.

<sup>35</sup> See U.S. EPA. (2012, March). *Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions*. Retrieved from Retrieved from US EPA, Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Guidance Documents, <https://www.epa.gov/lead-air-pollution/lead-pb-national-ambient-air-quality-standards-naaqs-implementation-guidance>, July 11, 2023.

<sup>36</sup> See U.S. EPA. (1992, September). *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*. Retrieved from National Service Center for Environmental Publications (NSCEP), <https://tinyurl.com/27kchzk4>. July 11, 2023.

<sup>37</sup> See U.S. EPA. (2011, November 22). *Guidelines for Preparing Letters Submitting State Implementation Plans (SIPs) to EPA and for Preparing Public Notices for SIPs*. Retrieved from US EPA Guidance on Streamlining the SIP Process, <https://www.epa.gov/air-quality-implementation-plans/guidance-streamlining-sip-process>, July 11, 2023.

## 2 AIR QUALITY MONITORING

This chapter provides historical ambient air monitoring network information in order to provide context for the nonattainment area network, NAAQS exceedances, and air monitor placement in the Hayden planning area.

Ambient monitoring networks for air quality are established to sample pollutants in a variety of representative settings, to assess health and welfare impacts, and to assist in determining air pollution sources. These networks contain individual monitoring sites that are operated by a number of government agencies and regulated facilities.

The EPA protocols for Pb monitoring are located in the following sections of the Code of Federal Regulations (CFR):

- 40 CFR Part 50, Appendix G, Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air
- 40 CFR Part 50, Appendix Q, Reference Method for the Determination of Lead in Particulate Matter as PM<sub>10</sub> Collected from Ambient Air
- 40 CFR Part 53 Subpart C, Ambient Air Monitoring Reference and Equivalent Methods
- 40 CFR Part 58 and Appendices A, C, D, and E, Ambient Air Quality Surveillance

In order for data to be used for determining NAAQS compliance (i.e. for boundary designations), it must meet the above requirements. Specifically, data must be measured using instruments designated by EPA as Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM); it must be reported to the Air Quality System (AQS)<sup>38</sup> and must follow an EPA approved quality assurance plan.

### 2.1 Hayden Pb and Meteorological Monitoring Network

Air monitoring is generally performed by state, local, and tribal agencies at federally required locations or other locations with suspected high pollutant concentrations. EPA and state, local, and tribal agencies may also monitor in areas where the public has complaints or concerns. Agencies planning to use air pollutant measurements for regulatory purposes operate with EPA reference or equivalent methods and develop and follow approved quality assurance procedures.<sup>39</sup> In October 2010, ADEQ established an air quality monitor at the Globe Highway monitoring site within the Hayden NAA. ADEQ installed an additional air quality monitor at the Hillcrest monitoring site in January 2016. These two monitors are currently the only State and Local Air Monitor System (SLAMS) monitors in the NAA with AQS-certified data that can be used to determine NAAQS compliance.

ADEQ operates meteorological equipment at selected sites throughout its network. Some sites were originally established because other meteorology networks (NWS, AZMet, etc.) were not located near ADEQ's ambient air quality monitoring sites. As recommended in ADEQ's Five-Year Network Assessment, ADEQ has begun to expand the meteorology monitoring network and standardize the meteorological

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<sup>38</sup> EPA's repository of air quality data.

<sup>39</sup> See U.S. EPA, Managing Air Quality, Ambient Air Monitoring. Retrieved November 7, 2023 from <https://www.epa.gov/air-quality-management-process/managing-air-quality-ambient-air-monitoring>

measurements so that all sites collect measurements of wind speed, wind direction, temperature, and relative humidity. ADEQ only reports meteorology data to AQS as required by 40 CFR 58.16.

Three meteorological monitors are found within the area of study; two are maintained by ADEQ and the other by ASARCO. The two MET monitors maintained by ADEQ are located at the Hayden Old Jail and Globe Highway monitoring sites. The Hayden Old Jail monitor is located approximately 0.66 miles west of the ASARCO concentrator and smelter complexes, and the Globe Highway monitor is located approximately 0.59 miles to the east of the ASARCO Smelter. The ASARCO monitor is located at the Camera Hill site, about 0.22 miles south of the smelter.

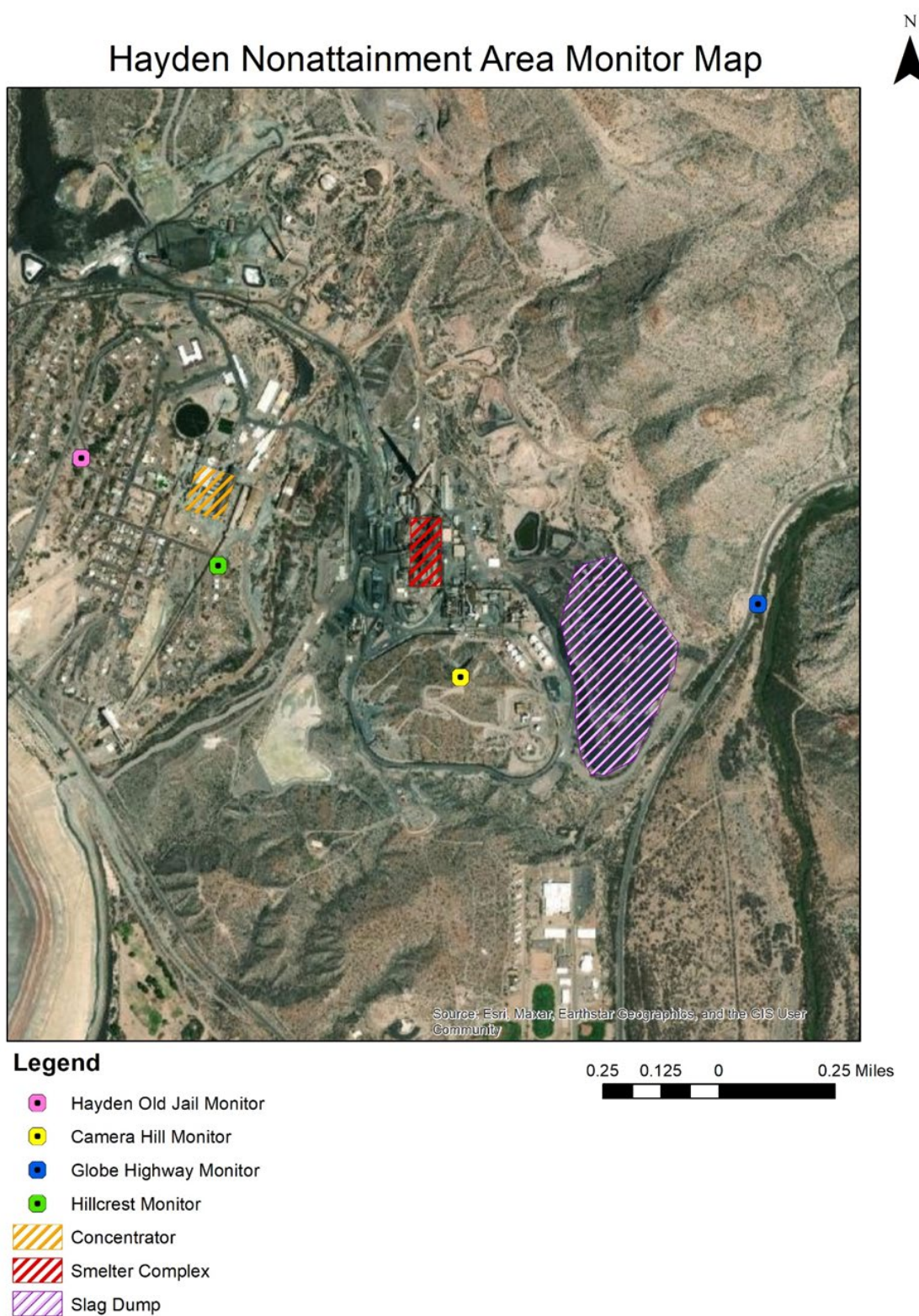
Table 2-1 summarizes the locations of the MET and Pb monitoring stations used in ADEQ's meteorology and ambient air analysis.

**Table 2-1 Hayden MET and Ambient Pb Monitoring Stations**

| Hayden Monitoring Stations |                             |          |            |                  |
|----------------------------|-----------------------------|----------|------------|------------------|
| Site Name                  | Distance to Smelter (miles) | Latitude | Longitude  | Elevation (feet) |
| ADEQ MET Monitors          |                             |          |            |                  |
| Globe Highway              | 0.59                        | 33.00251 | -110.76545 | 1,962            |
| Hayden Old Jail            | 0.66                        | 33.00621 | -110.78645 | 2,043            |
| ASARCO MET Monitors        |                             |          |            |                  |
| Camera Hill                | 0.22                        | 33.00046 | -110.775   | 2,292            |
| ADEQ Pb Monitors           |                             |          |            |                  |
| Globe Highway              | 0.59                        | 33.00251 | -110.76545 | 1,962            |
| Hillcrest                  | 0.39                        | 33.00363 | -110.78232 | 2,111            |

Figure 2-1 below shows a map of the ambient Pb and meteorological monitoring networks.

Figure 2-1 Hayden Nonattainment Area Monitor Map



### 2.1.1 Monitoring Equipment and Quality Assurance Procedures

ADEQ's two TSP-Pb monitors (one operating as the primary monitor, the other as a quality assurance, collocated monitor) at Globe Highway are required per 40 CFR part 58 Appendices A and D. Based on a recommendation by EPA, ADEQ installed an additional air quality monitor at the Hillcrest monitoring site in January 2016. ADEQ's current data quality assurance program plan (QAPP) was approved by EPA Region 9 in January 2018. ADEQ sustains a quality assurance system as required by EPA to ensure high quality data is collected. The EPA primarily specifies the quality assurance (QA) requirements for operating air monitors in 40 CFR Part 58 Appendix A, *The Quality Assurance Handbook for Air Pollution Measurement Systems: Volume II: Ambient Air Quality*, and other supporting guidance documents.

ADEQ develops quality assurance plans for air monitoring networks, which provide detailed information regarding the specifics of each air monitoring network and how data will be managed. Components of ADEQ's quality system include, but are not limited to: ADEQ being established as the primary quality assurance organization (PQAO) for the criteria and non-criteria pollutant air monitoring data collected and reported to EPA's Air Quality System (AQS); an agency-level Quality Management Plan (QMP), which is an "umbrella" document that defines, in broad terms, the strategies used to carry out quality assurance and quality control (QA/QC) in environmental data collection activities; and Division-level QAPPs for each major, ongoing air monitoring network.<sup>40</sup>

## 2.2 Ambient Lead Data Trends

A violation of the 2008 Pb primary NAAQS occurs when the three-month rolling average ambient Pb concentration exceeds  $0.15 \mu\text{g}/\text{m}^3$ , evaluated over a three-year period. Recent trends show ADEQ's Globe Highway monitor recorded three exceedances of the 2008 Pb NAAQS in 2017, one in 2018, three in 2019, and no exceedances in 2020, 2021, and 2022. Table 2-2 shows the rolling 3-month average Pb concentrations at the Globe Highway monitor from 2011 through 2022.<sup>41</sup>

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<sup>40</sup> ADEQ, State of Arizona Air Monitoring Network Plan for the Year 2022, June 2022.

<sup>41</sup> Existing air quality data is summarized pursuant to 40 CFR 51.115.

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Table 2-2 Ambient Pb Concentrations - Globe Highway Monitor

| ADEQ Globe Highway Monitor Rolling 3-month Average Pb concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>42</sup> |       |       |       |       |       |      |      |      |       |      |      |       |
|----------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|------|------|------|-------|------|------|-------|
|                                                                                                                | Jan.  | Feb.  | March | April | May   | June | July | Aug. | Sept. | Oct. | Nov. | Dec.  |
| <b>2011</b>                                                                                                    | --    | --    | 0.11  | 0.18  | 0.21  | 0.27 | 0.23 | 0.14 | 0.07  | 0.08 | 0.08 | 0.09  |
| <b>2012</b>                                                                                                    | 0.07  | 0.14  | 0.15  | 0.20  | 0.16  | 0.20 | 0.15 | 0.14 | 0.12  | 0.11 | 0.09 | 0.06  |
| <b>2013</b>                                                                                                    | 0.04  | 0.05  | 0.10  | 0.11  | 0.11  | 0.12 | 0.11 | 0.11 | 0.06  | 0.06 | 0.04 | 0.03  |
| <b>2014</b>                                                                                                    | 0.02  | 0.04  | 0.07  | 0.11  | 0.15  | 0.17 | 0.16 | 0.12 | 0.09  | 0.07 | 0.05 | 0.07  |
| <b>2015</b>                                                                                                    | 0.06  | 0.08  | 0.07  | 0.08  | 0.07  | 0.11 | 0.11 | 0.12 | 0.07  | 0.07 | 0.06 | 0.06  |
| <b>2016</b>                                                                                                    | 0.06  | 0.04  | 0.07  | 0.08  | 0.14  | 0.12 | 0.12 | 0.08 | 0.08  | 0.06 | 0.04 | 0.03  |
| <b>2017</b>                                                                                                    | 0.04  | 0.06  | 0.09  | 0.12  | 0.17  | 0.21 | 0.17 | 0.11 | 0.09  | 0.10 | 0.11 | 0.09  |
| <b>2018</b>                                                                                                    | 0.09  | 0.09  | 0.13  | 0.14  | 0.153 | 0.14 | 0.14 | 0.13 | 0.10  | 0.08 | 0.04 | 0.02  |
| <b>2019</b>                                                                                                    | 0.03  | 0.03  | 0.05  | 0.06  | 0.10  | 0.12 | 0.16 | 0.16 | 0.16  | 0.10 | 0.06 | 0.01  |
| <b>2020</b>                                                                                                    | 0.00* | 0.00* | 0.00  | 0.01  | 0.01  | 0.01 | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  |
| <b>2021</b>                                                                                                    | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00* |
| <b>2022</b>                                                                                                    | 0.00* | 0.00  | 0.00  | 0.00  | 0.01  | 0.01 | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  |

\*Indicates invalid 3-month Rolling Average due to data completeness issues.

Table 2-3 below shows the rolling three-month average Pb concentration from the Hillcrest monitor, which began operating January 2016. The addition of this monitor substantially increases the representativeness of Pb monitoring data available to ADEQ for regulatory purposes. ADEQ's Hillcrest monitor recorded two exceedances of the 2008 Pb primary NAAQS in 2016, six in 2017, three in 2018, and no exceedances in 2019, 2020, 2021, 2022.

Table 2-3 Ambient Pb Concentrations - Hillcrest Monitor

| ADEQ Hillcrest Monitor Rolling 3-month Average Pb concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>43</sup> |       |       |       |       |      |      |      |      |       |      |      |      |
|------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|------|------|------|------|-------|------|------|------|
|                                                                                                            | Jan.  | Feb.  | March | April | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| <b>2016</b>                                                                                                | N/A   | N/A   | 0.22  | 0.16  | 0.07 | 0.09 | 0.10 | 0.08 | 0.09  | 0.12 | 0.14 | 0.14 |
| <b>2017</b>                                                                                                | 0.11  | 0.19  | 0.20  | 0.19  | 0.09 | 0.07 | 0.07 | 0.11 | 0.13  | 0.28 | 0.26 | 0.28 |
| <b>2018</b>                                                                                                | 0.20  | 0.23  | 0.21  | 0.12  | 0.07 | 0.06 | 0.09 | 0.10 | 0.10  | 0.12 | 0.12 | 0.13 |
| <b>2019</b>                                                                                                | 0.09* | 0.09* | 0.09* | 0.09  | 0.09 | 0.07 | 0.07 | 0.07 | 0.09  | 0.10 | 0.08 | 0.04 |
| <b>2020</b>                                                                                                | 0.010 | 0.03  | 0.03  | 0.03  | 0.01 | 0.01 | 0.01 | 0.01 | 0.01  | 0.01 | 0.02 | 0.02 |
| <b>2021</b>                                                                                                | 0.01  | 0.01  | 0.01  | 0.01  | 0.01 | 0.01 | 0.01 | 0.01 | 0.01  | 0.01 | 0.01 | 0.01 |
| <b>2022</b>                                                                                                | 0.01  | 0.01  | 0.01  | 0.01  | 0.01 | 0.01 | 0.01 | 0.01 | 0.01  | 0.01 | 0.02 | 0.01 |

\*Indicates invalid 3-month Rolling Average due to data completeness issues.

Please note, 2017 was the last year of normal operations at the ASARCO Hayden Smelter (largest Pb source in the NA). During the years of 2018-2021 there were several shutdowns at the Smelter, resulting in decreased or complete shutdown of production.

<sup>42</sup> Highlighted values indicate a violation of the Pb NAAQS (over 0  $\text{g}/\text{m}^3$ ).

<sup>43</sup> Highlighted values indicate a violation of the Pb NAAQS (over 0  $\text{g}/\text{m}^3$ ). Months January and February for the Hillcrest monitor are "N/A" due to the fact that a complete rolling three-month average for 2016 is not available until March, as the monitor was not installed and operating until January 2016.

Figure 2-3 is a chart of three-month rolling averages monitored at the ADEQ Globe Highway monitor from 2011, when data collection began, through the end of 2022. Figure 2-4 illustrates values for the Hillcrest monitoring site.

Figure 2-2 Globe Highway Monitor Rolling 3-Month Average Concentrations

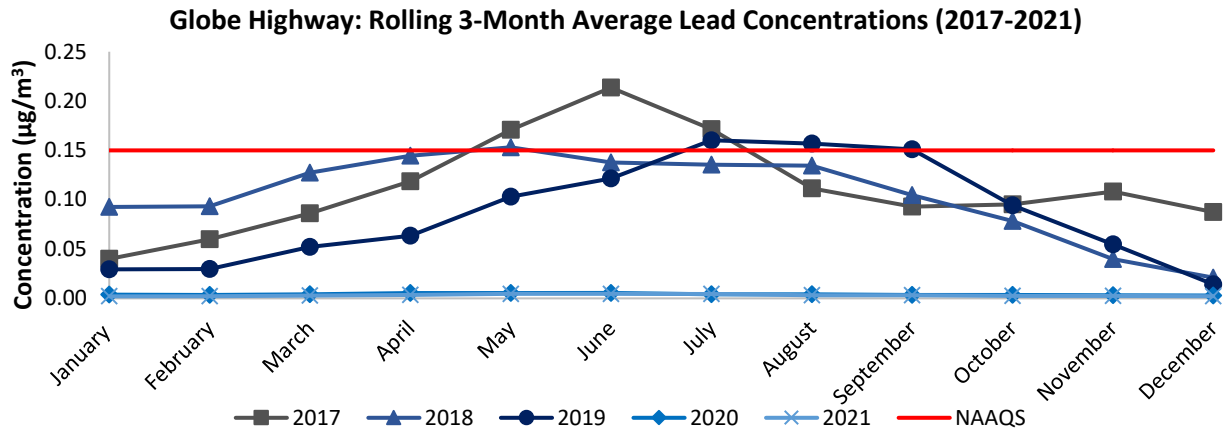
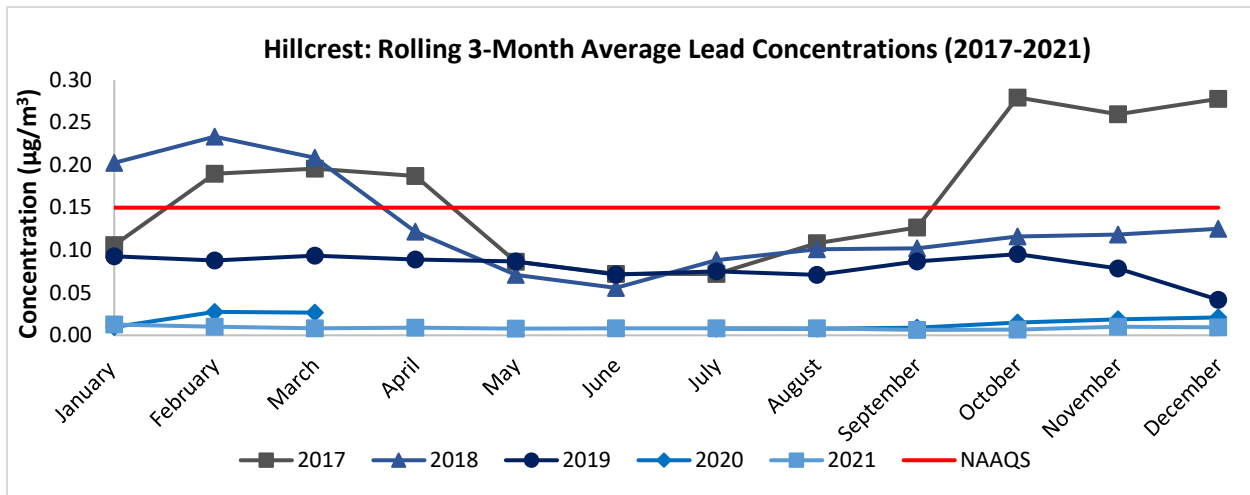


Figure 2-3 Hillcrest Monitor Rolling 3-Month Average Concentrations



NAAQS exceedances at all monitors were analyzed in conjunction with meteorological data in order to evaluate potential emissions sources and weather conditions that resulted in high ambient air concentrations of Pb. An in-depth meteorological analysis can be found in the Emissions Inventory TSD in Appendix A. Emissions sources are discussed in greater detail in Chapter 3.

## 2.3 Current Lead NAAQS Compliance

Tables 2-4 and 2-5 summarize the maximum three-month rolling average Pb concentrations (and design values) for the periods 2019-2021 and 2020-2022.<sup>44</sup>

**Table 2-4 2019-2021 Pb NAAQS Compliance Summary**

| 2019 through 2021 Pb-TSP Compliance                                                  |                               |      |      |                                      |
|--------------------------------------------------------------------------------------|-------------------------------|------|------|--------------------------------------|
| Bold denotes value above the standard.<br>(NAAQS 3-Month Rolling Average 0.15 µg/m³) |                               |      |      |                                      |
| Site Name                                                                            | 3-month Maximum Value (µg/m3) |      |      | Valid 2019-2021 Design Value (µg/m3) |
|                                                                                      | 2019                          | 2020 | 2021 |                                      |
| Gila County                                                                          |                               |      |      |                                      |
| Globe Highway                                                                        | 0.16                          | 0.01 | 0.00 | 0.16                                 |
| Hillcrest                                                                            | 0.10                          | 0.03 | 0.01 | —                                    |
| Number of Sites in Violation of the NAAQS                                            |                               |      |      | 1                                    |

Source: *Lead Design Values, 2021 (xlsx)*, EPA, May 25, 2022 (<https://www.epa.gov/air-trends/air-quality-design-values>).

**Table 2-5 2020-2022 Pb NAAQS Compliance Summary**

| 2020 through 2022 Pb-TSP Compliance                                                  |                               |      |      |                                      |
|--------------------------------------------------------------------------------------|-------------------------------|------|------|--------------------------------------|
| Bold denotes value above the standard.<br>(NAAQS 3-Month Rolling Average 0.15 µg/m³) |                               |      |      |                                      |
| Site Name                                                                            | 3-month Maximum Value (µg/m3) |      |      | Valid 2020-2022 Design Value (µg/m3) |
|                                                                                      | 2020                          | 2021 | 2022 |                                      |
| Gila County                                                                          |                               |      |      |                                      |
| Globe Highway                                                                        | 0.01                          | 0.00 | 0.01 | –                                    |
| Hillcrest                                                                            | 0.03                          | 0.01 | 0.01 | 0.03                                 |
| Number of Sites in Violation of the NAAQS                                            |                               |      |      | 0                                    |

<sup>44</sup> See 40 CFR Appendix R to Part 50 available at <https://www.govinfo.gov/app/details/CFR-2016-title40-vol2/CFR-2016-title40-vol2-part50-appR>.

### 3 EMISSIONS INVENTORIES

Section 172(c)(3) of the CAA requires that nonattainment area plans include an emissions inventory from all significant sources within a planning area:

“Such plan provisions shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements of this part are met.”

An emissions inventory helps identify the significant sources and source categories across the NAA. These inventories are intended to identify significant sources of emissions to help inform the development of pollution control measures that will bring the area into attainment.

As noted in Section 1.5, designation of the Hayden area as nonattainment for the Pb NAAQS in 2014 triggered CAA requirements under Title I, Section 110 and Part D for the State to submit a SIP revision to demonstrate how the area will attain the 2008 Pb NAAQS. The CAA provides that nonattainment areas must attain the Pb NAAQS as expeditiously as practicable, but no later than five years after the effective date of designation. On March 3, 2017, ADEQ submitted *SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 Final* to demonstrate attainment of the 2008 Lead NAAQS in the Hayden planning area by the statutory attainment date of October 3, 2019. The 2017 nonattainment area plan included a 2012 base year inventory and projected emissions to 2019 that incorporated emissions reduction measures (adopted in the 2017 plan) intended to provide for attainment by the required attainment date.

On January 31, 2022, EPA published a finding of failure to attain the 2008 Pb standards by the October 3, 2019 deadline.<sup>45</sup> This action established a new attainment date and requires the submittal of a new SIP revision meeting the requirements of CAA Title I, Part D, Subparts 1 and 5. The new plan must include any new measures determined necessary to demonstrate attainment of the Pb NAAQS by January 31, 2027.

For this new 2023 SIP revision, ADEQ inventoried Pb emissions for the base year of 2017. ADEQ chose 2017 as the base year from which to inventory emissions in accordance with EPA guidance.<sup>46</sup> The following reasons further support the selection of 2017 to develop a base year inventory:

- 2017 had the highest monitored ambient concentrations in recent years.
- 2017 was the last year of normal operations at the ASARCO Hayden Smelter.
- 2017 also had the highest reported emissions from ASARCO in recent years.

A projected 2026 attainment inventory includes additional emissions reduction measures (see Chapter 4 for a description of proposed new measures) necessary to provide for attainment by the new January 2027 attainment date.

The following Sections provide a broad overview of inventory methodologies and Pb emissions in the Hayden NAA for the years 2017 and 2026. For more information, see the Emissions Inventory Technical Support Document (EI TSD) in Appendix A.

<sup>45</sup> See 87 FR 4805 (January 31, 2022).

<sup>46</sup> See U.S. EPA, Air Quality Policy Division, Memorandum, “2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers,” July 8, 2011.

### 3.1 Point Sources

In accordance with the 2008 Pb NAAQS implementation rule,<sup>47</sup> ADEQ developed an emissions inventory for all point sources in the NAA with a potential to emit 0.5 tons per year (tpy) or more of Pb. ADEQ found that the only point source in the NAA is the primary copper smelter owned and operated by ASARCO. The Hayden smelter emissions are the most significant in the nonattainment area, making up roughly 96.3% of total emissions in the inventory. ADEQ's inventory partitions emissions from this facility into three categories: smelter stack and smelting process-related fugitives,<sup>48</sup> non-smelting process related fugitives, and roads.

#### 3.1.1 Stack & Smelting Process-Related Fugitives

Base year emissions for stack and smelting process-related fugitive emissions were provided to ADEQ by ASARCO in a 2017 emissions report retrieved from the State and Local Emissions Inventory System (SLEIS).

ADEQ projected stack and smelter process-related fugitive emissions for 2026 based on ASARCO's maximum allowable Pb emissions, that is, their proposed permitted (and federally enforceable) Potential to Emit (PTE). It is important to note that the PTE limits used in the 2026 emissions inventory and modeling reflects the controls implemented as part of the Converter Retrofit Project (CRP) and Consent Decree, as well as new emissions reduction measures adopted in this SIP revision.

In 2017 the highest contributors of Pb emissions are the main stack emissions coming from the flash furnace and converter, followed by fugitive emissions escaping from the converters. In 2026, the highest contributors will be the main stack and flash furnace fugitives. The anode furnaces in comparison remain a minor contributor in both years. Table 3-1 below displays emissions for these sources for 2017 and 2026.

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<sup>47</sup> See 73 FR 66964 (November 12, 2008).

<sup>48</sup> Fugitive Pb emissions that originate from the flash furnace, converters, and anode furnaces are considered "smelting process-related" fugitive emissions, whereas emissions from dust-related sources outside the smelter (like roads or materials handling) are referred to as "non-smelting process related" fugitive emissions. Calculations and further methods are discussed in detail in the EI TSD in Appendix A.

**Table 3-1 Projected Smelter Stack & Fugitive Emissions**

| 2026 Projected Hayden Pb Nonattainment Point Source Emission Inventory (in tons) |                                                       |                |                                 |
|----------------------------------------------------------------------------------|-------------------------------------------------------|----------------|---------------------------------|
| Smelter Stack & Fugitive Emissions                                               |                                                       |                |                                 |
| Source                                                                           | Description                                           | 2017 Emissions | 2026 Facility Potential to Emit |
| Main Stack Emissions                                                             |                                                       |                |                                 |
| Dryer with Flash Furnace & Converter                                             | Emission Point: Annulus Main Stack-R&R                | 1.1509         | 2.99                            |
| Acid Plant                                                                       | Emission Point: Acid Plant Inner Main Stack           | 0.0223         |                                 |
| Anode Furnace Baghouse                                                           | Emission Point: Anode Baghouse Stack                  | 0.0923         |                                 |
| Fugitive and Other Process Emissions                                             |                                                       |                |                                 |
| Flash Smelting                                                                   | Emission Point: Flash Furnace Fugitives               | 0.8135         | 0.2095                          |
| Converter                                                                        | Emission Point: Converter Fugitives                   | 1.8471         | 0.0856                          |
| Anode Refining Furnace: Fugitive Emissions                                       | Emission Point: Furnace Fugitives                     | 0.0554         | 0                               |
| Brick Crusher Baghouse                                                           | Emission Point: Brick Crusher Baghouse                | 0              | 0.0923                          |
| Small Boilers & Heaters                                                          | Emission Point: Miscellaneous Small Boilers & Heaters | 0              | 0.0005                          |
| Smelter Stack & Fugitive Emissions Total                                         |                                                       | 3.9815         | 3.3779                          |

### 3.1.2 Roads

Due to the interaction between high temperature atmospheric lead emissions and coarse mode particles, ADEQ quantified leaded road dust emissions from the ASARCO concentrator and smelter complexes. This portion of the inventory was divided into unpaved and paved roads for both the concentrator and smelter. To quantify emissions from these scenarios, ADEQ used a percent Pb factor applied to particulate matter (PM) totals of 0.3150 percent for road dust. This factor was submitted by the source and was applied to PM totals in ASARCO's 2017 SLEIS submission. Tables 3-2 through 3-5 present 2017 base year and projected 2026 emissions for these sources.

**Table 3-2 Smelter Road Dust Emissions**

| <b>Point Source Inventory</b>                      |                                                                         |                          |
|----------------------------------------------------|-------------------------------------------------------------------------|--------------------------|
| <b>Smelter Paved Road Dust Emissions (in tons)</b> |                                                                         |                          |
| <b>Source</b>                                      | <b>Description</b>                                                      | <b>2017 Pb Emissions</b> |
| Concentrate, anode, blister receipts & shipments   | Emissions from hauling of concentrate, oxygen, anodes, & blister copper | 0.0002                   |
| General Plant Traffic                              | Emissions from the flow of general plant traffic                        | 0.0052                   |
| Water truck                                        | Emissions from maintenance of roads by water truck                      | 0.0084                   |
| Street Sweeper                                     | Emissions from maintenance of roads by street sweeper                   | 0.0026                   |

| Point Source Inventory                        |                                                                             |                   |
|-----------------------------------------------|-----------------------------------------------------------------------------|-------------------|
| Smelter Paved Road Dust Emissions (in tons)   |                                                                             |                   |
| Plant Service Haul Truck                      | Emissions from hauling material by plant service haul trucks                | 0.0050            |
| Scrap handling forklifts                      | Emissions from traffic of forklifts                                         | 0.0108            |
| Miscellaneous use forklifts                   | Emissions from traffic of forklifts                                         | 0.0015            |
| Misc. Delivery Trucks                         | Emissions delivering various items to tanks or heavy items to point of use. | 0.0003            |
| Sulfuric acid trucks                          | Emissions from hauling of sulfuric acid                                     | 0.0024            |
| Storage pile front-end loaders                | Emissions from traveling of front-end loaders                               | 0.0100            |
| Misc. use front-end loaders                   | Emissions from traveling of front-end loaders                               | 0.0083            |
| Smelter Paved Roads Emissions Total           |                                                                             | 0.0546            |
| Smelter Unpaved Road Dust Emissions (in tons) |                                                                             |                   |
| Source                                        | Description                                                                 | 2017 Pb Emissions |
| Flux Trucks                                   | Emissions from hauling flux from the crusher to the stockpiles              | 0.0037            |
| Slag Trucks                                   | Emissions from hauling slag from the slag dump to mill for recycling        | 0.0053            |
| Slag Trucks                                   | Emissions from hauling slag from the furnace to the slag dump               | 0.0047            |
| Smelter Unpaved Roads Emissions Total         |                                                                             | 0.0136            |

Table 3-3 Concentrator Road Dust Emissions

| Point Source Inventory Cont.                       |                                                    |                   |
|----------------------------------------------------|----------------------------------------------------|-------------------|
| Concentrator Paved Road Dust Emissions (in tons)   |                                                    |                   |
| Source                                             | Description                                        | 2017 Pb Emissions |
| General Plant Traffic (Includes 18 Wheelers)       | Emissions from travel to concentrator storage area | 0.0002            |
| Concentrator Paved Roads Emissions Total           |                                                    | 0.0002            |
| Concentrator Unpaved Road Dust Emissions (in tons) |                                                    |                   |
| Source                                             | Description                                        | 2017 Pb Emissions |
| General Plant Traffic (Includes 18 Wheelers)       | Emissions from travel to concentrator storage area | 0.0146            |
| Concentrator Unpaved Roads Emissions Total         |                                                    | 0.0146            |

Table 3-4 Road Dust Summary

| Point Source Inventory                |                   |
|---------------------------------------|-------------------|
| Road Dust Emissions Summary (in tons) |                   |
| Source                                | 2017 Pb Emissions |
| Paved Roads                           | 0.0548            |
| Unpaved Roads                         | 0.0282            |
| Road Emissions Total                  | 0.0830            |

**Table 3-5 Projected Facility Road Emissions**

| 2026 Projected Hayden Pb Nonattainment Point Source Emission Inventory |                |                                 |
|------------------------------------------------------------------------|----------------|---------------------------------|
| Facility Road Emissions (in tons)                                      |                |                                 |
| Source                                                                 | 2017 Emissions | 2026 Facility Potential to Emit |
| Paved Roads                                                            | 0.0548         | 0.1147                          |
| Unpaved Roads                                                          | 0.0282         | 0.0956                          |
| Facility Road Emissions Total                                          | 0.0830         | 0.2103                          |

### 3.1.3 Non-smelting Process-Related Fugitives

Non-smelting process related fugitive emissions at ASARCO's Hayden smelter result from processes that are separate from the building where copper is smelted. These sources include slag pouring, reverts crushing and handling, concentrate handling, and dewatering of the Venturi scrubber slurry. ADEQ used the following methods to derive emissions for years 2017 and 2021:

**Slag pouring** - Base year Pb emissions due to slag pouring were provided by the facility in their annual emissions submission. The calculation method used can be found in EPA AP-42, *Compilation of Air Pollutant Emission Factors*, Chapter 12.3 using tables 12.3-19. For attainment year emissions, ADEQ used ASARCO's permitted PTE emissions, which was also calculated using EPA AP-42, Chapter 12.3, tables 12.3-19.

#### **Reverts crushing and reverts storage and handling – ASARCO**

ADEQ has chosen to quantify reverts crushing and handling emissions because previous soil sampling around these operations have shown elevated soil lead concentrations. Therefore, reverts crushing and handling is a quantifiable source of fugitive emissions and windblown lead dust. Both the coarse revert crushing circuit and the fine crushing circuit are handled on-site by a contractor, SmithCo. To quantify emissions from these scenarios, ADEQ used a percent Pb factor applied to PM totals of 1.04 percent for reverts crushing. This factor was submitted by the contractor and was applied to PM totals in ASARCO's 2017 SLEIS submission.

At the smelter complex, reverts storage and handling operations take place in two areas: reverts crushing north and reverts crushing south. Three emissions scenarios were considered for each reverts handling area: wind erosion, batch drop emissions, and load out emissions. To quantify emissions from these scenarios, ADEQ used a percent Pb factor applied to PM totals of 0.7981 percent for reverts handling. This factor was submitted by the source and was applied to PM totals in ASARCO's 2017 SLEIS submission.

An additional revert storage pile was added in 2018, referred to as the "cold dope" pile. This pile has similar emissions characteristics to the north reverts pile and thus similar emission scenarios. Since emissions for the cold dope pile did not exist in 2017, 2018 emissions will be used since this was the highest emissions for this pile since it was created. Additionally, ADEQ used the percent Pb factor discussed above for reverts storage and handling operations.

#### **Concentrate storage and handling - ASARCO**

Like reverts crushing, the three emissions scenarios ADEQ quantified were: wind erosion, batch drop emissions, and load out emissions. These scenarios were applied to the concentrate bedding and overflow storage areas. ADEQ quantified these scenarios by applying a percent Pb factor, which was provided by the source, to PM totals reported in the sources 2017 SLEIS submission. The percent lead factor applied to the PM totals for the overflow storage areas was 0.1683 percent. The percent lead factor applied to the PM totals for the bedding area was 0.315 percent.

**Dewatering of Venturi scrubber slurry** – In the base year, slurry from the venturi scrubber was dewatered in open air wet/dry bins. However, as part of the fugitive dust plan, the acid plant scrubber blowdown material (venturi scrubber slurry) is to be handled by first diverting the slurry to a new thickener. From the thickener, the material will be sent to two electric dryers, and the dried cake will then be discharged directly into bags. Because the CERCLA investigation found high lead concentrations in the open air

wet/dry bins (see Section 3.4), ADEQ feels this operational change will greatly reduce the ambient air Pb concentrations.

For the sake of consistency, emissions from the wet/dry bins were quantified using the same methods the source used in their 2017 SLEIS report (for materials handling). This particular method can be found in AP-42, section 11.2.3 (May, 1983) Aggregate Handling and Storage Piles.

**Table 3-6 Projected Process Fugitive Emissions**

| <b>2026 Projected Hayden Pb Nonattainment Point Source Emission Inventory</b> |                                                                                          |                       |                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------|----------------------------------------|
| <b>Process Fugitive Emissions (in tons)</b>                                   |                                                                                          |                       |                                        |
| <b>Source</b>                                                                 | <b>Description</b>                                                                       | <b>2017 Emissions</b> | <b>2026 Facility Potential to Emit</b> |
| Pouring of Slag at the Slag Dump                                              | fugitive emissions released when molten slag is poured at the dump                       | 0.04043               | 0.05120                                |
| Pile-Unloading bedding area                                                   | Emissions resulting from wind erosion                                                    | 0.00014               | 0.00107                                |
| Unloading from truck/rail to bedding area                                     | Unloading copper concentrate and by-products from truck or rail to unloading dump hopper | 0.00002               | 0.00009                                |
| Load out from storage piles onto belt                                         | Emissions from load out of concentrate in outdoor storage                                | 0.00037               | 0.00150                                |
| Overflow concentrate storage                                                  | Emissions resulting from wind erosion                                                    | 0.00441               | 0.03911                                |
| Transfer - truck to overflow concentrate storage                              | Emissions from transfer of copper concentrate to outdoor storage                         | 0.00005               | 0.00054                                |
| Load out from overflow storage                                                | Emissions from the load out of copper concentrate in outdoor storage                     | 0.00011               | 0.00108                                |
| South Reverts                                                                 | Wind erosion at south reverts crushing area                                              | 0.00081               | 0.00544                                |
| South Reverts                                                                 | Reverts transfer from truck to storage piles-south                                       | 0.00029               | 0.00120                                |
| South Reverts                                                                 | Reverts load out from storage piles-south                                                | 0.00232               | 0.00962                                |
| North Reverts                                                                 | Wind erosion at the North reverts area                                                   | 0.00001               | 0.00004                                |
| North Reverts                                                                 | Reverts transfer from truck to storage piles-north                                       | 0.00014               | 0.00060                                |
| North Reverts                                                                 | Reverts load out from storage piles north by converter area                              | 0.00232               | 0.00962                                |
| Cold Dope Reverts                                                             | Wind erosion at the Cold Dope reverts area                                               | 0.00001               | 0.03849                                |
| Cold Dope Reverts                                                             | Reverts transfer from truck to storage piles-cold dope                                   | 0.00014               |                                        |
| Cold Dope Reverts                                                             | Reverts load out from storage piles- cold dope by converter area                         | 0.00029               |                                        |
| SmithCo Reverts                                                               | Reverts operations carried out by contractor                                             | 0.06505               |                                        |
| Wet/Dry Bins #1                                                               | Emissions resulting from wind erosion                                                    | 0.00805               | 0.00225                                |
| Wet/Dry Bins #1                                                               | Emissions from load out of scrubber slurry                                               | 0.00003               |                                        |
| Wet/Dry Bins #2                                                               | Emissions resulting from wind erosion                                                    | 0.00732               |                                        |

| 2026 Projected Hayden Pb Nonattainment Point Source Emission Inventory |                                            |                |                                 |
|------------------------------------------------------------------------|--------------------------------------------|----------------|---------------------------------|
| Process Fugitive Emissions (in tons)                                   |                                            |                |                                 |
| Source                                                                 | Description                                | 2017 Emissions | 2026 Facility Potential to Emit |
| Wet/Dry Bins #2                                                        | Emissions from load out of scrubber slurry | 0.00001        |                                 |
| Filter Plant                                                           | Emissions resulting from wind erosion      | 0.00262        |                                 |
| Filter Plant                                                           | Emissions from load out                    | 0.00001        |                                 |
| Process Fugitive Emissions Total                                       |                                            | 0.13494        | 0.16187                         |

Table 3-7 Projected Point Source Emissions Summary

| 2026 Projected Hayden Pb Nonattainment Point Source Emission Inventory |                |                                 |
|------------------------------------------------------------------------|----------------|---------------------------------|
| Point Source Emissions (in tons)                                       |                |                                 |
| Source                                                                 | 2017 Emissions | 2026 Facility Potential to Emit |
| Smelter Stack & Fugitive Emissions                                     | 3.9815         | 3.3779                          |
| Process Fugitive Emissions                                             | 0.1349         | 0.1619                          |
| Facility Road Emissions                                                | 0.083          | 0.2103                          |
| Point Source Emissions Total                                           | 4.1994         | 3.7501                          |

## 3.2 Nonpoint Source Emissions

Nonpoint sources in the NAA are relatively insignificant when compared to the remaining source categories, making up 3.7 percent of the NAA emissions. ADEQ quantified the nonpoint source category using 2017 NEI data. Table 3-7 summarizes the base year emissions from this source category.

ADEQ employed a population allocation method to all of the area sources within the NAA to determine their estimated future contribution to Pb emissions in the NAA. The projection method used gave approximately a 17 percent decrease in emissions to the attainment year. Table 3-8 represents ADEQ's estimates of projected emissions for area sources within the Hayden NAA in 2026.

Table 3-8 Projected Area Source Emissions

| 2017 Projected Hayden Pb Nonattainment Area Source Emission Inventory |                                                               |                |                          |
|-----------------------------------------------------------------------|---------------------------------------------------------------|----------------|--------------------------|
| Area Source Emissions (in tons)                                       |                                                               |                |                          |
| Source                                                                | Description                                                   | 2017 Emissions | 2026 Projected Emissions |
| Gas Stations                                                          | Storage and Transport-Petroleum and Petroleum Product Storage | 0.000006       | 0.000005                 |
| Industrial Processes - NEC                                            | Miscellaneous Industrial Sources                              | 0.001570       | 0.001310                 |

| 2017 Projected Hayden Pb Nonattainment Area Source Emission Inventory |                                  |          |          |
|-----------------------------------------------------------------------|----------------------------------|----------|----------|
| Area Source Emissions (in tons)                                       |                                  |          |          |
| Industrial Processes - Non-ferrous Metals                             | Miscellaneous Industrial Sources | 0.167164 | 0.139481 |
| Miscellaneous Non-Industrial NEC                                      | Miscellaneous Area Sources       | 0.000011 | 0.000010 |
| Area Source Emissions Total                                           |                                  | 0.168751 | 0.140806 |

### 3.3 Mobile Sources

Historically, on-road and off-road mobile sources were a potential source of Pb emissions due to leaded fuel. ADEQ did not inventory or model Pb emissions from on-road vehicles because leaded gasoline was completely phased out by 1996 and, thus, is not calculated as a pollutant in the EPA MOVES model used to quantify mobile source emissions. Currently, the only fuels allowed to contain lead are those used in non-road applications. The nonroad source category consists of emissions from piston aircraft and makes up 0.1 percent of the NAA emissions.

Like nonpoint sources, mobile sources in the Hayden NAA were also a minor source of Pb emissions in 2017, with total emissions of 0.0152 tons, accounting for less than 1 percent of total annual Pb emissions in the NAA. Mobile source emissions slightly increase but remain very minor in 2019, with a combined contribution of around 0.02 tons (see Table 3-9 below).

Table 3-9 Projected Mobile Nonroad Emissions

| Mobile Nonroad Source Emission Inventory |                             |                       |                                 |
|------------------------------------------|-----------------------------|-----------------------|---------------------------------|
| Source                                   | Description                 | 2017 Emissions (tons) | 2026 Projected Emissions (tons) |
| Aircraft                                 | Pinal County Portion of NAA | 0.003311              | 0.002763                        |
| Mobile Nonroad Emissions Total           |                             | 0.003311              | 0.002763                        |

### 3.4 Summary of All Sources

Emissions in the 2021 attainment year are expected to differ from the 2017 base year across all sources. Emissions from mobile and area source categories are both projected to increase due to expected population growth in Gila and Pinal counties. However, even with a significant increase in population, and an increase in emissions from these two source categories, the total contribution from mobile and area sources will remain very low in the 2019 attainment year, with a combined contribution of less than 0.5 percent of total Pb emissions in the NAA.

Emissions from the ASARCO Hayden Operations, the only point source in the NAA, changed significantly based on reconfiguration of the smelting process under the CRP and the application of controls across all emission points under the Consent Decree. ADEQ only used these permit maxima in order to produce conservative projections; there is no specific reason to believe that the facility will approach its permitted limit. Therefore, the comparison of actual and potential emissions should be done with reservation.

ADEQ asserts that the changes implemented as part of the converter retrofit project, fugitive dust plan, and subsequent controls improve the ambient air quality in the town of Hayden.

Table 3-9 contains a summary of base and projected emissions from all source categories in the Hayden NAA.

**Table 3-9: Projected Hayden Pb NAA Emissions Summary**

| Projected Hayden Pb Nonattainment Emission Inventory Summary |                       |                                 |
|--------------------------------------------------------------|-----------------------|---------------------------------|
| Source                                                       | 2017 Emissions (tons) | 2026 Projected Emissions (tons) |
| Point                                                        | 4.1994                | 3.7501                          |
| Nonpoint                                                     | 0.1688                | 0.1408                          |
| Mobile Nonroad                                               | 0.0033                | 0.0028                          |
| <b>Hayden Pb NAA Emissions Total</b>                         | <b>4.3715</b>         | <b>3.8937</b>                   |

ADEQ used the 2026 Pb emissions inventory to inform the control measure analysis (see Chapter 4). The 2026 emissions inventory was also used as inputs from the model used for the attainment demonstration (see Chapter 5).

## 4 CONTROL MEASURES

As discussed in Chapter 3, ASARCO's Hayden Operations is the primary source of Pb emissions in the Hayden NAA. Control measures specific to smelter operations provide the emissions reductions necessary to meet the 2008 Pb NAAQS.

The following sections summarize the current and future control measures that are applicable to ASARCO's Hayden Operations, and present ADEQ's analysis that demonstrates how the measures fulfill reasonably available control measure (RACM) requirements.

### 4.1 Requirements

Section 172(c)(1) of the CAA requires that nonattainment area plans include a control strategy that provides for attainment of the NAAQS:

*Such plan provisions shall provide for the implementation of all reasonably available control measures [RACM] as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [RACT]) and shall provide for attainment of the national primary ambient air quality standards.*

EPA has interpreted Section 172(c)(1) to mean that a state must "consider all potentially available measures to determine whether they [a]re reasonably available for implementation in the area, and whether they would advance the [area's] attainment date."<sup>49</sup> RACT is defined as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."<sup>50</sup> EPA has interpreted the terms RACM and RACT as being the level of emissions control that is necessary to provide for expeditious attainment of the NAAQS within a nonattainment area. Courts have upheld this interpretation of the statute with respect to nonattainment SIPs.<sup>51</sup> The "General Preamble" to the 1990 CAA Amendments and other policy and guidance documents describe the general methodology for determining RACM/RACT.

In addition to RACM/RACT provisions, CAA section 172(c)(6) requires that nonattainment plans "include enforceable emissions limitations, and such other control measures, means or techniques ... as well as schedules and timetables for compliance, as necessary or appropriate to provide for attainment of [the NAAQS] by the applicable attainment date ..."<sup>52</sup> This chapter describes the compliance and enforcement schedules for the new emissions reduction measures adopted in this plan as well as those included in the 2017 nonattainment area plan.

EPA recommends that, at minimum, all stationary sources emitting 0.5 tpy or more of Pb emissions should undergo a RACT review.<sup>53</sup> ADEQ focused its RACM/RACT analysis on ASARCO's Hayden Operations because it is the single largest contributor to Pb emissions in the Hayden NAA. ADEQ's full RACM/RACT analysis is described in section 4.7.

<sup>49</sup> See 66 FR 586, page 607 (January 3, 2001); *Sierra Club v. EPA*, 294 F.3d 155, 162-63 (D.C. Cir. 2002).

<sup>50</sup> See 44 FR 53762 (September 17, 1979); 57 FR 13498 (April 16, 1992).

<sup>51</sup> See *NRDC v. EPA*, 571 F.3d 1245, 1252-53 (D.C. Cir. 2009).

<sup>52</sup> See C.A.A. § 172(c)(6)

<sup>53</sup> See 73 FR 66964, at 67037 (November 12, 2008).

## 4.2 Identification of Significant Sources

The most significant point source, and most significant source overall, is the primary copper smelter currently owned and operated by ASARCO, which accounts for more than 96 percent of Pb emissions in the nonattainment area. Emissions generally originate from the hot-metal smelting process and lead-bearing fugitive dust.<sup>54</sup>

Nonpoint sources account for less than 4 percent of the nonattainment area's Pb emissions and mobile sources account for less than 1 percent. For this reason, these sources are not considered significant sources and were not included in the control analysis.

The attainment control strategy focuses on ASARCO's Hayden Operations, in particular, the hot metal smelting process and fugitive Pb dust sources. Significant sources or emitting activities within ASARCO's Hayden Operations are identified in the Emissions Inventory (see Appendix A) and summarized in Table 4-1 below along with the corresponding required controls.

**Table 4-1 Summary of Emission Sources/Activities and Required Controls**

| Emissions Source/Activity                  | Controls Applied (2017 SIP)                                                     | Additional Controls Applied (2023 SIP)             |
|--------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------|
| Main Stack                                 | Secondary Hood Baghouse, Improved Primary & Secondary Hooding, Tertiary Hooding | -                                                  |
| Flash Furnace Fugitives                    | Matte Tapping Ventilation System                                                | Secondary Ventilation (Uptake Improvement Project) |
| Converter Aisle Fugitives                  | Secondary Hood Baghouse, Improved Primary & Secondary Hooding, Tertiary Hooding | Fuming-Ladle Hood                                  |
| Anode Furnace Fugitives                    | Improved ventilation system                                                     | Secondary Hoods & Baghouse                         |
| Anode Baghouse Stack                       | Sent to the main stack                                                          | -                                                  |
| Slag Dump                                  | Restrictions on slag dumping location                                           | -                                                  |
| Acid Plant Scrubber Blowdown Solids Drying | Thickener Project                                                               | -                                                  |
| Concentrate storage area                   | Wind fence, water sprays                                                        | -                                                  |
| Bedding area                               | Wind fence, water sprays                                                        | -                                                  |
| Reverts operations                         | Wind fence, water sprays                                                        | -                                                  |
| Paved Roads                                | Sweepers                                                                        | -                                                  |
| Unpaved Roads                              | Chemical Dust Suppressant (on a schedule achieving 90% control efficiency)      | -                                                  |

To assist in a broad understanding of the smelting process and Pb emissions, the following sections present an overview of ASARCO's Hayden Operations and Pb emission points, followed by a description of the current and future controls.

<sup>54</sup> Refer to Chapter 3 and Appendix A of this submittal for more information on the emissions inventory.

## 4.2.1 Overview of Operations and Significant Sources

ASARCO LLC owns and operates a primary copper smelter within the Hayden Pb nonattainment area.<sup>55</sup> The smelter is one of three in the United States and has been operating since the early 1900s, around the same time the Town of Hayden was established. The original facility employed eight multiple hearth roasters and two reverberatory furnaces to process copper sulfide ore. Today the Hayden primary copper smelter utilizes an oxygen flash smelting process as well as converters and anode furnaces to produce anode copper. An oxygen plant produces oxygen for the furnace and a sulfuric acid plant recovers the sulfur dioxide produced during smelting. A water treatment plant recovers process water from both the acid plant and flash furnace gas cleaning systems for reuse. The following subsections (4.2.1.1 and 4.2.1.2) generally describe smelter operations and provide a brief overview of smelting process-related and lead bearing dust emissions sources. Any descriptions of emissions capture and control systems include only those adopted in the 2017 SIP (see Section 4.4). New emissions reduction measures included in this 2023 SIP revision are introduced and described in Section 4.5.

### 4.2.1.1 Smelting Process-Related Emissions

#### ***Mining and Milling***

Copper is used in many facets of everyday life, from plumbing to cell phones and architecture to medicine. To obtain pure copper for these uses, copper-bearing mineral (ore) is mined and processed via sequential beneficiation steps. These steps include size reduction by means of crushing and milling, and a flotation process that separates the metallic mineral from the non-metallic constituent, resulting in a higher-grade product (concentrate) and a waste stream (tailings). ASARCO owns and operates several facilities that mine copper ore and supply copper concentrate to ASARCO's Hayden Smelter.

#### ***Concentrate Feed and Preparation***

Once the concentrate is received at the Hayden Smelter, it is sampled for metal and sulfur content for commercial and metallurgical control purposes. The concentrate is then transported to the bedding plant where a relatively homogenous "mix" of copper concentrate, silica flux, and recycled process by-products is prepared. This mix is the feed material to the INCO Flash Furnace.

#### ***INCO Flash Furnace***

Prior to introduction into the INCO Flash Furnace, the feed material is dried in one of two fluidized bed dryers and recovered in an associated product baghouse. The dried feed is then conveyed to furnace feed bins, one for each of the four burners. Flash smelting occurs when the dried feed is introduced into the INCO Flash Furnace, along with 95 percent pure oxygen, through the burners. Combustible constituents of the feed (predominately sulfur) ignite, providing the heat to melt the feed mixture.

The molten material produced in the flash process separates into two layers, with the lighter top layer being iron-rich slag and the heavier lower layer being copper matte. The slag is skimmed off the top of the molten bath into large pots which are transported to the slag deposition area. The molten copper matte is tapped from the bottom of the furnace into a ladle and transferred via overhead crane to the converter furnaces.

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<sup>55</sup> ASARCO also owns a copper mine, called the Ray Mine, located near the town of Kearny. The mine is included in the Hayden PM<sub>10</sub> nonattainment area and is not a significant source of Pb emissions.

The matte tapping/slag skimming and dryer emissions are routed to a particulate control device (electrostatic precipitator – pre-Converter Retrofit Project (CRP), ventilation gas baghouse – post-CRP)<sup>56</sup> before exiting the 1,000-foot stack annulus. Flash furnace process gases are conditioned through a series of unit operations for particulate removal en route to the acid plant for sulfur dioxide recovery before exiting the 1,000-foot stack center. The gas conditioning system also removes particulate matter on gas streams routed to the acid plant.

### ***Peirce-Smith Converters***

Molten matte, containing approximately 58 percent copper, is transferred to the converters from the flash furnace for further processing. In the converters, air is injected beneath the molten bath through tuyeres to further remove sulfur and other impurities (blowing). The first stage of the converting process (slag blow) yields an iron-silicate slag that is returned to the flash furnace for additional copper recovery. The final stage of the converting process (copper blow) combusts the remaining sulfur to produce blister copper. (The pre-CRP converter department configuration consisted of five Peirce-Smith type converters; the post-CRP configuration replaces the five converters with three larger Peirce-Smith converters.)<sup>57</sup>

Each converter is equipped with primary and secondary hooding systems to ventilate the process. The primary hooding system captures process gases produced during blowing for conditioning through a series of unit operations to remove particulate matter en route to the acid plant for sulfur dioxide recovery. The process operations remove particulate from the converters prior to reaching to acid plant. As with the flash furnace process gas, the resultant acid plant tail gas exits the 1,000-foot stack center. The secondary hooding system captures gases that escape the primary hood during blowing or are emitted when the converter is performing secondary operations such as charging and skimming. Ventilation gases collected by the secondary hooding system report to a baghouse for particulate removal before exiting the 1,000-foot stack annulus. The post-CRP configuration directs secondary hood gases captured during blowing to the acid plant for sulfur dioxide recovery. Secondary hood gases captured during secondary operations (charging and skimming) will still report to the baghouse. A tertiary hooding system was installed (a feature of the CRP) to collect emissions from ladle transfers and/or emissions that may escape the primary and secondary hooding systems to be routed to the 1,000-foot stack.

### ***Anode Furnaces***

Blister copper from the converters is transferred via ladle to the anode refining furnaces (3). The anode refining process consists of an oxidizing stage and a reduction stage called “poling.” Sulfur remaining in the blister copper is further oxidized to a finer endpoint than is achievable in the converter furnaces. Natural gas is then injected into the molten copper to scavenge oxygen that reacted with the copper during converting and the anode oxidizing cycle rather than creating sulfur dioxide, i.e., reducing the copper oxide back to copper. This produces anode copper (more than 99 percent pure) which is cast into anodes on two casting wheels, each with 16 anode molds. The anodes are then transported to ASARCO’s facility in Amarillo, Texas where the copper is further refined before being sold as copper wire or copper cake.<sup>58</sup>

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<sup>56</sup> See Section 4.4.1 for an overview of the Converter Retrofit Project and Consent Decree.

<sup>57</sup> *Id.*

<sup>58</sup> See Making Copper, American Smelter and Refining Company. (2015 Oct. 20) Retrieved: <http://www.asarco.com/about-us/our-locations/asarco-mineral-discovery-center/making-copper/>.

In 2012, ASARCO installed a ventilation system for the anode furnaces to collect process gases and control particulate matter with a baghouse. The baghouse exhausts through a dedicated stack, however the post-CRP configuration routes that exhaust to the 1,000-foot stack annulus.

In addition to smelting process-related emissions, Pb is also emitted from sources not directly part of the smelting process. These sources are generally located outside of the smelter and originate from fugitive dust containing Pb. These fugitive dust sources are discussed further in the next section.

#### 4.2.1.2 Fugitive Leaded Dust Emissions

In addition to the smelting process, Pb emissions also come from sources outside the smelting building. Pb emissions in the form of lead-bearing fugitive dust result from a variety of sources such as materials handling, roads, and reverts crushing. The major sources of lead-bearing fugitive dust at ASARCO's Hayden Operations include slag handling, reverts crushing and handling, concentrate handling, dewatering of scrubber slurry, and roads.:

**Slag handling:** Slag is a byproduct of the smelting process. Slag that is high in copper is segregated in a designated section of the slag deposition area for reprocessing through the Hayden Concentrator, whereas slag that contains little copper is deposited in an area less likely to be reprocessed. Pb emissions can occur when molten slag is poured and cooled at the deposition area. The Consent Decree requires slag to be dumped only in a designated area.<sup>59</sup> Emissions are controlled via ASARCO's Title V permit, which requires throughput restrictions.

**Reverts crushing & handling:** Reverts are copper-bearing process materials that are recovered and returned (reverted) to the smelting process. Reverts typically consist of matte, slag and copper ladle shells; copper oxide slag; launder accretions and cleanup of molten material splashes and spills. Some of the revert material is crushed and reintroduced into the smelting process as flash furnace feed; larger reverts are reintroduced into the converters directly. Revert materials are currently managed outside and stored in open piles susceptible to wind loss. Under A.A.C. R18-2-B1301.01, revert material shall be crushed and stored only within an area protected by a wind fence designed to reduce fugitive emissions. Crushed reverts are required to be wetted to maintained at a nominal 10 percent surface moisture content (which is consistent with other PM<sub>10</sub> rules; see section 4.7.3.3). Uncrushed reverts, considering their large mass, are required to be wetted to minimize emissions to the greatest extent practicable. Reverts must also be crushed and crushed reverts must be stored on concrete pads. These requirements are also mandated by the Consent Decree.

**Concentrate handling:** Concentrate is the primary copper-containing material that comprises the flash furnace feed. The Hayden Smelter receives concentrate by trucks and/or rail from other ASARCO operations and outside sources. Concentrate is stored in open piles northwest of the smelter (the concentrate storage area). Concentrate typically has high moisture content, and the storage piles receive supplemental wetting as necessary to mitigate dust emissions, however, potential Pb emissions can result from wind loss and loading/unloading operations in this area. Under A.A.C. R18-2-B1301.01, concentrate shall be stored only within an area protected by a wind fence and wetted to maintain a nominal 10 percent surface moisture content. Concentrate must also be stored on concrete pads. These requirements are also mandated by the Consent Decree.

**Dewatering of scrubber slurry:** Process gases from the flash furnace and converters are cleaned of particulate before being treated at the sulfuric acid plant. Particulate-laden slurry resulting from the gas

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<sup>59</sup> See Appendix B of Consent Decree, Number 21.

cleaning operations, termed “acid plant blowdown”, is routed to a cone settling system at the filter plant. The underflow from the cone settlers is collected via a vacuum truck and transported to one of the concrete solar drying pads where the material is air-dried. Once the material is relatively dry, it is bagged and sold to other facilities for metals recovery. The potential Pb emissions from this system occur through the material transfers and track-out onto paved roadways where the material dries and becomes susceptible to wind erosion.

ASARCO installed a new acid plant scrubber blowdown system consisting of a venturi scrubber that reports to a new thickener. Underflow from the thickener goes to a filter press for further liquid removal, with the resulting filter cake being electrically dried and discharged directly into bags. Since the thickener project (or wet gas cleaning system/plant) became operational, acid plant scrubber blowdown solids are not allowed to dry in open outdoor storage, which greatly reduces fugitive Pb emissions. This control is required under A.A.C. R18-2-B1301.01 and the Consent Decree.

**Roads:** ASARCO’s Hayden Operations’ roadways are primarily paved, with a few unpaved roads that see heavy equipment traffic. The major source of Pb emissions from roadways is track-out and spillage onto paved roadways from material handling and storage operations. Such material can become airborne as a result of windy conditions and/or vehicle traffic. Under A.A.C. R18-2-B1301.01, spillage on paved roads must be cleaned up, at minimum, at the end of every workday. Track-out from the bedding area is mitigated through rumble grates. Paved roads must be cleaned daily. Unpaved roads are controlled via chemical dust suppressants, verified through a soil stabilization test. Should any area of unpaved road be broken down, chemical dust suppressants must be reapplied.

In all, ASARCO’s Hayden Operations include: a 29,000 ton/day concentrator and a 693,500 ton/year copper smelter consisting of an oxygen flash furnace, converters, anode casting, oxygen plant, acid plant, and associated facilities. The operations produce over 300 million pounds of copper annually.<sup>60</sup>

### 4.3 Control Measures Implemented Prior to 2015

During development of the 2017 SIP, the Hayden smelter operated under a Title V permit<sup>61</sup> issued by ADEQ in 2001. The Hayden smelter was also regulated under A.A.C. R18-2-715 (*Standards of Performance for Existing Primary Copper Smelters; Site-Specific Requirements*) and R18-2-715.01 (*Standards of Performance for Existing Primary Copper Smelters-Compliance and Monitoring*),<sup>62</sup> these rules applied primarily to SO<sub>2</sub> emissions and were amended to update emission limits and control strategies for the 2010 SO<sub>2</sub> NAAQS.

Prior to 2015, process-related Pb emissions are controlled through the devices listed below. Figure 3-1 depicts ASARCO’s operations prior to the Converter Retrofit Project.<sup>63</sup>

- An R&R Cottrell electrostatic precipitator (ESP) captures PM from the flash furnace, matte tapping/slag skimming operations, and concentrate dryers

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<sup>60</sup> See Hayden Operations, American Smelter and Refining Company. (2015 Aug. 17) Retrieved: <http://www.asarco.com/about-us/our-locations/hayden-operations/>.

<sup>61</sup> See Operating Permit No. 1000042, issued by the Arizona Department of Environmental Quality to ASARCO on October 9, 2001.

<sup>62</sup> Sections (F), (G), and (H) of R18-2-715 were approved into the Arizona SIP on September 23, 2014 (79 FR 56655). Rule R18-2-715.01 was approved into the Arizona SIP on November 1, 2004 (69 FR 63321).

<sup>63</sup> Diagram courtesy of ASARCO, LLC.

- Primary hooding that collects process gases from the converters and routes them through the gas cleaning system and then the acid plant
- Secondary hooding that routes emissions to a baghouse for particulate control
- Anode furnaces baghouse that ventilates and captures PM emissions from the anode furnaces

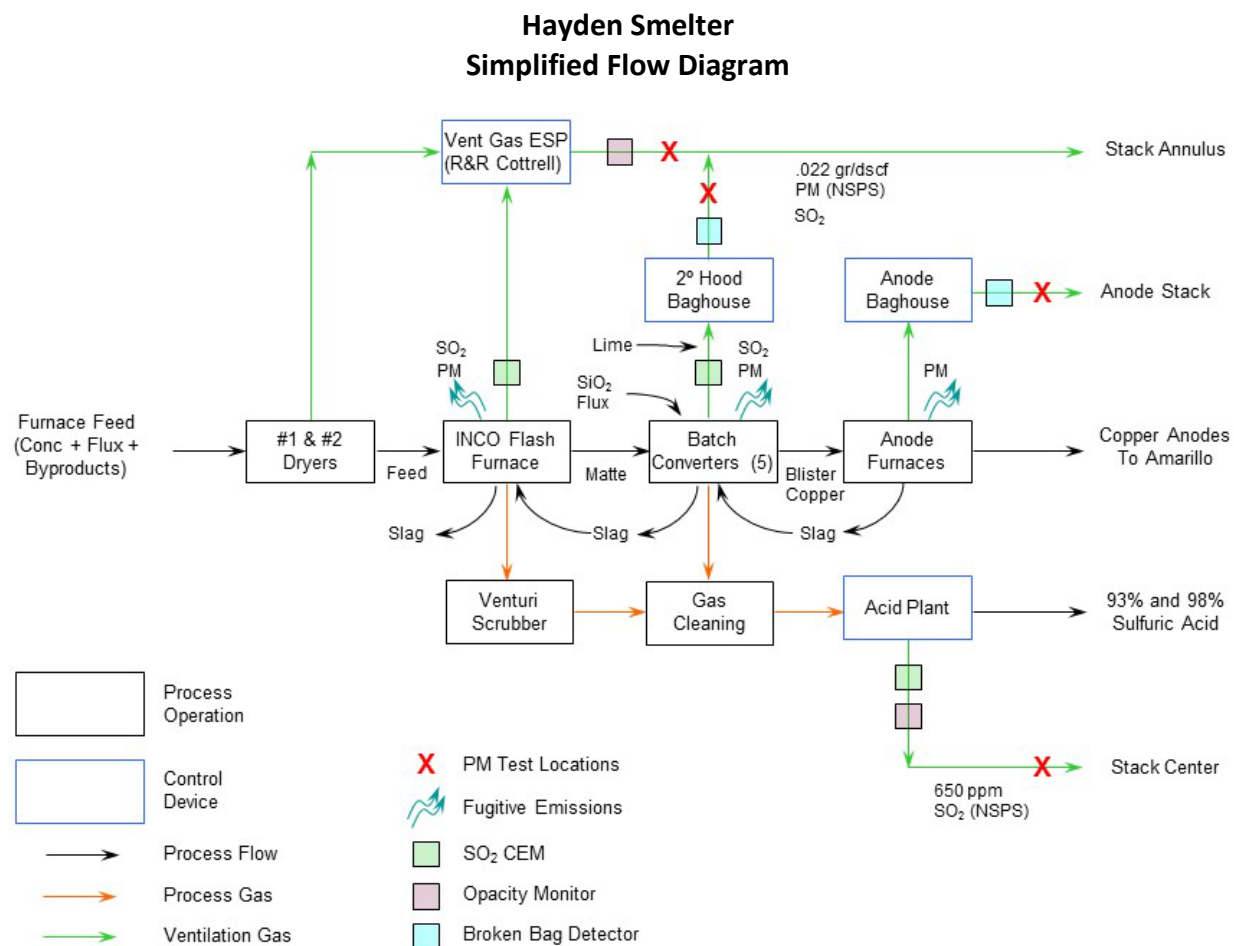


Figure 3-1 Diagram of ASARCO's Operations Pre-CRP

ASARCO's 2001 Title V permit required these controls, as well as additional requirements for fugitive dust sources as a means to control Pb and PM emissions. ASARCO was required to take reasonable precautions to ensure that PM did not become airborne. ADEQ's rules regulating PM emissions are in the Arizona Administrative Code, Article 6, "Emissions from Existing and New Nonpoint Sources."<sup>64</sup> Such reasonable precautions in ASARCO's Title V permit included:

- 20 percent opacity limit
- Chemical dust suppressants on unpaved roads
- Wetting of paved roads
- Using spray bars or wetting agents when crushing or handling materials
- Operating machinery with minimal fall of material
- EPA Method 9 observations for visible emissions

In order to demonstrate attainment by the original 2019 attainment date, ADEQ developed a main stack emission limit and incorporated controls from a Consent Decree into two new rules, A.A.C. R18-2-B1301 and A.A.C. R18-2-B1301.01, applicable to ASARCO's Hayden Operations. These control measures, submitted to support the 2017 nonattainment area plan, are discussed further in section 4.4.

#### 4.4 Control Measures Included in the March 2017 SIP Revision

##### 4.4.1 Consent Decree and Converter Retrofit Project

Shortly after the adoption of the 2010 SO<sub>2</sub> NAAQS, ASARCO enlisted Gas Cleaning Technologies, Inc. (GCT) to review pollution control technology around the world in an effort to devise the best strategy to minimize SO<sub>2</sub> emissions at the Hayden Smelter. As a solution, GCT developed the Converter Retrofit Project (CRP), which was designed to help the Hayden smelter attain the new SO<sub>2</sub> NAAQS.

Smelter operations were originally permitted as a major source of criteria pollutants and minor source for hazardous air pollutants. During ADEQ's permit review and renewal process in November 2011, EPA concluded that the smelter should instead be classified as a major source of hazardous air pollutants and issued a Finding of Violation against ASARCO. This finding resulted in a settlement with EPA (Consent Decree), filed in November 2015, intended to address any additional required provisions in the facility's Class I permit.<sup>65</sup>

The consent Decree, which was finalized before the CRP was fully permitted, primarily requires ASARCO to implement pollution controls for hazardous air pollutants (HAPs), which include lead (Pb), particulate matter (PM), and SO<sub>2</sub>. As part of the Consent Decree process, ASARCO and GCT reworked the CRP to address three goals: (1) to help ASARCO comply with the 2010 SO<sub>2</sub> NAAQS; (2) the 2008 Pb NAAQS; and (3) the Consent Decree with EPA. Ultimately, the CRP and the associated improved control technology aimed to mitigate harmful air pollutants in the Hayden nonattainment area. Because Pb compounds are found in PM emissions from the smelting process and fugitive dust, ASARCO developed controls to reduce PM emissions as a surrogate for Pb.

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<sup>64</sup> See, in particular, A.A.C. R18-2-604, "Open Areas, Dry Washings, or Riverbeds"; R18-2-605, "Roadways and Streets"; R18-2-606, "Material Handling"; and R18-2-607, "Storage Piles."

<sup>65</sup> See Consent Decree, United States of America v. ASARCO LLC, CV-15-02206-PHX-DLR (D. Ariz. 2015). A copy of the Consent Decree is available at: <https://www.epa.gov/enforcement/ASARCO-llc-settlement>.

On June 24, 2014 ASARCO submitted a Class I Significant Permit Application to ADEQ, proposing upgrades to enhance the emission capture and control systems at the Hayden Smelter facility. ASARCO's permit was subsequently revised in December 2015 to incorporate the CRP.<sup>66</sup> The control measures from the consent decree and CRP are also considered in the emissions limits and requirements in rule A.A.C. R18-2-1301 that was developed for the 2017 SIP revision and discussed further in Section 4.4.2.<sup>67</sup>

In June 2016, ASARCO submitted a proposed Fugitive Dust Plan to EPA in compliance with the Consent Decree. The proposed Fugitive Dust Plan details the control strategy for sources of fugitive dust. The Fugitive Dust Plan-related controls are considered in the requirements in rule A.A.C. R18-2-B1301.01 that was also developed for the 2017 SIP revision and discussed in Section 4.4.2.<sup>68</sup>

In 2016, ASARCO began equipment procurement and construction on the CRP. Overall, the CRP and adjunct projects included:

- Replacing the five existing Peirce-Smith converters with three larger 15x35 foot Peirce-Smith converters. This change allows a single converter to blow at a time, better matching the process gas volume from the converters to the gas processing capacity of the acid plant. Two new air blast blowers and a new delivery system were also installed.
- Modifying the converter aisle to fit the new larger converters and the updated primary and secondary hooding systems. Modifications include lowering the aisle grade by six feet, installing shorter crane rail girders, enhancing building column foundations, installing new sheeting to reduce the aisle opening, and modifying the roof above the new converters to create canopy hoods for the new tertiary hooding system.
- Installing a new tertiary hooding system to capture converter aisle emissions not collected by the primary or secondary hooding systems e.g., emissions from ladle movements of molten material along the aisle, for routing to the annulus of the main stack.
- Improving the matte tapping, slag skimming ventilation system to reduce fugitives and to direct emissions to a new vent gas baghouse, which replaced the previous electrostatic precipitator (ESP). The new vent gas baghouse has a higher control efficiency than the ESP and further reduces particulate emissions.
- Installing a new converter primary gas system to a new gas cleaning plant. New water-cooled primary hoods with a dedicated cooling tower will also be installed. These units would be close-coupled to evaporative cooling spray chambers followed by a common 4-field hot ESP with dust handling systems.

Figure 3-2 below depicts ASARCO's operations with CRP improvements.<sup>69</sup>

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<sup>66</sup> See Significant Permit Revision No. 60647 to Operating Permit No. 1000042 issued by the Arizona Department of Environmental Quality to ASARCO on December 28, 2015, available upon request at ADEQ's Records Center.

<sup>67</sup> Final rules were published on April 7, 2017. ADEQ renewed work on a Title V permit renewal for the facility in December 2017. The permit (No. 39948) was finalized and issued in April 2018.

<sup>68</sup> *Id.*

<sup>69</sup> Diagram courtesy of ASARCO, LLC.

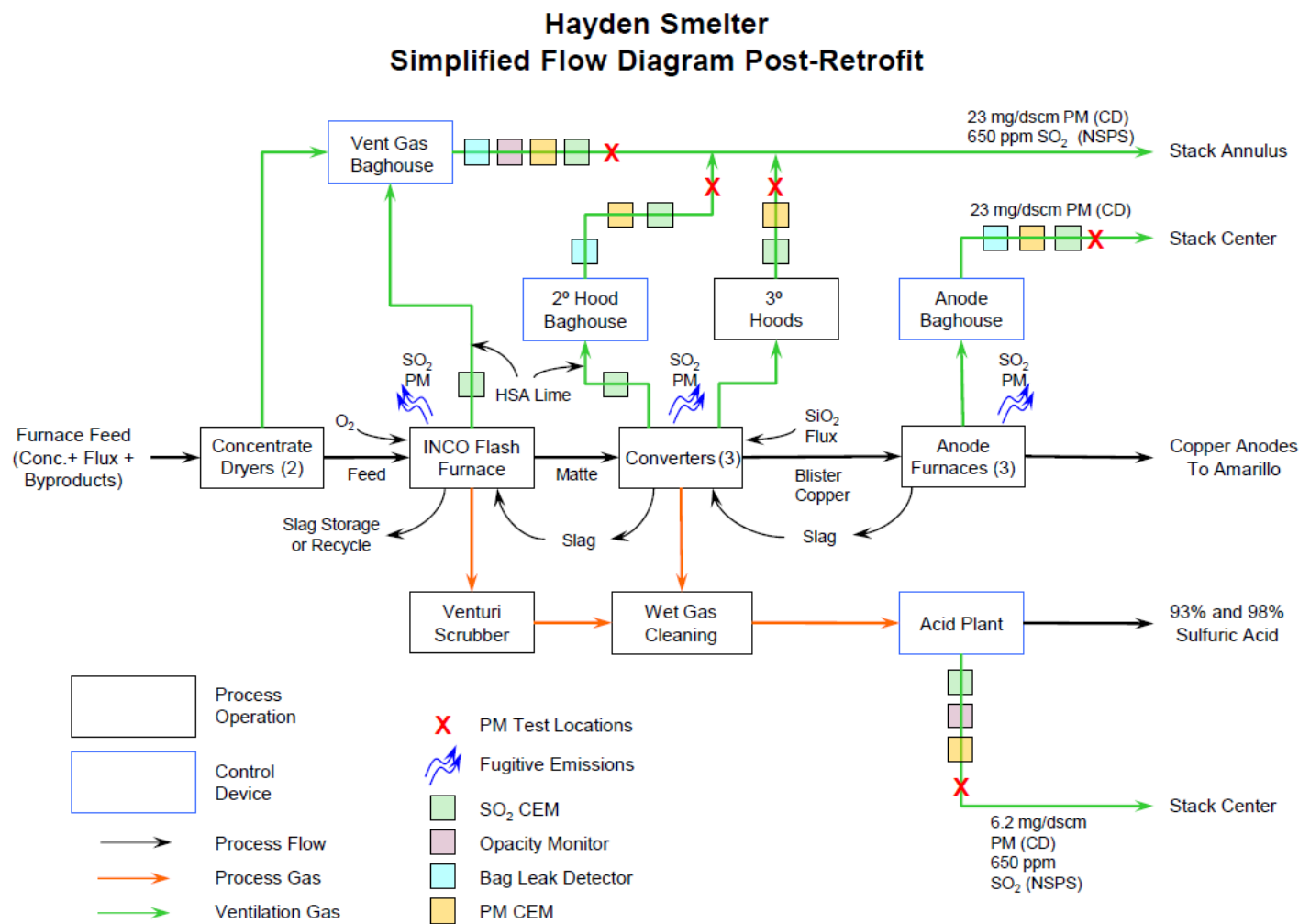


Figure 3-2 Diagram of ASARCO's Operations Post-CRP

Concurrent with the CRP, ASARCO modified its acid plant scrubber blowdown drying system to improve the processing of solids removed from the ventilation gases before going to the acid plant. ASARCO dries blowdown solids only in an enclosed system that is maintained under negative pressure to avoid emitting fugitives. Overall, the system<sup>70</sup> entails:

- A venturi scrubber in which slurry goes to a new thickener;
- The underflow from the thickener goes to a filter press for further liquid removal, and the resulting filter cake is sent to electric dryers to provide final drying;
- The exhaust from the dryers is sent to the converter ID fan inlet duct; and,
- The dried cake is discharged directly into supersack bags.

The Consent Decree also requires ASARCO to develop and comply with a Fugitive Dust Plan to control lead-bearing fugitive dust surrounding the smelter building. Such control measures from the Plan and incorporated in A.A.C. R18-2-B1301.01 include:

- Wind fences to encircle materials storage piles
- Water sprays to wet materials piles
- Chemical dust suppressants for unpaved roads
- Cleaning of paved roads
- Concrete pads for select materials storage areas
- 20 percent opacity limit
- Preventative maintenance procedures for control measures
- Specific inspections for each source
- Speed limit of 15 mph for vehicles
- Ambient air and meteorological monitoring

The Hayden smelter currently operates under a permit issued by ADEQ in April 2018.<sup>71</sup> This permit is a Class I major source operating permit in accordance with Title V of the CAA. The 2018 permit renewal for the facility incorporated control provisions used to comply with the Consent Decree and CRP as well as the emission limits and emissions mitigation requirements contained in rules A.A.C. R18-2-B1301 and R18-2-B1301.01 discussed further in section 4.4.2 below.

#### 4.4.1.1.1 Lead Control Rules (2017 SIP Revision)

The control measures from the Consent Decree were included in the 2017 SIP and incorporated into A.A.C. R18-2-B1301, R18-2-B1301.01, and associated rules to ensure enforceability after the termination or expiration of the Consent Decree. The rules are summarized in Table 4-2 and described in further detail in Sections 4.4.2.1 and 4.4.2.2.

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<sup>70</sup> By December 2016, this system was installed and operational.

<sup>71</sup> See permit renewal No. 39948.

**Table 4-2 Lead (Pb) Emissions Control Rules Included in the 2017 SIP**

| Rule Added to the Arizona SIP                                                                            | SIP Rule(s) Replaced | Amended by Notice of Final Rulemaking | EPA Approval ( <i>Federal Register</i> ) |
|----------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------|------------------------------------------|
| A.A.C. R18-2-B1301.<br>Limits on Lead Emissions from the Hayden Smelter                                  | None                 | 23 A.A.R. 767<br>(April 7, 2017)      | 83 FR 56736<br>November 14, 2018         |
| A.A.C. R18-2-B1301.01.<br>Limits on Lead-Bearing Fugitive Dust Emissions from the Hayden Smelter         | None                 | 23 A.A.R. 767<br>(April 7, 2017)      | 83 FR 7614<br>February 22, 2018          |
| Appendix 14.<br>Procedures for Sulfur Dioxide and Lead Fugitive Emissions Studies for the Hayden Smelter | None                 | 23 A.A.R. 767<br>(April 7, 2017)      | 83 FR 56736<br>November 14, 2018         |
| Appendix 15.<br>Test Methods for Determining Opacity and Stabilization of Unpaved Roads                  | None                 | 23 A.A.R. 767<br>(April 7, 2017)      | 83 FR 7614<br>February 22, 2018          |

#### 4.4.1.2 Overview of R18-2-B1301 Requirements

Rule R18-2-B1301 is designed specifically for the ASARCO copper smelter and addresses Pb emissions from the hot smelting of copper process. The rule establishes an emission limit for the main stack and requires ASARCO to develop an operations and maintenance plan for each capture system and control device. The following provides a description of rule R18-2-B1301 requirements:

**Emission limit:** The rule specifies a numeric emissions limit for the main stack, which is 0.683 pound of lead per hour. This emission limit is based on facility calculations and Potential to Emit values, of which were modeled to demonstrate attainment in the 2017 SIP. The form of the limit is based on a per hour basis to conform with stack testing requirements.

**Operational standards:** At all times, including periods of startup, shutdown and malfunction, ASARCO must operate its smelter and control equipment in a manner consistent with good air pollution control practices to minimize Pb emissions. ASARCO shall develop and implement an operations and maintenance (O&M) plan that sets requirements for each capture system and control device, in addition to inspections, preventative maintenance, and monitoring devices. A similar operations and maintenance plan requirement is mandated by the Consent Decree.<sup>72</sup> The O&M plan, and any plan revisions, are required to be reviewed by ADEQ. The rule requires the owner or operator to submit to the Department for approval a plan revision with changes, if any, to the initial volumetric flow monitoring provisions and initial operational limits in subsection not later than six months after completing a fugitive emissions study conducted in accordance with Appendix 14.

ADEQ, ASARCO, and EPA Region 9 developed a list of operational parameters required to be included in the O&M plan, required by the rule, to provide assurance of fugitive emissions control. Appendix 14 serves as the mechanism to measure and confirm amount of fugitive emissions emitted. Appendix 14 and the rule both contain requirements that should any operational parameters need to change in order to stay consistent with modeled fugitive emissions after a fugitive emissions study, the owner or operator must

<sup>72</sup> See Section IV, Number 27 in Consent Decree, United States of America v. ASARCO LLC, CV-15-02206-PHX-DLR (D. Ariz. 2015).

submit such changes to ADEQ for approval, and then ADEQ must submit such changes to EPA Region 9 as a SIP revision.

**Compliance methods:** To demonstrate compliance with the main stack emission limit, ASARCO is required to conduct annual performance testing on the gas streams that are routed to the main stack (acid plant tail gas, vent gas baghouse, anode furnace baghouse, tertiary hooding, secondary hooding baghouse). ASARCO must calculate the combined results from the tests in pounds per hour to determine if emissions are at or below the limit. The results from the most recent stack test is used to determine compliance.

EPA, ASARCO, and ADEQ, determined that annual stack testing was the only viable option to verify compliance with the main stack limit. The required Continuous Emissions Monitoring Systems (CEMS) installed at the facility measures SO<sub>2</sub> (required by the Consent Decree), however there are no monitoring systems available or required to be installed for Pb emissions. While the modeled emission limit for the main stack was the highest out of all the sources (as of the 2017 SIP modeling), the modeled limit was based on ASARCO's requested Potential to Emit (PTE) and is the facility's maximum permitted amount to emit.

To ensure that fugitive emissions are controlled, ASARCO must maintain and operate the capture and control equipment in accordance with the O&M plan. Additionally, ASARCO must conduct fugitive emissions studies in accordance with Appendix 14 to demonstrate that fugitive emissions are consistent with modeled emissions in the SIP's attainment demonstration.

The fugitive emissions study required by Appendix 14 is consistent with requirements in the Consent Decree, but also requires ASARCO to analyze the operational parameters to ensure they are reliable indicators of control equipment operations and that the control equipment are operating accordingly to minimize fugitive Pb emissions. ASARCO is required to submit a fugitive emissions study protocol to ADEQ and EPA for review and approval at least six months before conducting a study, which is also consistent with Consent Decree requirements. The study must evaluate the smelting process that includes the flash furnace, converters, and anode furnaces. After completion of a fugitive emissions study, ASARCO must compile a report that includes the resultant emissions, descriptions of operational parameters, and an analysis of whether the results from the study demonstrate that the operational parameters confirm that fugitive emissions are consistent with modeled fugitive Pb emissions required to demonstrate attainment. If the analysis shows that operational parameters do not ensure consistency with modeled limits, ASARCO must conduct modeling to ensure that the resultant emissions still provide protection of the Pb NAAQS. ASARCO must submit such modeling to ADEQ and EPA for review and approval. If the revised emissions show that attainment is still met, then ADEQ will submit the revised emissions data, modeling demonstration, and operational parameters as a SIP revision to EPA.

**Recordkeeping and reporting:** Rule R18-2-B1301 requires recordkeeping for the O&M plan, emissions limit compliance calculations, control device maintenance activities, performance tests results, Appendix 14 fugitive emissions study protocols and results, and occurrence of startup and shutdown events.

ASARCO must provide semiannual reports pertaining to the construction of control equipment, notification of the start of such construction and initial startup, notification of any emission limit exceedance(s), quarterly reports of deviations of operations, and performance testing results.

#### 4.4.1.3 Overview of R18-2-B1301.01 Requirements

Rule R18-2-B1301.01 was developed to control lead-bearing fugitive dust emissions occurring at the ASARCO copper smelter. ASARCO must comply with the rule no later than December 1, 2018. The

following provides a description of rule R18-2-B1301.01 requirements, which are closely tied to the Consent Decree.

**Operational standards:** At all times, ASARCO must operate and maintain Pb fugitive dust sources and related control equipment in a manner consistent with good air pollution control practices to minimize Pb emissions and in accordance with a fugitive dust plan required by R18-2-B1301.01. The fugitive dust plan must address major sources of leaded fugitive dust, including paved and unpaved roads, concentrate piles, uncrushed and crushed reverts, the acid plant scrubber blowdown solids, and bedding area. The plan must detail the controls used to minimize emissions, include design plans of controls, any necessary modifications to certain controls, sample inspection sheets, preventative maintenance procedures, and physical inspections. The fugitive dust plan is also required by the Consent Decree.<sup>73</sup>

Both R18-2-B1301.01 and the Consent Decree require a fugitive dust plan. The difference between the two regulations is that the Consent Decree may be terminated or expire. The requirements for the fugitive dust plan contained in R18-2-B1301.01 will continue past the Consent Decree. Additionally, the housekeeping and performance requirements for sources covered under the R18-2-B1301.01 fugitive dust plan are independently required in the rule, regardless of a dust plan, to provide further protection of the NAAQS.

**Physical inspection requirements:** The rule sets specific inspection frequencies, for example: Daily inspections of water sprays, material storage piles, conveyor systems, rumble grates, paved roads, unpaved roads, and material handling areas; weekly inspections of wind fences; and bi-weekly inspections of the acid plant scrubber blowdown drying system building. As part of the fugitive dust plan, ASARCO must include sample inspection sheets for each required inspected source as well as keep such inspection sheets as records. The frequency of these inspections match those in the Consent Decree.<sup>74</sup>

**Ambient air monitoring:** Ambient Pb concentrations must be monitored in four locations already established (and required by the Consent Decree)<sup>75</sup>: ST-14, ST-23, ST-26, and ST-18. Samples of Pb must be collected continuously (every six days). The samples must be retained for at least three years and submitted to a certified laboratory for analysis. ASARCO is required to keep records of ambient air concentrations of Pb calculated for the applicable rolling average for each monitor.

In addition to ambient air monitors, ASARCO must operate a meteorological station at a location approved by ADEQ to continuously record wind speed and direction. This station is used to collect meteorological data for use in determining high wind events for Pb dust sources. The Consent Decree also requires ASARCO to operate a meteorological station at the Camera Hill location for use in determining high wind events.<sup>76</sup>

**Corrective action requirements:** There are essentially two corrective action provisions in R18-2-B1301.01. First, when ASARCO becomes aware that any provision under the fugitive dust plan is not being met, ASARCO must take prompt corrective action to return to compliance, such as returning water sprayers to their optimal performance, repairing damaged conveyor hooding, cleaning material trackout, or revising the fugitive dust plan itself. This corrective action provision is similar to one provided in the Consent

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<sup>73</sup> See Appendix B of ASARCO Consent Decree, *United States of America v. ASARCO LLC*, CV-15-02206-PHX-DLR (D. Ariz. 2015).

<sup>74</sup> *Id.*, at number 28.

<sup>75</sup> *Id.*, at Appendix B, Fugitive Dust Plan, number 31.

<sup>76</sup> *Id.*, at Appendix B, Fugitive Dust Plan, number 32.

Decree.<sup>77</sup> ASARCO is required by the rule to maintain inspection checklists that detail any corrective actions taken, and also report any corrective actions to ADEQ.

The second corrective action provision in R18-2-B1301.01 is also in the Consent Decree.<sup>78</sup> This provision requires ASARCO to take corrective actions if opacity from any sources covered by the rule exceeds 15 percent, as determined by an EPA Reference Method 9 reading. The corrective action must be taken within 30 minutes of discovery of visible emissions. ASARCO must conduct an analysis to determine what caused the excess visible emissions and implement a control strategy that will avoid future exceedances of the opacity limit. ASARCO may submit a request to ADEQ to modify the fugitive dust plan accordingly.

**Opacity limit:** Opacity from sources covered by the rule cannot exceed 20 percent, as determined by an EPA Reference Method 9 reading (except for unpaved roads, which opacity shall be determined by an EPA-approved soil stabilization test method set forth in Appendix 15 of the rule). A Method 9-certified observer must conduct weekly visible emissions survey of all sources. A similar requirement is in the Consent Decree.<sup>79</sup>

**Housekeeping requirements:** While housekeeping requirements must be addressed in the fugitive dust plan, ASARCO must comply with such housekeeping requirements regardless of the plan. The rule details the modes of control, frequency, and efficiencies. The requirements in the rule mirror those in the Consent Decree.<sup>80</sup> Examples of controls for material piles include concrete pads, wind fences, and water sprays. Unpaved roads must be controlled with chemical dust suppressants and paved roads must be routinely cleaned either by sweeper, vacuum, or wet broom. See R18-2-B1301.01(D) for all housekeeping requirements for all sources of Pb dust.

**Compliance method:** Compliance with provisions in R18-2-B1301.01 is demonstrated through the implementation of all requirements in the fugitive dust plan and implementation of housekeeping requirements in R18-2-B1301.01(D).<sup>81</sup>

**Contingency requirements:** The contingency measure for the Hayden Pb NAA is increasing the frequency of paved road cleaning to twice per day rather than once per day. To ensure that the contingency is implemented without significant action by EPA and/or the State, ADEQ incorporated the requirements in R18-2-B1301.01. However, on January 31, 2022, EPA published a determination that the Hayden Pb nonattainment area failed to attain the 2008 Pb standards by the October 3, 2019 attainment date. The finding of failure to attain triggered the requirement for twice daily road cleaning as specified in subsection R18-2-B1301.01(D)(9). Because twice per day paved road cleaning is already implemented, the measure cannot be used to meet contingency measure goals for the 2023 SIP revision. See section 4.9 for more discussion on the selection of new contingency measures to meet CAA requirements for attaining the 2008 Pb NAAQS by the new attainment date of January 31, 2027.

**Recordkeeping and reporting requirements:** Rule R18-2-B1301.01 requires general recordkeeping and reporting. Such records include those required by the fugitive dust plan, inspection sheets, visible emissions survey results, housekeeping occurrences (i.e. chemical dust suppressant applications, intensity of water sprayers, location of washdowns, etc.), monitoring samples and ambient air concentration

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<sup>77</sup> *Id.*, at number 24.

<sup>78</sup> *Id.*, at number 24.

<sup>79</sup> *Id.*, at number 29.

<sup>80</sup> *Id.*, at numbers 3-4, 6, 7, 10, 14, and 15.

<sup>81</sup> This compliance method is consistent with federal requirements for National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for primary copper smelters. See 40 C.F.R. Part 63, Subpart QQQ.

calculations, meteorological data, and any instances when operations deviated from the fugitive dust plan. These recordkeeping requirements are consistent with those in the Consent Decree.

On a quarterly basis, ASARCO is required to report to ADEQ instances where fugitive dust emissions exceeded 15 percent opacity, dates of high wind events, recounts of corrective actions taken and their successes, results of ambient air concentration calculations and meteorological data, a summary of when recordkeeping systems were not operating, and progress reports on new construction of control measures for fugitive dust sources.

#### 4.4.1.4 Enforceability

The following sections address enforceability requirements<sup>82</sup> for R18-2-B1301 and R18-2-B1301.01, which are both applicable to ASARCO's Hayden Operations.

##### 4.4.1.4.1 Authority

ADEQ has broad statutory authority to adopt and implement both rules under A.R.S. § 49-104 and § 49-106. Additionally, ADEQ possesses statutory authority under A.R.S. § 49-425 to adopt rules that are necessary to reduce air pollution. While the Hayden Pb NAA includes townships in both Gila and Pinal Counties, under A.R.S. § 49-402, ADEQ has jurisdiction over ASARCO's Hayden Operations.

Additionally, ADEQ has authority to carry out the necessary investigations, inspections, and enforcement of any rules and permit provisions. Such authority includes those defining violations and processes for violation consequences such as A.R.S. §§ 49-460 – 464.

##### 4.4.1.4.2 Applicability

Rules R18-2-B1301 and R18-2-B1301.01 apply to the owner or operator of the primary copper smelter in Hayden, AZ. At the time of the 2017 SIP revision and the development of the 2023 Hayden Pb SIP revision, the smelter is owned and operated by ASARCO LLC.

##### 4.4.1.4.3 Compliance Date and Implementation Schedule

Nonattainment plans contain legally enforceable compliance schedules by which all sources must comply with any applicable requirement of the plan.<sup>83</sup> Rule R18-2-B1301 is effective on the earlier of July 1, 2018 or 180 days after the completion of project improvements authorized by significant permit revision No. 60647 (R18-2-B1301(A)(2)). Rule R18-2-B1301.01 is effective no later than December 1, 2018 (R18-2-B1301.01(A)(2)). ASARCO's compliance schedule for the rules was greatly influenced by deadlines set forth in the Consent Decree. The compliance schedule of controls is listed in Table 4-3 below.

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<sup>82</sup> See Review of State Implementation Plans and Revisions for Enforceability and Legal Sufficiency, memorandum issued by J. Craig Potter, Thomas L. Adams Jr., and Francis S. Blake, U.S. Environmental Protection Agency. (23 Sept. 1987).

<sup>83</sup> See 40 CFR 51.260.

**Table 4-3 Control Implementation Schedule**

| Control Measure                                                                                                                                  | Implementation Schedule                                                                                                     | Implementation/ Approval Date                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Implementation of chemical dust suppression for unpaved roads                                                                                    | Within 30 days of EPA approval of intensity and schedules in Fugitive Dust Plan <sup>84</sup>                               | April 14, 2018<br>(Element approved by EPA on March 15, 2018) <sup>85</sup>                                                                                  |
| Implementation of wind fences for materials piles (uncrushed reverts, reverts crushing and crushed reverts, bedding materials, and concentrate)  | Within 120 days of EPA approval of the Fugitive Dust Plan or the date of completion in the approved FDP, whichever is later | October 24, 2017 and April 18, 2018<br>(EPA approved the wind fence elements of the fugitive dust plan on June 26, 2017 and December 20, 2017) <sup>86</sup> |
| Implementation of water sprays for materials piles (uncrushed reverts, reverts crushing and crushed reverts, bedding materials, and concentrate) | Within 120 days of EPA approval of the Fugitive Dust Plan or the date of completion in the approved FDP, whichever is later | July 13, 2018<br>(Element approved by EPA on March 15, 2018) <sup>87</sup>                                                                                   |
| Implementation of new acid plant scrubber blowdown drying system                                                                                 | November 30, 2016                                                                                                           |                                                                                                                                                              |
| Implementation of new primary, secondary, and tertiary hooding systems for converter aisle                                                       | July 1, 2018                                                                                                                |                                                                                                                                                              |
| Implementation of new ventilation system for matte tapping and slag skimming for flash furnace                                                   | July 1, 2018                                                                                                                |                                                                                                                                                              |

The 2017 Hayden Pb SIP included a contingency measure as described in Table 4-4. The measure was triggered in January 2022 when the area failed to attain the Pb NAAQS by the applicable attainment date and become a fully implemented part of the control strategy (see Section 1.5). RFP goals and contingency requirements for the new attainment demonstration (2023 Hayden Pb SIP revision) are described in Sections 4.8 and 4.9 below.

<sup>84</sup> The Fugitive Dust Plan referenced in Table 23 above is the Fugitive Dust Plan developed and submitted by ASARCO to EPA to comply with the Consent Decree (see Section IV “Compliance Requirements,” Paragraph 25, “Fugitive Dust Plan.” In the Consent Decree, certain fugitive dust controls must be implemented within a certain amount of time after EPA’s approval of designs and the Fugitive Dust Plan (i.e. within 120 days of approval). Considering the SIP’s control strategy relies heavily on the controls in the Consent Decree, the RFP schedule for the fugitive dust controls (chemical dust suppressants, wind fences, water sprays, new drying system) thus incorporates the schedule mandated by the Consent Decree.

<sup>85</sup> 83 FR 31095-31096 (July 3, 2018).

<sup>86</sup> *Id.*

<sup>87</sup> *Id.*

**Table 4-4 Contingency Measure Implementation Schedule (2017 SIP)**

| Contingency Measure                                                                                             | Scheduled Date of Implementation                                                                                                                                                                                                            | Implementation Date                                                                              |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Increase the paved road cleaning frequency specified in subsection A.A.C. R18-2-1301.01(D)(9) to twice per day. | Within 60 days of notification by EPA Region IX of either a failure to meet the compliance schedule in subsection A.A.C. R18-2-B1301.01(E)(3) or a failure to attain by the attainment date established in the Act, whichever occurs first. | April 1, 2022<br>(EPA published a finding of failure to attain on January 31, 2022 [87 FR 4805]) |

#### 4.4.1.4.4 Standard of Conduct

The provisions of R18-2-B1301 and R18-2-B1301.01 are sufficiently clear so the regulated entity is on notice of all requirements. The 2008 Pb NAAQS became effective on January 12, 2009.<sup>88</sup> The Hayden Pb planning area's nonattainment designation became effective on October 3, 2014.<sup>89</sup> The effectiveness date of the new standard and designation of nonattainment has provided ASARCO sufficient time to determine the appropriate control technology to ensure attainment of the 2008 Pb NAAQS. Furthermore, the appropriate control technology was further developed and dictated by a Consent Decree between EPA and ASARCO, which became effective on December 30, 2015.

#### 4.4.1.4.5 Equivalency Provisions and Discretionary Emission Limits

R18-2-B1301 and B1301.01 do not contain provisions for alternative practices or emission limits.

#### 4.4.1.4.6 Recordkeeping and Reporting

R18-2-B1301(G) requires ASARCO to maintain records for at least five years and keep them on-site for at least two years.<sup>90</sup> ASARCO shall maintain records of its operations and maintenance plans, in addition to all records of maintenance activities and inspections, quality assurance and quality control activities, performance tests, compliance calculations, and any startup, shutdown, and malfunction periods. Furthermore, ASARCO shall report to ADEQ upon the start of construction of any equipment necessary to comply with the operational emission limits. ASARCO must also send semiannual progress reports on such construction postmarked by July 30 for the preceding January – June period and January 30 for the preceding July – December period. Notification to ADEQ is also required of initial startup of any such equipment within 15 business days. Additionally, within 60 days of completing a performance test on smelter equipment, ASARCO shall report results to ADEQ (R18-B1301(H)(6).

Reporting provisions under R18-2-B1301(H) also include a requirement to provide notice to ADEQ of exceedances of emissions limits within 2 business days. There is also a requirement for quarterly reports to ADEQ of any deviations to smelter operations that are inconsistent with the O&M plan as required by B1301(D)(2).

R18-2-B1301.01(H) also requires ASARCO to maintain records for at least five years and keep them on-site for at least two years. Such records shall include fugitive dust plans, physical inspection checklists,

<sup>88</sup> See 73 FR 66964 (November 12, 2008).

<sup>89</sup> See 79 FR 52205 (September 3, 2014).

<sup>90</sup> This requirement is consistent with the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for the primary copper smelter source category, 40 CFR 63.1440 (Subpart QQQ).

logs of preventative maintenance and housekeeping conducted, ambient air monitoring samples and calculations, opacity readings, corrective actions, etc. Then, on a quarterly basis, ASARCO shall submit reports on observed opacity readings that exceeded the opacity limit, any corrective actions taken, and progress summaries on any construction of new equipment aimed to control leaded fugitive dust emissions (R18-2-B1301.01(I)).

#### 4.4.1.4.7 Test Methods

The Hayden primary copper smelter shall comply with the main stack emission limit set forth in R18-2-B1301(C). Main stack emissions shall not exceed 0.683 pound of Pb per hour.

There are no emission limits in R18-2-B1301.01 for leaded fugitive dust sources, however, there is a 20 percent opacity limit required for all sources (R18-2-B1301.01(D)(2)). Additionally, R18-2-B1301.01(C)(2) states that the owner/operator shall develop, implement, and follow a fugitive dust plan that is designed to minimize lead-bearing fugitive dust from non-smelting process sources. This requirement is intended to provide protection of the NAAQS.

The rules contain other provisions regarding compliance and testing requirements. These provisions include requirements for monitoring and compliance demonstrations.

#### **Monitoring requirements**

Requirements for ambient air and meteorological monitoring are in R18-2-B1301.01(F). Similar to Consent Decree requirements, ASARCO is required to monitor Pb concentrations with four monitors. Samples must be collected continuously (24-hour filters placed and collected every six calendar days) in a manner consistent with 40 CFR 58.12. The samples shall be submitted to a laboratory no later than 18 days from the sample's removal from the monitor. ASARCO then shall calculate the applicable rolling average ambient levels of Pb.

Additionally, ASARCO must monitor wind speed and direction with a meteorological station installed and in a location approved by ADEQ (R18-2-B1301(C)(2)(i)). ASARCO must monitor for high wind events in case additional controls or curtailment actions need to be taken for fugitive dust sources covered under R18-2-B1301.01.

#### **Operations and Maintenance (O&M) Plan and Fugitive Dust Plan**

Per R18-2-B1301(D)(2), ASARCO is required to develop an O&M plan for the capture systems and control devices used to control or ventilate emissions from the flash furnace, converters, and anode furnaces. This rule stipulated that the plan shall be submitted no later than May 1, 2018 (R18-2-B1301(D)(2)(e)(ii)). Any revisions to the O&M plan shall be submitted to ADEQ for review, however, revisions can be implemented upon submittal in order to not restrict necessary operations. Changes to certain parameters deemed critical to successful operation of the capture system and control device require prior approval from ADEQ to provide assurance of fugitive emission control.

ASARCO is also required to develop and submit to ADEQ (under the SIP) and EPA (under the Consent Decree) a fugitive dust plan for review (R18-2-B1301.01(C)(2)). Subsection R18-2-B1301.01(C)(2) requires the plan shall include control methods, preventative maintenance procedures, and physical inspections

requirements for fugitive Pb dust sources. The initial fugitive dust plan must be submitted no later than May 1, 2017.<sup>91</sup> Any revisions of the fugitive dust plan must be submitted to ADEQ for review.

### **Compliance Demonstration**

#### ***Main Stack Emission Limit***

R18-2-B1301(C) sets a Pb emission limit (in pounds per hour) for the smelter's main stack. R18-2-B1301(E) provides requirements pertaining to performance testing of the main stack. This subsection requires ASARCO to conduct annual performance tests on the equipment that is routed to the main stack (anode furnace baghouse, acid plant, secondary baghouse, tertiary hooding system, and vent gas baghouse). The performance tests must be conducted in accordance with 40 CFR 60, Appendix A, Reference Method 29 (also referred as EPA Method 29. EPA Method 29 contains mathematical formulas used to determine the amount of Pb within particulate matter samples collected from each piece of equipment. R18-2-B1301(E) contains requirements for the performance tests conducted by Asarco.

#### ***Smelter-Process Fugitives***

Compliance with smelter process-related fugitive Pb emissions measures is shown by meeting the requirements in R18-2-B1301(F). From the performance test as described above, R18-2-B1301(F) requires ASARCO to calculate the combined amount of Pb emitted from the emission points in pounds per hour to determine compliance with the Pb limit. This subsection states that the owner and operator shall determine compliance with the capture system and control devices by maintaining the operating the emissions capture and control equipment in accordance with the operation and maintenance plan required in subsection R18-2-B1301(D)(2) and recording operating parameters for the capture and control equipment set forth in the approved capture and control system operations and maintenance plans as required in B1301(D)(2)(b).

Appendix 14 requires ASARCO to conduct fugitive studies to derive a measurement or accurate estimate of total fugitive Pb emissions from the Hayden smelter during operations, including planned and unplanned start up and shut down periods and malfunctions. The appendix outlines the processes involved and the criteria for conducting the studies. If a fugitive study shows emissions are higher than those used in an approved modeling demonstration, ASARCO must demonstrate that those higher emissions still support attainment or implement additional controls or both. The revised approach must be submitted to ADEQ, and if approved, ADEQ must submit such changes to EPA Region 9 as a SIP revision.

#### ***Leaded Fugitive Dust Compliance***

R18-2-B1301.01 requires ASARCO to demonstrate compliance by implementing all control measures specified in the most current fugitive dust plan. To provide additional protection, the control measures required by the dust plan are also independently required in the rule. To monitor compliance, the rule requires ASARCO to report any observed opacity readings that exceed 15 percent, as well as any corrective actions taken. ASARCO must also maintain records of fugitive dust plan revisions, housekeeping of dust sources, preventative maintenance and inspection procedures, as well as opacity readings.

Considering there are no emission limits for leaded fugitive dust in the rule, R18-2-B1301.01 provides extra security by requiring a 20 percent opacity limit. Furthermore, if any visible emissions appear to exceed 15 percent as evident through a Method 9 reading, ASARCO must take prompt action to control

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<sup>91</sup> Please note that ASARCO submitted its initial proposed fugitive dust plan to EPA and ADEQ in June 2016 to meet Consent Decree deadlines.

the emissions. Additionally, if any provisions of the fugitive dust plan are not being met, ASARCO must make corrective action that brings the area back into compliance. These corrective actions include, but are not limited to, modifications to water sprayers, material trackout cleaning, and reapplying chemical dust suppressants.

#### 4.4.1.4.8 Exemptions

There are no exemptions from rule requirements for the Hayden primary copper smelter.

### 4.5 New Control Measures (2023 SIP Revision)

The Hayden Pb nonattainment area did not reach attainment by the required October 3, 2019 attainment date. The failure to attain requires the evaluation and adoption of any new emissions reduction measures needed to demonstrate attainment of the 2008 Pb NAAQS by the new January 31, 2027 attainment date.

#### 4.5.1 Proposed New Emissions Controls

On December 16, 2022 ASARCO submitted a Class I Significant Permit Application to ADEQ, which proposed additional emission capture and control systems at the Hayden Smelter facility. The following list summarizes the emissions control improvements contained in the permit application. Emissions reductions achieved by these additional measures were determined necessary to support the current attainment demonstration.

##### 4.5.1.1 Uptake Improvement Project

This project entails the installation and ventilation of a partial enclosure around the INCO flash furnace uptake shaft to improve capture of any fugitive emissions from the flash furnace and emissions generated during matte tapping and slag skimming activities (reducing “blow-through” emissions from the flash furnace to the converter aisle). These emissions are ducted to the converter secondary hood baghouse, treated, and released to the annulus of the main stack. The uptake enclosure will be ventilated except during brief periods when slag is returned to the flash furnace. ASARCO’s air pollution control engineering consultant, Gas Cleaning Technologies (GCT), has determined that the converter secondary hood baghouse system can handle the added ventilation point without an increase in system flow capacity or a decrease in effectiveness of capture elsewhere.

Two fugitive emissions studies are required by paragraph 22 of the Consent Decree that was filed on December 30, 2015 in *United States v. ASARCO LLC*, No. CV-15-02206-PHX-DLR (D. Ariz.). The first study was partially completed, prior to the temporary shutdown of the smelter that commenced in October 2019. Data generated during that partially completed study indicated the possibility that emissions from the matte tapping/slag skimming area may occasionally migrate from the flash furnace building into the converter aisle, anode aisle or material transfer area. ASARCO and GCT conservatively estimate that fugitive lead emissions from the flash furnace area will be reduced by approximately 3.3-3.5% compared to pre-Uptake Improvement Project emissions.

##### 4.5.1.2 Fuming Ladle Control Project

This project involves the construction of a hood and retaining walls to capture “fuming” ladle emissions (which sometimes occur after a ladle is poured) from the converter aisle and material transfer area that is located between the converter aisle and the anode furnaces. The hood will be ducted to the converter

secondary hood baghouse, where the additionally captured emissions will be treated to remove particulate matter including lead and then released to the main stack annulus. GCT estimates that fuming ladles contributed substantially to the peak concentrations seen during the partially completed fugitive emissions study and the additional emissions capture and control that will be achieved by this project will substantially reduce that contribution.

The new hood will operate for the brief periods when a fuming ladle is present in the enclosure. It is anticipated that fuming ladles will be vented for 15-minute periods occurring 0 to 5 times per day. Because ventilation air will be toggled between the Uptake Improvement Project and this project, the secondary baghouse system will be able to handle the added ventilation point without an increase in system flow capacity or loss in capture efficiency elsewhere.

ASARCO and GCT estimate that fugitive lead emissions from the converter aisle will be reduced by approximately 15% due to the estimated control from this project and the disproportionate contribution of fuming ladles to particulate emissions and hence lead loading.

#### 4.5.1.3 The Anode Furnaces Secondary Hood Project

This project requires the construction of secondary hoods, similar to those found on the converters, around the anode furnaces, allowing improved capture during operations. The hoods will be ducted to a new anode secondary hood baghouse, where the additionally captured emissions will be treated to remove particulate matter including lead and then released to the main stack annulus. GCT estimates that this project will achieve reductions in fugitive particulate emissions including lead of approximately 70% during peak emissions periods.

The secondary hoods' operation will control emissions previously uncaptured and emitted as fugitives. Release of the captured emissions through the main stack is not expected to cause an exceedance of the 0.683 lb. lead/hour limit in R18-2-B1301(C) or cause a significant impact on ambient lead levels, based on current modeling.

The three projects described above are designed to reduce peak emissions. This will help avoid short-term elevated ambient lead levels and reduce longer-term, quarterly ambient lead concentrations.

## 4.5.2 Emissions Limits

### Main Stack

The proposed permit revision maintains the current limit of 0.683 pound per hour lead from the main stack even though an additional source of emissions, the anode secondary hood baghouse, will be added to the main stack annulus.<sup>92</sup> The proposed permit adds the anode secondary hood baghouse to the existing 2017 Pb SIP compliance demonstration, along with a continuous means of compliance assurance, in order to strengthen the SIP.

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<sup>92</sup> See A.A.C. R18-2-B1301(C).

### Total Process Fugitive/Roofline Emissions

The proposed permit revision will establish total process fugitive lead emissions (from the smelter furnaces and converters) shall not exceed 0.326 lb/hr calculated as a three-month rolling average in accordance with Permit condition IV.A.2.

The rate of PM emissions is a surrogate for the effectiveness of controls for hazardous air pollutants (HAPs), including lead. This surrogacy is demonstrated in EPA's January 2022 proposed revisions to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Primary Copper Smelting (40 CFR 63, Subpart QQQ).<sup>93</sup> However, isokinetic test methods like Method 5 are inappropriate for measuring PM emissions at the Smelter roofline. The explanation for this is included in Attachment 3 of ASARCO's December 16, 2022 permit revision application.

In the absence of a nationally applicable rule that identifies the use of MiniVol Samplers as a reference or equivalent method for determining fugitive emissions rates, the SIP revision for the Hayden Pb NAA and corresponding permit revision will rely on:

1. The construction of the three projects discussed above,
2. The operation of the resulting capture and control mechanisms,
3. Recordkeeping and reporting requirements to demonstrate that the operation of those mechanisms is being conducted according to their design, to ensure the roofline emission rates used in the attainment model will not be exceeded.

ASARCO's permit revision application proposes supplementing work practice standards with numeric emissions limits at the rooflines, if, the results of two 12-month fugitive emissions studies show that MiniVol Samplers are a reliable means of measuring rates of fugitive emissions, specifically at the Hayden roofline.

### 4.5.3 Enforceability

The following sections address enforceability requirements<sup>94</sup> for Significant Permit Revision (SPR) No. 97168, *Attachment "I": Hayden Smelter Site-Specific Sip Requirements*, and *Appendix 1 of Attachment "I"* applicable to ASARCO's Hayden Operations. These elements of ASARCO's Hayden Operations Class I Air Quality Permit (Permit No. 39948 as amended by SPR No. 97168) will be submitted to EPA as a revision to the Arizona SIP.

#### 4.5.3.1 Authority

ADEQ has broad statutory authority to adopt and implement plans for the control of air pollutants under A.R.S. §§ 49-104, 49-404, and 49-424. Additionally, ADEQ possesses statutory authority under A.R.S. § 49-426 to issue permits that are necessary to reduce air pollution. While the Hayden Pb NAA includes townships in both Gila and Pinal Counties, under A.R.S. § 49-402, ADEQ has jurisdiction over ASARCO's Hayden Operations.

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<sup>93</sup> See 87 FR 1616 (January 11, 2022).

<sup>94</sup> See *"Review of State Implementation Plans and Revisions for Enforceability and Legal Sufficiency"*, memorandum issued by J. Craig Potter, Thomas L. Adams Jr., and Francis S. Blake, U.S. Environmental Protection Agency. (23 Sept. 1987).

Additionally, ADEQ has authority to carry out the necessary investigations, inspections, and enforcement of any rules and permit provisions. Such authority includes those defining violations and processes for violation consequences such as A.R.S. §§ 49-460 through 49-464.

#### 4.5.3.2 Applicability

SPR No. 97168 (Attachment “I” and Appendix 1 of Attachment “I”) applies to the permittee of the primary copper smelter in Hayden, AZ. At the time of this (2023) SIP revision, the smelter is owned and operated by ASARCO LLC.

#### 4.5.3.3 Compliance Date and Implementation Schedule

Nonattainment plans should contain a legally enforceable compliance schedule by which all sources must comply with any applicable requirement of the plan.<sup>95</sup> The requirements in Condition IV (Particulate Limits and Lead Work Practice Standards) of SPR No. 97168 shall become effective 60 days after the Hayden Smelter achieves maximum production or 180 days after restart, whichever occurs first.<sup>96</sup> The requirements of Condition IV are state-only enforceable until the effective date the EPA Administrator approves them as part of the state implementation plan for lead control. A compliance schedule for the new controls is included in the RFP discussion in section 4.6.

#### 4.5.3.4 Standard of Conduct

The provisions of SPR No. 97168 are sufficiently clear so the regulated entity is on notice of all requirements. The 2008 Pb NAAQS became effective on January 12, 2009,<sup>97</sup> and the Hayden Pb planning area’s nonattainment designation became effective on October 3, 2014.<sup>98</sup> The effective dates of the new standard and designation of nonattainment has provided ASARCO sufficient time to determine the appropriate control technology to ensure attainment of the 2008 Pb NAAQS.

#### 4.5.3.5 Equivalency Provisions and Discretionary Emission Limits

SPR No. 97168 does not contain provisions for alternative practices or emission limits.

#### 4.5.3.6 Recordkeeping and Reporting

##### ***Recordkeeping Requirements***

Condition IV.F. of SPR No. 97168 contains the provision that the Permittee shall maintain records for at least five years and keep the records on-site for at least two years. This condition applies to the following:

- All records of major maintenance activities and inspections conducted on emission units, capture systems, monitoring devices, and air pollution control equipment, including those set forth in the O&M Plan as required by A.A.C. R18-2-B1301(D)(1)-(3).
- All records of performance tests, test plans, and audits as required by Condition IV.C.
- All output of the PM CEMS required in Condition IV.D.3.
- All records of compliance calculations required by Condition IV.E.

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<sup>95</sup> See 40 CFR 51.260.

<sup>96</sup> See Attachment I: Hayden Smelter Site-Specific SIP Requirements, of SPR. No. 97168.

<sup>97</sup> See 73 FR 66964 (November 12, 2008).

<sup>98</sup> See 79 FR 52205 (September 3, 2014).

- All records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of concentrate drying, smelting, converting, anode refining, and casting emission units; and any malfunction of the associated air pollution control equipment that is inoperative or not operating correctly.
- All records of reports and notifications required by Condition IV.G.
- All Records of the fugitive studies and their supporting data required under Condition IV.D.5.
- After the two fugitive studies are completed, records of daily concentrate processed and operating hours and the corresponding calculation of 30-day average fugitive lead emissions required by Condition IV.E.4.

### ***Reporting Requirements***

Condition IV.G. of SPR No. 97168 requires that the Permittee shall provide the following reports to the Department:

- Notification of commencement of construction of any equipment necessary to comply with the operational or emission limits.
- Semiannual compliance reports on construction of any such equipment postmarked by July 30 for the preceding January-June period and January 30 for the preceding July-December period.
- Notification of initial startup of any such equipment within 15 business days of such startup.
- Whenever the Permittee becomes aware of any exceedance of the emission limit set forth in Condition IV.A, the Permittee shall notify the Department orally or by electronic or facsimile transmission as soon as practicable, but no later than two business days after the Permittee learns about the exceedance.
- Within 30 days after the end of each calendar-year quarter, the Permittee shall submit a quarterly report to the Department for the preceding quarter that shall include dates, times, and descriptions of deviations when the owner or operator operated smelting processes and related control equipment in a manner inconsistent with this permit.
- Reports from performance testing conducted pursuant to Condition IV.C shall be submitted to the Department within 60 calendar days of completion of the performance test. The reports shall be submitted in accordance with A.A.C. R18-2-312(A).
- The Permittee shall submit reports to the Department providing the results of the fugitive studies required in Condition IV.D.5 within six (6) months of completion of each study.
- The Permittee shall submit quarterly, 30 days after the end of each calendar quarter, a summary report showing the date, time and magnitude of any exceedance of the PM CEMS (or approved alternative monitoring system) calculated in accordance with Condition IV.E.2 - 3 and any exceedance of the fugitive parameters calculation in accordance with Condition IV.E.4.
- The Permittee shall submit a report to the Department showing that the contingency measures required in Condition IV.H were implemented within 90 days of receipt of notice from the Department or EPA Region 9 that the requirement for implementing the contingency measures is triggered.

#### **4.5.3.7 Test Methods**

Condition IV.C. of SPR No. 97168 requires that performance testing of the anode secondary hood baghouse shall be conducted as follows:

- The gas stream exiting the anode furnaces baghouse prior to mixing with other gas streams routed to the Main Stack.
- The gas stream exiting the acid plant at a location prior to mixing with other gas streams routed to the Main Stack.
- The gas stream exiting the secondary baghouse at a location prior to mixing with other gas streams routed to the Main Stack.
- The gas stream collected by the tertiary hooding at a location prior to mixing with other gas streams routed to the Main Stack.
- The gas stream exiting the vent gas baghouse at a location prior to mixing with other gas streams routed to the Main Stack.
- The gas stream exiting the anode secondary hood baghouse at a location prior to mixing with the other gas streams routed to the Main Stack.

In addition, the performance test shall test particulate matter using Method 5 and lead using Method 29.

To comply with Condition IV.C. of SPR No. 97168, the Permittee shall also evaluate opacity at the time of each performance test. The opacity evaluation shall evaluate both the opacity at the roofline monitor and note the opacity exiting from the walls or other openings but shall not include dust entrained from vehicles passing through an entryway. The opacity evaluation of the flash furnace building and anode aisle shall be conducted in accordance with 40 CFR 60.13 and the opacity evaluation of the converter aisle shall be conducted in accordance with 40 CFR 63.1450(c). If complying with 40 CFR Part 63, Subpart QQQ, then testing to demonstrate compliance with that standard shall satisfy this requirement for the converter aisle.

#### 4.5.3.8 Exemptions

SPR No. 97168 does not contain exemptions that are specific for lead.

## 4.6 Adequate Resources for Plan

Nonattainment plans are required include a description of the resources available to the State and local agencies at the date of submission of the plan and of any additional resources needed to carry out the plan during the five-year period following its submission. The description must include projections of the extent to which resources will be acquired.<sup>99</sup>

As the implementing agency, the cost to ADEQ of issuing permits and enforcement of ASARCO's Title V permit revision will be minimal. ADEQ's current full-time staff coordinated the development of the plan and permit revision with ASARCO and EPA; no additional resources were needed. ADEQ expects that the current staffing level in the Permits and Compliance Sections are adequate to implement and enforce the new measures.

Overall, ADEQ expects that the current resources available to the agency will be adequate to carry out this plan for the Hayden Pb NAA through the next five years.

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<sup>99</sup> See CAA section 110(a)(2)(E)(i); 40 CFR 51.280.

## 4.7 RACM/RACT Analysis

The following discussion includes review of the already implemented measures included in the 2017 SIP revision as well as new measures proposed for the 2023 revision. The 2017 measures and proposed new measures are identified in the following sections.

In conducting its RACM/RACT analysis, ADEQ referred to the following guidance documents issued by EPA:

- *Implementation of the 2008 Lead National Ambient Air Quality Standards Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions*, by Doug MacIntyre for U.S. EPA, March 2012.
- Appendix 1 – Available Fugitive Lead-Bearing Dust Control, State Implementation Plans for Lead Nonattainment Areas; Addendum to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 58 FR 67748, Dec. 22, 1993.

There are three factors that should be considered in determining whether a control measure is RACM, as established by EPA:<sup>100</sup>

- Economic feasibility
- Cost effectiveness
- Extent of adoption by other states

In the 2008 Pb NAAQS RACM guidance, EPA explicitly defined potential RACM, including RACT, for specific major point source categories of Pb emissions including secondary lead smelters, lead acid battery manufacturing, iron/still mills, and iron/steel foundries. RACM was not explicitly defined for the primary copper smelter source category in EPA's guidance. EPA suggests comparing RACM for a primary copper smelter to a similar source category in the guidance. Of the three source categories, ADEQ found that secondary lead smelters had the most similar processes and emissions points to those of primary copper smelters, and thus compared the control measures for ASARCO's Hayden Operations to RACM for the secondary lead smelter category.

The guidance also states that a particular control may constitute RACM if it was or will be adopted to comply with other federal regulations such as maximum achievable control technology (MACT) requirements under National Emissions Standards for Hazardous Air Pollutants (NEHSAPs). Since control measures in the Consent Decree are designed to bring the smelter into compliance with NESHAP requirements of 40 CFR Part 63, Subpart QQQ for primary copper smelters, these controls are required to meet prescribed MACT standards, and therefore also meet RACM requirements.

RACT applies to existing sources in an area emitting 0.5 tons per year or more, including stack emissions, process-related fugitive emissions, and lead-bearing fugitive dust.<sup>101</sup> The only source that meets this description is ASARCO's Hayden Operations. Therefore, ADEQ focused its RACM/RACT analysis on control measures applicable to ASARCO.

### ***Consent Decree Requirements for the 2017 SIP Revision***

The control measures incorporated into rules R18-2-B1301 and R18-2-B1301.01 were federally required by the Consent Decree or under NESHAPs. Traditionally, RACM/RACT analyses are conducted prior to

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<sup>100</sup> See Implementation of the 2008 Lead National Ambient Air Quality Standards Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions, U.S. EPA. (March 2012).

<sup>101</sup> See 73 FR 66964, 67037 (12 Nov. 2008).

modeling and rule development. However, ADEQ wanted to maximize the use of the controls being implemented under the Consent Decree for meeting SIP requirements. In December 2015, the Consent Decree was finalized, and ADEQ began modeling efforts to determine whether controls from the Consent Decree that regulated Pb emissions would attain the 2008 Pb NAAQS. ADEQ developed an inventory of Pb emissions in the NAA, then modeled the prescribed controls from the Consent Decree on those sources. The model demonstrated attainment with the Consent Decree controls.<sup>102</sup> Soon after, the controls were incorporated into two rules applicable to the Hayden copper smelter.<sup>103</sup>

The implementation schedule for the 2017 SIP controls included:

- Permanently cease operation of the five existing converters and complete installation of two of three new, high-efficiency converters no later than May 1, 2018
- Replace the existing R&R Cottrell ESP with a new vent gas baghouse for the dryers and flash furnace no later than May 1, 2018
- Complete the CRP<sup>104</sup> no later than December 1, 2018
- Start the first study on fugitives from the smelting process no later than six months after the completion of the CRP (at maximum, by June 1, 2019). A study protocol must be submitted six months prior to the study's commencement (at maximum, by December 1, 2018).
- Submit a Fugitive Dust Plan within 180 days of the Consent Decree's effective date (at maximum, by May 2016)
- Implement Fugitive Dust Plan controls roughly between 120-180 days of EPA's approval of Plan

Because the Consent Decree related controls were tied to attainment, the implementation schedule for those controls in the Hayden Pb NAA was based on the schedule required by the Consent Decree.

A RACM/RACT analysis traditionally also includes an analysis on the cost effectiveness of the controls. Because the control measures in the 2017 SIP were independently required under the Consent Decree or NESHAPs, ADEQ did not conduct a traditional cost analysis.<sup>105</sup> For context, ASARCO spent approximately \$150 million to install the new control technology under the Consent Decree. The cost of the Converter Retrofit Project alone is estimated to be about \$110 million.

### ***Proposed New Measures for the 2023 SIP Revision***

Following EPA's finding that the Hayden Pb planning area failed to attain the standards by the October 3, 2019 attainment date, ADEQ was required to develop a new plan for the nonattainment area that includes any new measures determined necessary to demonstrate attainment of the Pb NAAQS by January 31, 2027.

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<sup>102</sup> See "*SIP Revision: Hayden Lead Nonattainment Area, March 2, 2017 FINAL.*"

<sup>103</sup> Refer to section 4.4.2 of this chapter for more detailed information on the Consent Decree controls incorporated into rule.

<sup>104</sup> See Section 4.4.1 for a description of the CRP.

<sup>105</sup> In developing its RACM/RACT analysis, ADEQ referred to the South Coast Air Quality Management District's (SCAQMD) analysis of its rule 1420.1, which controls Pb emissions from lead-acid battery recycling facilities. Because a lead-acid battery recycling facility applicable to 1420.1 (Exide Technologies) was also under a similar settlement agreement as ASARCO, SCAQMD also excluded the controls required by the settlement from its RACM cost analysis. EPA approved SCAQMD's rule and RACM analysis in 2014 (79 FR 13875). For SCAQMD's socioeconomic report on rule 1420.1, see *Draft Socioeconomic Assessment for Proposed Rule 1420.1—Emissions Standard for Lead from Large Lead-Acid Battery Recycling Facilities*, South Coast Air Quality Management District, August 2010, available here: <http://www.aqmd.gov/home/library/clean-air-plans/lead-state-implementation-plan>.

On December 16, 2022 ASARCO submitted a petition for a state implementation plan (SIP) revision for the Hayden Pb nonattainment area and an application for a significant revision of the Class I air quality control permit for the Hayden smelter. The petition and application proposed additional emissions capture, control and related requirements, focused on 1) the Uptake Improvement Project, 2) Fuming Ladle Control Project, and 3) the Anode Furnaces Secondary Hood Project (see descriptions of the proposed measures in Section 4.5).

As noted above, EPA's 2012 RACM guidance does not directly address primary copper smelting. It does, however, address similar processes at secondary lead smelting facilities. Section 4.4.5 of the guidance concludes that partial or total enclosure of fugitive process sources from "refining kettles" is an appropriate RACM control. Subsequent to controls implemented under the 2017 Hayden Pb SIP, ASARCO has implemented the equivalent of "full or partial enclosure" for all primary process sources of emissions at the Hayden facility. The enclosures are directed to either the Wet Gas Handling System or one of the baghouses. The three projects contemplated in this SIP revision further enhance these controls. The Uptake Improvement Project routes emissions from the flash furnace, matte tapping and slag skimming areas not captured by the primary system to the Converter Secondary Hood Baghouse. The Fuming Ladle Control Project routes emissions from fuming ladles, currently lost to the converter tertiary ventilation system or to the atmosphere through the material transfer area or anode aisle roof monitors to the Converter Secondary Hood Baghouse. The Anode Secondary Hood Project routes emissions from the anode furnaces that are not captured by the anode primary hoods to a new Anode Secondary Hood Baghouse. The resulting multi-layer capture and control system meets or exceeds RACM requirements set forth in the 2012 Lead RACM Guidance.

The following sections present ADEQ's RACM/RACT analysis for control measures included in the 2017 and 2023 SIP revisions.

#### 4.7.1 Rule R18-2-B1301 and Significant Permit Revision 97168 Demonstration of RACM/RACT

In the RACM/RACT demonstration for smelting process controls contained in A.A.C. R18-2-B1301 and Permit Revision 97168, ADEQ referenced EPA's RACM guidance for the 2008 Pb NAAQS, in particular, the RACM/RACT detailed for the secondary lead smelter source category. In the guidance, NESHAP requirements are referred to as meeting RACM, considering requirements under NESHAPs are MACT-level of control. Therefore, ADEQ has compared the rule and permit controls to NESHAP requirements for secondary lead smelters to follow EPA guidance. But because the Hayden smelter is actually a primary copper smelter, and thus must comply with NESHAPs for the primary copper smelting source category, ADEQ also compared the rule to NESHAPs for primary copper smelters.

##### 4.7.1.1 Comparison to Primary Copper Smelting NESHAPs

EPA promulgated emission standards and compliance requirements for primary copper smelters under NESHAPs.<sup>106</sup> Primary copper smelters that emit any single HAP at the rate of 10 tons or more per year or any combination of HAPs at a rate of 25 tons or more per year must comply with NESHAPs for major sources. The NESHAP requirements represent MACT under CAA Section 112. MACT requirements apply

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<sup>106</sup> See 67 FR 40478 (June 12, 2002); codified at 40 CFR 63.1440.

nationwide, regardless of whether an area attains the Pb NAAQS, so EPA expects MACT requirements are also needed in order to fulfill RACM/RACT requirements.<sup>107</sup>

As stated previously, ASARCO, the owner and operator of the primary copper smelter in the Hayden NAA, entered a Consent Decree with EPA over NESHAP requirements under 40 CFR Part 63, Subpart QQQ. Therefore, in its RACM/RACT analysis, ADEQ compared the rules to NESHAP requirements for primary copper smelters.

A summary of NESHAP-related MACT requirements for primary copper smelters and how they are addressed in rule R18-2-B1301 and significant permit revision 97168 is provided below.

**During all times when copper matte or slag is tapped or skimmed from a smelting furnace, a capture system must collect off-gases released from the tapping/skimming port in use. The design and placement of this capture system must be such that the tapping port opening, launder, and receiving vessel (e.g., ladle, slag pot) are positioned within the confines or influence of the capture system's ventilation draft during those times when the copper matte or slag is flowing from the tapping port opening.**

**2017 SIP Controls.** A ventilation system for the flash furnace's tapping port is required to be positioned as described by the Consent Decree, as well as under NESHAPs. This ventilation system is addressed in ASARCO's O&M plan, which is required under R18-2-B1301. Under the rule, the O&M plan must include air flows and other parameters to ensure the capture system is operating properly to control emissions. A fugitive emissions study conducted in accordance with Appendix 14 will verify operational parameters to ensure fugitive Pb emissions from the smelting process are consistent with those modeled in the attainment demonstration.

**2023 SIP Controls.** The Uptake Improvement Project requires the installation and ventilation of a partial enclosure around the INCO flash furnace uptake shaft to improve capture of any fugitives from the flash furnace and emissions generated during matte tapping and slag skimming activities. These emissions are ducted to the converter secondary hood baghouse, treated, and released to the annulus of the main stack. The uptake enclosure will be ventilated except during brief periods when slag is returned to the flash furnace.

**MACT requires a capture system for each existing copper converter. For Pierce-Smith converters (as is the case for the Hayden smelter), a capture system design must include a primary hood and additional hooding (e.g. secondary hoods) to properly control emissions.**

**2017 SIP Controls.** As part of the Consent Decree, ASARCO installed updated primary and secondary hooding over the converter aisle, in addition to new tertiary hooding, which is addressed in the O&M plan required by R18-2-B1301.

**2023 SIP Controls.** The Fuming Ladle Control Project requires the construction of a hood and retaining walls to capture "fuming" ladle emissions (which sometimes occur after a ladle is poured) from the converter aisle and material transfer area that is located between the converter aisle and the anode furnaces. The hood will be ducted to the converter secondary hood baghouse, where the additionally

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<sup>107</sup> See Technical Support Document for EPA's Proposed Rulemaking for the California State Implementation Plan, South Coast Air Quality Management District, Rule 1420.1, Emission Standards for Lead from Large Lead-Acid Battery Recycling Facilities, prepared by Adrienne Borgia and reviewed by Andrew Steckel, U.S. EPA. (June 2012) Retrieved: <http://www.regulations.gov/>.

captured emissions will be treated to remove particulate matter including lead and then released to the main stack annulus.

**MACT requires that all copper smelting processes and related control equipment must be operated in a manner consistent with good air pollution control practices for minimizing emissions. All processes and controls must be operated in accordance with an operation and maintenance plan that addresses preventative maintenance, capture system inspections, and operating limits.**

The Hayden smelter rule [R18-2-B1301(D)] requires that ASARCO operates smelting processes and control equipment in a manner consistent with good air pollution practices. ASARCO must also submit an O&M plan that must be reviewed by ADEQ [R18-2-B1301(D)(2)]. The plan must address monitoring devices for control devices, operational limits, preventative maintenance, and inspections. The rule prescribes the minimum operational parameters that will be used as representative and reliable indicators of the capture system or control device operation, which will ensure the adequate control of smelting-process fugitive emissions. Such operational parameters are consistent with NESHAPs, and include volumetric flow rates, damper position settings, and blowing hours.

Condition IV.B (Operational Limits) of SPR No. 97168 indicates that minimum specifications for system operation are set forth in Condition II of the permit. These shall be incorporated into the O&M Plan required by R18-2-B1301(D)(2). Revisions to the plan shall be submitted for approval within 180 days of the effective date of Permit Condition IV under Condition I.C.

**MACT requires an initial performance test to demonstrate compliance with particulate matter emission and opacity limits. Performance tests can be conducted using a variety of EPA reference methods, including Reference Method 29. Thereafter, continuous compliance is demonstrated through annual performance tests.**

To comply with the main stack emission limit in R18-2-B1301(C), ASARCO must conduct initial performance tests on five gas streams routed to the main stack no later than 180 days after the completion of all CRP-related improvements. Thereafter, performance tests must occur annually. The rule mandates that all performance tests must be conducted in accordance with Method 29, *Determination of Metals Emissions from Stationary Sources*.

Condition IV.C from Attachment "I" of SPR No. 97168 provides testing requirements for the anode secondary hood baghouse. These requirements shall be conducted on six gas streams routed to the Main Stack. These performance tests shall use Method 5 for particulate matter and Method 29 for lead. The Permittee shall also evaluate opacity at the time of each performance test. The opacity evaluation shall evaluate both the opacity at the roofline monitor and note the opacity exiting from the walls or other openings but shall not include dust entrained from vehicles passing through an entryway. The opacity evaluation of the flash furnace building and anode aisle shall be conducted in accordance with 40 CFR 60.13 and the opacity evaluation of the converter aisle shall be conducted in accordance with 40 CFR 63.1450(c). If complying with 40 CFR Part 63, Subpart QQQ, then testing to demonstrate compliance with that standard shall satisfy this requirement for the converter aisle.

**MACT requires appropriate monitoring devices for capture systems and control devices used to measure accurate parameters of operating limits and to demonstrate continuous compliance with operating limits.**

The Hayden smelter rule, R18-2-B1301, requires monitoring devices to be addressed in the O&M plan for control devices and capture systems, in addition to setting operational limits for each system or device.

Additional monitoring requirements are contained in SPR No. 97168, located in Permit Condition IV.D, Attachment “I”. These requirements include the parameters for the proposed capture systems and control devices included in the 2023 control strategy presented in this SIP.

**MACT requires semiannual compliance reports. MACT also requires that records must be maintained at least for five years and kept on site for at least two years.**

R18-2-B1301 requires ASARCO to submit semiannual progress reports of construction for any CRP-related improvement. ASARCO must also submit reports of the performance testing conducted to comply with the main stack emission limit, in addition to calculations for emission limit compliance. The rule requires records to be kept onsite for two years and retained for at least five.

In SPR No. 97168, Permit condition IV.F (recordkeeping requirements) and condition IV.G (reporting requirements) contain provisions for the type, details, and timing of records and reports.

Based on the above comparison to control measures prescribed by NESHAPs for primary copper smelters, the control measures required by R18-2-B1301 and SPR No. 97168 applicable to ASARCO’s Hayden Operations meets RACM/RACT requirements.

#### 4.7.1.2 Comparison to Secondary Lead Smelting NESHAPs and EPA Guidance

A summary of the minimum elements required for secondary lead smelters by EPA guidance and NESHAPs, and how they are fulfilled by requirements in R18-2-B1301 is provided below. It is important to note that these rules mirror control measures that are independently required by the Consent Decree.

**MACT for an existing source must maintain 1.0 milligrams of lead per dry standard cubic meter in any process vent gas and 0.20 milligrams of lead per dry cubic meter from a secondary lead smelting facility on a rolling 12-month average basis.**

While NESHAPs for *secondary lead smelters* requires a Pb emission limit, NESHAPs for *primary copper smelters* does not. To comply with this regulation, R18-2-B1301 requires an emission limit for the main stack that is protective of the 2008 Pb NAAQS and demonstrates attainment for the area (see the Modeling TSD in Appendix B).

**Initial performance tests and annual compliance tests are required unless a continuous emissions monitoring system (CEMS) is installed. Method 29 is an available test method.**

R18-2-B1301 requires initial performance tests on the emission points that are routed to the main stack no later than 180 days after completion of the CRP. Thereafter, annual tests are required. Tests must be conducted in accordance with Method 29.

Under SPR No. 97168, Permit condition IV.C (Testing Requirements) in Attachment “I” provides testing requirements for the anode secondary hood baghouse. These requirements shall be conducted on six gas streams routed to the Main Stack. These performance tests shall use Method 5 for particulate matter and Method 29 for lead. The Permittee shall also evaluate opacity at the time of each performance test. The opacity evaluation shall evaluate both the opacity at the roofline monitor and note the opacity exiting from the walls or other openings but shall not include dust entrained from vehicles passing through an entryway. The opacity evaluation of the flash furnace building and anode aisle shall be conducted in accordance with 40 CFR 60.13 and the opacity evaluation of the converter aisle shall be conducted in accordance with 40 CFR 63.1450(c). If complying with 40 CFR Part 63, Subpart QQQ, then testing to demonstrate compliance with that standard shall satisfy this requirement for the converter aisle.

**Fabric filters controlling uncontrolled lead process emissions from stacks:<sup>108</sup>**

EPA gave fabric filters, or baghouses, a RACM rating of 3 for secondary lead smelters.<sup>109</sup> Fabric filters are commonly used on secondary lead smelters, which suggests they are one of the most economically feasible control technologies. Available data shows fabric filters are also a cost-effective way to control Pb emissions, costing on average roughly \$400/ton.

Rule R18-2-B1301 requires ASARCO to maintain control equipment to minimize Pb emissions in accordance with an O&M plan. Such equipment will include a vent gas baghouse to capture emissions from the concentrate dryers and flash furnace, a baghouse for the secondary hooding over the converters, and a baghouse for the anode furnaces.

**Partial and total enclosures to control fugitive process lead emissions:**

EPA gave partial enclosure hoods for smelter process units a RACM rating of 3. All secondary lead smelters use partial (or total) enclosure hooding systems to control fugitive emissions from the smelting process. The enclosure hooding systems ventilate emissions to control devices such as baghouses.

Under R18-2-B1301, ASARCO must operate control devices that minimize Pb emissions in accordance with an O&M plan. This control equipment includes CRP-related improvements to the primary and secondary hooding systems over each converter, as well as a new tertiary hooding system over the converter aisle. Emissions from the secondary hooding are ventilated to a baghouse when the converter is not blowing and routed to the acid plant when the converter is blowing. The tertiary hooding system captures converter aisle emissions not collected by the primary and secondary hooding and route them to the main stack instead of allowing them to escape into the atmosphere as process fugitive emissions. Hooding and enclosure systems were improved on matte and slag tap ports. These hooding improvements and the addition of the tertiary hooding is also required by the Consent Decree.

Under Significant Permit Revision No. 97168, ASARCO must install a partial enclosure around the INCO flash furnace uptake shaft to improve capture of any fugitive emissions from the flash furnace and emissions generated during matte tapping and slag skimming activities (reducing “blow-through” emissions from the flash furnace to the converter aisle). These emissions are ducted to the converter secondary hood baghouse, treated, and released to the annulus of the main stack.

The permit also requires the construction of a hood and retaining walls to capture “fuming” ladle emissions from the converter aisle and material transfer area that is located between the converter aisle and the anode furnaces. The hood will be ducted to the converter secondary hood baghouse, where the additionally captured emissions will be treated to remove particulate matter including lead and then released to the main stack annulus.

Permit requirements also include the construction of secondary hoods, similar to those found on the converters, around the anode furnaces, allowing improved capture during operations. The hoods will be ducted to a new anode secondary hood baghouse, where the additionally captured emissions will be treated to remove particulate matter including lead and then released to the main stack annulus.

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<sup>108</sup> For more information on these RACM and EPA’s analysis, see *Implementation of the 2008 Lead National Ambient Air Quality Standards Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions* issued in March 2012 by U.S. EPA, more specifically at section 4.0 on page 16.

<sup>109</sup> In EPA’s RACM guidance for the 2008 Pb NAAQS, certain RACM were rated based on EPA’s criteria and given a rating of 1, 2, or 3, with a score of 3 demonstrating a high likelihood of the control measure constituting RACM.

**MACT requires records kept on site for two years and maintained for five years.**

The Hayden smelter rule, R18-2-B1301(G), requires records to be kept onsite for at least two years and retained for at least five years. Permit Condition IV.F in Attachment “I” of SPR No. 97168 contains the same requirements for records to be kept on-site for at least two years and retained for at least five years.

Based on the above comparison to control measures prescribed by EPA and NESHAPs for secondary lead smelters, the control measures required by R18-2-B1301 and SPR No. 97168 applicable to ASARCO’s Hayden Operations meet RACM/RACT requirements.

#### 4.7.2 Rule R18-2-B1301.01 Demonstration of RACM/RACT

In determining whether the fugitive dust requirements in the Consent Decree, also required by rule R18-2-B1301.01, constitute RACM/RACT, ADEQ referred to the General Preamble of the CAA Amendments, other states’ PM<sub>10</sub> rules, South Coast Air Quality Management District’s rule for Pb emissions from lead-acid battery recycling facilities, as well as federal NESHAP requirements.

It was found that the dust controls from the Consent Decree and in R18-2-B1301.01 are very similar to those found in the General Preamble, non-leaded PM<sub>10</sub> rules, and NESHAPs for primary copper smelters.

##### 4.7.2.1 Comparison to NESHAPs & Evaluation

ASARCO installed its fugitive dust controls to comply with federal NESHAPs for the primary copper smelter source category, which is a MACT level of control. The requirements in R18-2-B1301.01 mirror what’s required under the Consent Decree and NESHAPs. For this comparison, ADEQ drew on EPA’s RACM guidance document for the 2008 Pb NAAQS and NESHAP requirements for two source categories: Primary Copper Smelters and Secondary Lead Smelters. Generally, R18-2-B1301.01 requirements are consistent with either NESHAPs for copper smelters or NESHAPs for lead smelters, or sometimes both. And because EPA’s RACM guidance draws on NESHAP requirements for secondary lead smelters, R18-2-B1301.01 follows EPA’s guidance as well.

This comparison, along with ADEQ’s evaluation of R18-2-B1301.01, is in Table 4-5 below.

Table 4-5 Comparison &amp; Evaluation of Pb Dust Rule to EPA Guidance &amp; NESHAPs

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2008 Pb NAAQS RACM Guidance for <i>Secondary Lead Smelter Source Category &amp; Fug. Dust</i> | NESHAPs for <i>Primary Copper Smelters (40 CFR Part 63, Subpart QQQ) *MACT</i> | NESHAPs for <i>Secondary Lead Smelters (40 CFR Part 63, Subpart X) *MACT</i>                                                                                                                                                                   | R18-2-B1301.01 Evaluation                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (SELECTED) DEFINITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                               |                                                                                |                                                                                                                                                                                                                                                |                                                                                                                                                                                                  |
| "High wind event" means any period of time beginning when the average wind speed, as measured at a meteorological station maintained by the owner or operator that is approved by the Department, is greater than or equal to 15 miles per hour over a 15 minute period, and ending when the average wind speed, as measured at the approved meteorological station maintained by the owner or operator, falls below 15 miles per hour over a 15 minute period." | n/a                                                                                           | n/a                                                                            | n/a                                                                                                                                                                                                                                            | Considering neither NESHAPs nor guidance address high wind events, this fugitive Pb dust rule requirement is considered RACM.                                                                    |
| "Lead-bearing fugitive dust" means uncaptured and/or uncontrolled particulate matter containing lead that is entrained in the ambient air and is caused by activities, including, but not limited to, the movement of soil, vehicles, equipment, and wind.                                                                                                                                                                                                       | n/a                                                                                           | n/a                                                                            | n/a                                                                                                                                                                                                                                            | NESHAPs nor guidance address this type of definition; however, it is consistent with the similar definition in South Coast's Pb rule (see Table 4-8).                                            |
| "Material pile" means material, including concentrate, uncrushed reverts, crushed reverts, and bedding material, that is stored in a pile outside a building or warehouse and is capable of producing lead-bearing fugitive dust.                                                                                                                                                                                                                                | n/a                                                                                           | n/a                                                                            | n/a                                                                                                                                                                                                                                            | Although NESHAPs and guidance do not address this type of definition, the fugitive Pb dust rule is consistent with similar definitions in other non-lead PM <sub>10</sub> rules (see Table 4-7). |
| "Non-smelting process sources" means sources of lead-bearing fugitive dust that are not part of the hot metal process, which includes smelting in the INCO flash furnace, converting, and anode refining and casting. Non-smelting process sources include storage, handling, and unloading of concentrate, uncrushed reverts, crushed reverts, and bedding material; acid plant scrubber blowdown solids; and paved and unpaved roads.                          | n/a                                                                                           | n/a                                                                            | "Fugitive dust source" means a stationary source of hazardous air pollutant emissions at a secondary lead smelter that is not associated with a specific process or process fugitive vent or stack. Fugitive dust sources include, but are not | Meets RACM. The definition used for secondary lead smelter's is generally consistent with the Hayden Pb dust rule definition.                                                                    |

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                | 2008 Pb NAAQS RACM Guidance for Secondary Lead Smelter Source Category & Fug. Dust | NESHAPs for Primary Copper Smelters (40 CFR Part 63, Subpart QQQ) *MACT | NESHAPs for Secondary Lead Smelters (40 CFR Part 63, Subpart X) *MACT                                                                                                                                                                                                                                                                                                                                                                                                 | R18-2-B1301.01 Evaluation                                                                                                                                                                  |
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|                                                                                                                                                                                                                                                                                                                                                           |                                                                                    |                                                                         | limited to, roadways, storage piles, lead bearing material handling transfer points, lead bearing material transport areas, lead bearing material storage areas, other lead bearing material process areas, and buildings. (See § 63.542).                                                                                                                                                                                                                            |                                                                                                                                                                                            |
| “Storage and handling” means all activities associated with the handling and storage of materials that take place at the Hayden Smelter, including, but not limited to, stockpiling, transport on conveyor belts, transport or storage in rail cars, crushing and milling, arrival and handling of offsite concentrate, bedding, and handling of reverts. | n/a                                                                                | n/a                                                                     | "Materials storage and handling area" means any area of a secondary lead smelter in which lead-bearing materials (including, but not limited to, broken battery components, reverberatory furnace slag, flue dust, and dross) are stored or handled between process steps including, but not limited to, areas in which materials are stored in open piles, bins, or tubs, and areas in which material is prepared for charging to a smelting furnace. (See § 63.542) | Meets RACM. The definition used for secondary lead smelter's is generally consistent with the Hayden Pb dust rule definition.                                                              |
| “Trackout/carry-out” means any materials that adhere to and agglomerate on the surfaces of motor vehicles, haul trucks, and/or equipment (including tires) and that may then fall onto the road.                                                                                                                                                          | n/a                                                                                | n/a                                                                     | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Although NESHAPs and guidance do not address such definition, the fugitive Pb dust rule is consistent with similar definitions in other non-leaded PM <sub>10</sub> rules (see Table 4-7). |

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                                                                                    | 2008 Pb NAAQS RACM Guidance<br>for Secondary Lead Smelter<br>Source Category & Fug. Dust                                                         | NESHAPs for Primary Copper<br>Smelters (40 CFR Part 63, Subpart<br>QQQ) *MACT                                                                                                                                                                                                                                                                                    | NESHAPs for Secondary Lead<br>Smelters (40 CFR Part 63, Subpart<br>X) *MACT                                                                                                                                                                                                                                                                                                                                      | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FUGITIVE DUST PLAN &amp; COMPLIANCE</b>                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                |
| Development, implement, and follow a fugitive dust plan that addresses sources of fugitive Pb dust.<br><br>Compliance with the rule is demonstrated through full implementation of the fugitive dust plan, in addition to the housekeeping requirements (which are the same requirements that will go into the fugitive dust plan, but they are also required independently by the rule regardless of a plan to ensure control of emissions). | While NESHAPs for secondary lead smelters and primary copper smelters require a dust plan, such requirement was not discussed in EPA's guidance. | Must operate according to a "written fugitive dust control plan" which must address sources like outdoor piles, bedding areas, conveyor transfer points, and roadways. (See § 63.1445).<br><br>Compliance is demonstrated through implementing all of the fugitive control measures specified for the source in the fugitive dust control plan. (See § 63.1453). | Must prepare and at all times operate according to a "standard operation procedures" manual that describes in detail the measures to control the fugitive dust emissions from sources listed, which include roadways, storage areas, handling areas, etc. (See § 63.545).<br><br>Compliance is demonstrated through operating at all times according to the standard operating procedures manual (see § 63.545). | Meets RACM. Requiring a dust plan is consistent with NESHAPs for both source categories, primary copper smelters and secondary lead smelters (although secondary lead smelter uses a "standard operation procedures manual").<br><br>Compliance methods are also consistent with both NESHAPs. |
| <b>PAVED ROADS</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                |
| Facility-wide, overall 20 percent opacity limit for all fugitive lead dust sources, including paved roads.                                                                                                                                                                                                                                                                                                                                    | n/a                                                                                                                                              | n/a                                                                                                                                                                                                                                                                                                                                                              | n/a                                                                                                                                                                                                                                                                                                                                                                                                              | Considering guidance nor NESHAPs address an opacity limit, this fugitive Pb dust rule requirement is considered RACM for being consistent with opacity limits in other non-lead PM <sub>10</sub> rules (see Table 4-7).                                                                        |

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                        | 2008 Pb NAAQS RACM Guidance for Secondary Lead Smelter Source Category & Fug. Dust                                                                                                                                                                                                                        | NESHAPs for Primary Copper Smelters (40 CFR Part 63, Subpart QQ) *MACT                                                                                                                                                    | NESHAPs for Secondary Lead Smelters (40 CFR Part 63, Subpart X) *MACT                                                                                                                  | R18-2-B1301.01 Evaluation                                                                                                                                                                                                            |
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| <p>Section (D)(9) of the rule requires roads to be cleaned at least once daily with a sweeper, vacuum, or wet broom in accordance with manufacturer recommendations.</p> <p>EPA published a finding of failure to attain on January 31, 2022 [87 FR 4805] which triggered contingency measure requirements under rule section (E) to increase road cleaning to twice per day.</p> | <p>EPA's guidance matches the requirements for NESHAPs for Secondary Lead Smelters, which requires paved roads to be cleaned twice per day (see guidance, page 23). However, no requirement similar to this is required under NESHAPs for ASARCO's source category, which is primary copper smelters.</p> | <p>NESHAPs for primary copper smelters has no specific requirement for cleaning paved roads.</p>                                                                                                                          | <p>NESHAPs for secondary lead smelters requires paving all areas subject to vehicle traffic and must clean the pavement twice per day (see § 63.545).</p>                              | <p>Meets RACM. The Hayden rule incorporates a paved road cleaning frequency of twice per day. There are no paved road cleaning requirements under NESHAPs for primary copper smelters, only for secondary lead smelters.</p>         |
| <p>Rapidly clean up track-out and carry out on paved roads that extends a cumulative distance of 50 linear feet or more; clean all other trackout and carry out at the end of the workday.</p>                                                                                                                                                                                    | <p>No specific requirement resembling trackout and carryout clean-up, but guidance does list timely cleaning of accidental releases as a RACM measure (see page 25).</p>                                                                                                                                  | <p>No specific requirement, however, trackout and carryout could be addressed via a facility's "fugitive dust control plan" (see § 63.1445).</p>                                                                          | <p>No specific requirement, however, trackout and carryout could be addressed via a facility's "standard operating procedures manual" (see § 63.545).</p>                              | <p>Meets RACM. In addition to mirroring general PM<sub>10</sub> rule requirements in other states (see Table 4-7) the Hayden rule goes beyond NESHAP requirements by specifying clean-up frequencies for trackout and carry-out.</p> |
| <p>Speed limit of 15 mph with signs posted.</p>                                                                                                                                                                                                                                                                                                                                   | <p>No requirement.</p>                                                                                                                                                                                                                                                                                    | <p>No requirement.</p>                                                                                                                                                                                                    | <p>No requirement.</p>                                                                                                                                                                 | <p>Meets RACM. While guidance and NESHAPs do not require specific speed limits for paved roads, the Hayden rule is generally consistent with other states' PM<sub>10</sub> rules (see Table 4-7).</p>                                |
| UNPAVED ROADS                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                           |                                                                                                                                                                                        |                                                                                                                                                                                                                                      |
| <p>Facility-wide, overall 20 percent opacity limit for all fugitive lead dust sources, including unpaved roads.</p> <p>Chemical dust suppression application for high-leaded unpaved roads, including slag hauler road, secondary crusher road, and reverts crushing operations roads.</p>                                                                                        | <p>While EPA's guidance recognizes that there is no known adoption of chemical dust suppression for source categories addressed in the guidance, which are secondary lead smelting, lead</p>                                                                                                              | <p>The controls in the fugitive dust plan must address such sources as roadways used by trucks for transporting bulk materials (which would include unpaved roads). Available controls listed in NESHAPs include dust</p> | <p>There are no requirements applicable to unpaved roads for secondary lead smelters. This is due to the fact that all roads subject to vehicle traffic must be paved or otherwise</p> | <p>Meets RACM. Generally, EPA cited paving unpaved roads as a known control measure for source categories like secondary lead smelters, which conforms to the NESHAP requirements for that source category.</p>                      |

| R18-2-B1301.01 Requirement                                                                                                                                                       | 2008 Pb NAAQS RACM Guidance<br>for Secondary Lead Smelter<br>Source Category & Fug. Dust                                                                                                                                                                                                                           | NESHAPs for Primary Copper<br>Smelters (40 CFR Part 63, Subpart<br>QQQ) *MACT                                                                                                                                                                                                                                                                             | NESHAPs for Secondary Lead<br>Smelters (40 CFR Part 63, Subpart<br>X) *MACT                                                                                                                                                                                                                                                                                          | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Soil stabilization requirements for unpaved roads, which are a 20 percent opacity limit, silt loading limit of 0.33 oz/ft2, and silt content limit of 6 percent.                 | acid battery manufacturing, and iron and steel foundries, this Hayden Pb dust rule requirement is consistent with NESHAP requirements for primary copper smelters.<br><br>(Note: Other R18-2-B1301.01 requirements listed here were not addressed in EPA's guidance and are therefore not compared in this table.) | suppression agents (see § 63.1445).<br><br>(Note: Other R18-2-B1301.01 requirements listed here are generally not mentioned in NESHAPs, and are therefore not compared in this table).                                                                                                                                                                    | encapsulated (see § 63.545(c)(2)).<br><br>(Note: Other R18-2-B1301.01 requirements listed here are generally not mentioned in NESHAPs, and are therefore not compared in this table).                                                                                                                                                                                | However, given that the ASARCO smelter is a primary copper smelter, not a secondary lead smelter, the Hayden Pb dust rule stays consistent with NESHAP requirements for the primary copper smelter source category and thus requires chemical dust suppressants to be used on unpaved roads.<br><br>Chemical dust suppressants are also known BACM for other serious PM <sub>10</sub> nonattainment areas in the Southwest (see Table 4-7). |
| Maintain back-up watering trucks and personnel for visible emissions control.                                                                                                    |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Immediate, but no later than 30 minutes after observation, application of water or chemical dust suppressant where visible emissions are observed.                               |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Reapplication of chemical dust suppressants within 24 hours of discovery of breakdown.                                                                                           |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Collection and prevention of runoff and/or sweeping material                                                                                                                     |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Speed limit of 15 mph with posted signs.                                                                                                                                         |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| MATERIAL STORAGE PILES & MATERIAL HANDLING                                                                                                                                       |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Facility-wide, overall 20 percent opacity limit for all fugitive lead dust sources, including storage piles.                                                                     | EPA's guidance lists partial enclosures with wet suppression as available controls for storage areas and storage piles.<br><br>(Note: Other R18-2-B1301.01 requirements listed here were not addressed in EPA's guidance and are therefore not compared in this table.)                                            | The controls in the fugitive dust plan must address sources like material piles and conveying system transfer points. Controls listed include wind screens/fences and spraying water. (See § 63.1445).<br><br>(Note: Other R18-2-B1301.01 requirements listed here are generally not mentioned in NESHAPs, and are therefore not compared in this table). | Vehicles must be washed at each exit of material storage and handling areas. Material transport must be conducted within closed conveyor systems or in sealed, leak-proof containers unless activities are contained in a total enclosure. All other lead-bearing material must be contained and covered for transport outside of a total enclosure in a manner that | Meets RACM. The Hayden Pb dust rule combines requirements from both EPA's guidance, NESHAPs for primary copper smelters, and NESHAPs for secondary lead smelters.<br><br>Like EPA's guidance and NESHAPs for primary copper smelters, the Hayden Pb dust rule requires water sprays and wind fences to be used for material storage piles. Also, material conveyor systems must have minimized                                              |
| Material conveyor systems drop heights must be minimized to the greatest extent practicable and any spillage must be cleaned within 30 minutes of discovery.                     |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Storage of concentrate and crushed reverts must be on concrete pads.                                                                                                             |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Water sprays for storage piles, requiring a 10 percent surface moisture content, as determined by ASTM method D2216-10, for concentrate, crushed reverts, and bedding materials. |                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| R18-2-B1301.01 Requirement                                                                                                                               | 2008 Pb NAAQS RACM Guidance<br>for Secondary Lead Smelter<br>Source Category & Fug. Dust | NESHAPs for Primary Copper<br>Smelters (40 CFR Part 63, Subpart<br>QQQ) *MACT | NESHAPs for Secondary Lead<br>Smelters (40 CFR Part 63, Subpart<br>X) *MACT                                                                                                                                    | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                      |
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| Wind fences for storage piles, with material pile height not to exceed wind fence height, and the wind fence must have a porosity of 50 percent or less. |                                                                                          |                                                                               | prevents spillage or dust formation. Material handling areas and other sources of dust must be operated in a total enclosure maintained under negative pressure. (See § 63.545(c)(5) and (c)(7) and § 63.544). | drop heights to lessen fugitive dust emissions.                                                                                                                                                                                                |
| Materials being transported by vehicle must be covered by a tarp and the cargo compartment must be free of holes or other openings.                      |                                                                                          |                                                                               |                                                                                                                                                                                                                | In addition, while NESHAPs for secondary lead smelters require vehicle washings, the Hayden Pb dust rule requires rumble grates at the bedding plant, which is a similar measure used to control dust at a material storage and handling area. |
| Water suppression or handling postponement during high wind events.                                                                                      |                                                                                          |                                                                               |                                                                                                                                                                                                                |                                                                                                                                                                                                                                                |
| Maintain rumble grates at all of the bedding plant area's entrances and exits for control of dust from loader tires.                                     |                                                                                          |                                                                               | (Note: Other R18-2-B1301.01 requirements listed here are generally not mentioned in NESHAPs, and are therefore not compared in this table).                                                                    |                                                                                                                                                                                                                                                |

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2008 Pb NAAQS RACM Guidance<br>for Secondary Lead Smelter<br>Source Category & Fug. Dust                                                                                                                                                                                                       | NESHAPs for Primary Copper<br>Smelters (40 CFR Part 63, Subpart<br>QQQ) *MACT                                                                                                                                 | NESHAPs for Secondary Lead<br>Smelters (40 CFR Part 63, Subpart<br>X) *MACT                                                                                                                                             | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Dry acid plant scrubber blowdown solids only in an enclosed system that uses a venturi scrubber, thickener, filter press, and electric dryer that is maintained under negative pressure. The negative pressure of the electric dryer enclosure is maintained using a 2,500 ACFM dryer ventilation fan to be used at all times the electric dryer is operational. Monitoring of the negative pressure is demonstrated through the run and stop states of ventilation fan and electric dryer. | EPA's guidance listed partial/total enclosures in combination with negative pressure for storage areas/process units as RACM due to its widespread use at secondary lead smelters (11 of 14 smelters) and adoption by the South Coast Air Quality Management District (see guidance, page 23). | While total enclosures are required for secondary lead smelters, they are not required for primary copper smelters.<br><br>Generally, material storage piles are controlled via wind fences and water sprays. | Control sources of fugitive dust emissions within total enclosures that are maintained under negative pressure and vented to a control device designed to capture lead particulate. (See § 63.544).                     | Meets RACM. Although total enclosures for materials storage, such as the acid plant scrubber blowdown solids, are not required under NESHAPs for primary copper smelters, ASARCO is required to install such system as part of the Consent Decree.<br><br>The new system dries the acid plant's scrubber blowdown solids in a total enclosure, with a dryer system maintained under negative pressure in order to minimize emissions. Such control then, is more stringent for a primary copper smelter and therefore, constitutes RACM. |
| RECORDKEEPING & REPORTING                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                               |                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Current and past fugitive dust plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Recordkeeping and reporting requirements were not discussed.                                                                                                                                                                                                                                   | No recordkeeping requirements pertaining to dust sources were identified.                                                                                                                                     | Records that must be kept/maintained in a "form suitable and readily available for expeditious review" include: inspections, cleaning of paved roads, corrective actions, and malfunctions. (See §§ 63.546 and 63.550). | Meets RACM. Even though records for fugitive dust sources are not required under NESHAPs for primary copper smelters, the Hayden Pb dust rule requires similar records to those under NESHAPs for secondary lead smelters.                                                                                                                                                                                                                                                                                                               |
| Physical inspection sheets, checklists, and/or log sheets.                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                               |                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| All records of unpaved road stabilization and opacity tests and materials piles moisture content tests, if any.                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                               |                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Maintenance, inspections, quality assurance and control, samples, and wind data from ambient air and meteorological stations, in addition to records of periods where monitors are inoperative.                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                               |                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                    | 2008 Pb NAAQS RACM Guidance<br>for Secondary Lead Smelter<br>Source Category & Fug. Dust | NESHAPs for Primary Copper<br>Smelters (40 CFR Part 63, Subpart<br>QQQ) *MACT                                                                                               | NESHAPs for Secondary Lead<br>Smelters (40 CFR Part 63, Subpart<br>X) *MACT                                         | R18-2-B1301.01 Evaluation                                                                                                                             |
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| Recordkeeping system for fugitive dust sources, including visible emissions observations, corrective actions, water sprayer operations, chemical dust suppression application, timing of paved road cleaning, Reference Method 9 opacity readings, operating conditions, calibration records for measurement devices, and records for operational deviations. |                                                                                          |                                                                                                                                                                             |                                                                                                                     |                                                                                                                                                       |
| Records must be maintained for 5 years and kept onsite for at least 2 years.                                                                                                                                                                                                                                                                                  |                                                                                          | Records must be kept on site for at least 2 years after the date of record. Records must be maintained for 5 years. (See § 63.1456).                                        | Records must be kept on site for at least 2 years after the date of record. Records must be maintained for 5 years. | Meets RACM. The records retention requirement is consistent with NESHAPs for both source categories.                                                  |
| Quarterly reports that include visible emissions observations, high wind event dates, corrective actions, progress on control construction, raw monitoring data and calculated ambient air concentrations.                                                                                                                                                    |                                                                                          | Must submit semiannual compliance reports that include any deviations from work practice standards (which would apply to fugitive dust control practices). (See § 63.1455). | Must submit reports no less frequent than specified under § 63.10(e)(3) of General Provisions (see § 63.550).       | Meets RACM. NESHAPs for primary copper smelters require semiannual reports, whereas the Hayden Pb dust rule requires more frequent quarterly reports. |

#### 4.7.2.2 Comparison to General Preamble Control Menu & Evaluation

Appendix 1 of the General Preamble for the Implementation of Title I of the Clean Air Act<sup>110</sup> lists specific available control measures for fugitive lead-bearing dust; most measures mirror those in Appendix C1 of the General Preamble for non-leaded particulate matter. Appendix 1 measures are required to be considered in any RACM analysis. These measures, along with ADEQ's evaluation of R18-2-B1301.01, is in Table 4-6 below. Requirements in R18-2-B1301.01 are generally consistent with those in Appendix C1.

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<sup>110</sup> See 58 FR 67752 (Dec. 22, 1993).

Table 4-6 Comparison & Evaluation of Pb Dust Rule to General Preamble Control Menu

| General Preamble Control Measure                                                                                                                                                                                                                                | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| <b>Pave, vegetate, or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.</b>                                                                                                                                                 | Requires application of chemical dust suppressants on high-leaded unpaved roads, including access points where unpaved roads meet paved roads. See subsection (D)(10).                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Require dust control plans for construction or land-clearing projects.</b>                                                                                                                                                                                   | Not applicable to any significant source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Require haul trucks to be covered.</b>                                                                                                                                                                                                                       | Requires that trucks hauling fugitive lead dust sources to be covered by a tarp and compartments to be free of holes. See subsection (D)(4).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Provide for traffic rerouting or rapid clean-up of temporary (and not readily preventable) sources of dust on paved roads (water erosion runoff, mud/dirt carryout areas, material spills, skid control sand). Delineate who is responsible for cleanup.</b> | Requires clean-up of spillage that extends 50 linear feet or more as expeditiously as practicable, and at the end of the work day for all other spillage. See subsection (D)(9)(c).                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Require paving, chemically stabilizing, or otherwise stabilizing permanent unpaved haul roads, and parking or staging areas at commercial, municipal, or industrial facilities.</b>                                                                          | Requires chemical dust suppression for high-leaded unpaved roads, including haul roads, access points, and areas of vehicle handling of material. See subsection (D)(10)(a).                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Develop traffic reduction plans for unpaved roads. Use of speed bumps, low speed limits, etc., to encourage use of other (paved) roads.</b>                                                                                                                  | Requires a speed limit of 15 mph with posted signs. See subsection (D)(10)(h).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Limit use of recreational vehicles on open land.</b>                                                                                                                                                                                                         | Not applicable to any significant source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Require curbing and pave or stabilize (chemically or with vegetation) shoulders of paved roads.</b>                                                                                                                                                          | Paved roads make up roughly 1.3% of the total 2017 base year emissions inventory for the Hayden facility. There are generally more significant emissions reductions achieved through daily paved road cleaning. Additionally, curbing paved roads is identified as BACM in other serious PM <sub>10</sub> NAAs, such as Imperial and San Joaquin Valley Counties. The Hayden Pb NAA is required to meet RACM requirements. Therefore, due to this being an insignificant source that is already effectively controlled via daily cleaning, a BACM measure like curbing would not significantly reduce emissions to expedite attainment. |
| <b>Pave or chemically stabilize unpaved roads.</b>                                                                                                                                                                                                              | Requires chemical dust suppression for high-leaded unpaved roads, including access points and areas of vehicle handling of material. See subsection (D)(10).                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Pave, vegetate, or chemically stabilize unpaved parking areas.</b>                                                                                                                                                                                           | Not applicable to any significant source (see Emissions Inventory TSD in Appendix A).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Require dust control measures for material storage piles.</b>                                                                                                                                                                                                | Requires wind fences, water sprays, and concrete pads for concentrate storage and reverts crushing; requires wind fences and water sprays for all other dust sources (uncrushed reverts and bedding materials). Scrubber blowdown solids from the acid plant that were previously dried outdoors will now be required to be dried in an enclosed system with a dryer maintained under negative pressure. See subsections (D)(11) - (D)(15).                                                                                                                                                                                             |

| General Preamble Control Measure                                                                                                                                                             | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <b>Provide for storm water drainage to prevent water erosion onto paved roads.</b>                                                                                                           | Due to the arid climate of the Hayden NAA, water erosion runoff only infrequently occurs during periods of heavy rain, usually generated by intense, localized thunderstorms that occur in the late summer and early fall. Runoff is generally contained in stream and normally dry wash channels. Any erosion on paved surfaces is usually narrowly restricted to where these flows may cross roadways. Because emissions from entrainment of erosion sediment on paved roads are very localized and minimal, and rerouting of storm water channels or roadways require significant time and infrastructure investment, this measure is not feasible. This measure also would not significantly advance attainment of the NAAQS due to substantial research and infrastructure development. Furthermore, subsection (D)(9)(c) already requires rapid clean-up of trackout and carryout, which would also clean up any erosion of material following these infrequent rain events. |
| <b>Require revegetation, chemical stabilization, or other abatement of wind erodible soil, including lands subjected to water mining, abandoned farms, and abandoned construction sites.</b> | Not applicable to any significant source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Rely upon the soil conservation requirements of the Food Security Act to reduce emissions from agricultural operations.</b>                                                               | Not applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Require washing of undercarriages and wheels of vehicles immediately prior to leaving the plant area.</b>                                                                                 | While the rule does not explicitly require wheel and/or undercarriage washing, rumble grates are required for the bedding plant area. See subsection (D)(14)(c). Furthermore, wheel washes are considered BACM in Imperial County, CA and Maricopa County, AZ for serious PM <sub>10</sub> areas. Because the Hayden Pb NAA is required to implement RACM instead, and because roads are a rather insignificant source, rumble grates at the bedding area are sufficient.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Require that water used for dust suppression and vehicle washing contain a limited amount of lead (e.g. less than or equal to 0.1 ppm).</b>                                               | Chemical suppressants, rather than water, are used for control of dust from unpaved roads. Vehicle washing is also not required. Therefore, this RACM measure is not applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

While the General Preamble suggests paving unpaved roads, the Hayden Pb NAA's attainment strategy depends on a chemical dust suppression application intensity and schedule that achieves a 90 percent control efficiency. This is greater than the paving control efficiency EPA cites in the 2008 Pb NAAQS RACM guidance, which is 66 percent.<sup>111</sup> Therefore, chemical dust suppression is required rather than paving to achieve the higher control efficiency. The dust suppression control efficiency is required under the Consent Decree, and its inclusion in the Pb dust rule makes this requirement enforceable after the Consent Decree is terminated or expired.

Additionally, while paving is a suggested RACM in EPA's 2008 Pb NAAQS RACM guidance, so is chemical dust suppression, which is considered BACM in Maricopa County as well as other Southwestern states, including California and Nevada (see Table 4-7). As shown in Chapter 5, Hayden is projected to attain the NAAQS using chemical dust suppression on unpaved roads. Considering that chemical dust suppression

<sup>111</sup> See *Implementation of the 2008 Lead National Ambient Air Quality Standards Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions*, U.S. EPA, March 2012, page 24.

already achieves 90 percent control efficiency and that unpaved roads constitute a small portion of the base year emissions inventory, paving would not expedite attainment any quicker than already required.

Furthermore, ADEQ analyzed unpaved roads at ASARCO's Hayden Operations and determined which ones had the highest Pb content, referring to samples taken between 2013 and 2015 during EPA's Remedial Investigation and Feasibility Study. The analysis shows that not all unpaved roads at ASARCO's facility have the same amount of Pb content. The unpaved roads with the highest Pb content are the slag hauler road and the concentrate storage area. The chemical dust suppression application intensity and schedule in the rule mirrors what ASARCO developed for its Fugitive Dust Plan required by the Consent Decree. The rule thereby focuses on the unpaved road that has the highest Pb content, the slag hauler road, which is required to have the most frequent application of chemical dust suppressants (the rule also requires application on additional unpaved roads). While there will be no chemical dust suppression applied on the concentrate storage area roads, the Pb content of the surrounding unpaved roads will decrease due to the use of concrete pads, wind fences, and water suppression for concentrate storage. For ADEQ's complete analysis, refer to the "Unpaved Road De Minimis Analysis" in the Modeling TSD in Appendix B of the 2017 SIP.

In summary, while the General Preamble suggests paving unpaved roads, the fugitive Pb dust rule focuses on those roads that have the most Pb content and requires chemical dust suppression for its higher control efficiency. Chemical dust suppression is also a recognized BACM in other Southwestern states.

In general, R18-2-B1301.01 contains most fugitive Pb dust controls identified by EPA in the General Preamble. While R18-2-B1301.01 is focused on a point source, rather than a county-level distribution of different sources (such as in a PM<sub>10</sub> NAA), the controls ASARCO will be using to control leaded fugitive dust are similar to those identified in Appendix 1 of the General Preamble.

#### 4.7.2.3 Comparison to Other PM<sub>10</sub> Rules & Evaluation

While the fugitive Pb dust rule is focused on leaded dust, EPA expects that the rule should also meet RACM for non-leaded particulate matter, or PM<sub>10</sub>. For this analysis, ADEQ referred to rules approved by EPA in Nevada, California, and Arizona. These rules were approved by EPA as BACM for serious PM<sub>10</sub> nonattainment areas. The PM<sub>10</sub> rules incorporated in this analysis include:

- San Joaquin Valley Air Pollution Control District, CA
- Imperial County Air Pollution Control District, CA
- Clark County Department of Air Quality, NV
- Maricopa County Air Quality Department, AZ

PM<sub>10</sub> emission control rules developed by these areas were reviewed, summarized, and grouped by source category for use in assessing commonalities and differences in the Hayden Pb NAA's control strategy. The results are used to identify the level of control, the applicability for the Hayden Pb NAA, and the general consistency between requirements. The comparative results are summarized in Table 4-7 below.

In summary, the measures that control leaded dust via R18-2-B1301.01 are generally consistent with and conform to non-leaded PM<sub>10</sub> rules in other Pacific Southwestern states.

Table 4-7 Comparison & Evaluation of Pb Dust Rule to PM<sub>10</sub> Rules

| (SELECTED) DEFINITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                           |                               |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                    |                                            |                                                                                                                                                                                                                                                           |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                       | Maricopa County AQD, AZ *BACM | Imperial County APCD, CA *BACM                                                                                                                                                                                                                                                                                                     | San Joaquin Valley APCD, CA *BACM                                                                                                  | Clark County Dept of Air Quality, NV *BACM | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                 |
| "High wind event" means any period of time beginning when the average wind speed, as measured at a meteorological station maintained by the owner or operator that is approved by the Department, is greater than or equal to 15 miles per hour over a 15 minute period, and ending when the average wind speed, as measured at the approved meteorological station maintained by the owner or operator, falls below 15 miles per hour over a 15 minute period." | No similar requirement.       | See rule 800, section C, which defines "wind gust" as: "Is the maximum instantaneous wind speed as measured by an anemometer." See also rule 801 for construction and earthmoving activities, which states that the 20% opacity limit shall not apply when wind gusts exceed 25 mph as long as there's a control measure in place. | See rule 8021 for construction and earthmoving activities, which requires activities to cease when VDE exceeds 20 percent opacity. | No similar requirement.                    | Meets RACM. While the "high wind event" definition is unique for ASARCO's purposes and consistent with the definition in the Consent Decree, it draws similarities with the Imperial County definition which uses a specific tool to measure wind speeds. |

## (SELECTED) DEFINITIONS

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                 | Maricopa County AQD, AZ *BACM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Imperial County APCD, CA *BACM                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | San Joaquin Valley APCD, CA *BACM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Clark County Dept of Air Quality, NV *BACM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                             |
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| "Lead-bearing fugitive dust" means uncaptured and/or uncontrolled particulate matter containing lead that is entrained in the ambient air and is caused by activities, including, but not limited to, the movement of soil, vehicles, equipment, and wind. | See rule 310, section 200, which defines "fugitive dust" as: "The particulate matter not collected by a capture system, that is entrained in the ambient air, and is caused from human and/or natural activities, such as, but not limited to, the movement of soil, vehicles, equipment, blasting, and wind. For the purpose of this rule, fugitive dust does not include particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines, from portable brazing, soldering, or welding equipment, and from pile drivers, and does not include emissions from process and combustion sources that are subject to other rules in Regulation III (Control of Air Contaminants) of these rules." | See rule 800, section C, which defines "fugitive dust" as: "The particulate matter entrained in the ambient air which is caused from man-made and natural activities such as, but not limited to, movement of soil, vehicles, equipment, blasting, and wind. This excludes particulate matter emitted directly in the exhaust of motor vehicles or other fuel combustion devices, from portable brazing, soldering, or welding equipment, pile drivers, and stack emissions from stationary sources." | See rule 8011, section C, which defines "fugitive dust" as: "any solid particulate matter entrained in the ambient air which is caused by anthropogenic or natural activities which is emitted into the air without first passing through a stack or duct designed to control flow, including, but not limited to, emissions caused by movement of soil, vehicles, equipment, and windblown dust. This excludes particulate matter emitted directly in the exhaust of motor vehicles, from other fuel combustion devices, portable brazing, soldering, or welding equipment, and from pile drivers." | See Section 0, which defines "fugitive dust" as: particulate matter, that is not collected by a capture system, is entrained in the ambient air and is caused from human and/or natural activities, such as, but not limited to, movement of soil, vehicles, equipment, blasting, and wind. For the purpose of these regulations, fugitive dust does not include particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines, from portable brazing, soldering, or welding equipment, and does not include emissions from process and combustion sources that are subject to other sections of these regulations." | Meets RACM. The "lead-bearing fugitive dust" definition draws several requirements from the other PM <sub>10</sub> rules (i.e. "entrained in the ambient air" and use of "uncaptured/uncontrolled") but is adapted for leaded particulate matter and to ASARCO's operations. The activities/sources listed in the other PM <sub>10</sub> rules are consistent with those listed in the Pb dust rule (i.e. movement of soil and wind). |

## (SELECTED) DEFINITIONS

| R18-2-B1301.01 Requirement                                                                                                                                                                                                        | Maricopa County AQD, AZ *BACM                                                                                                                                                                                                                                                                                                                                                                                                    | Imperial County APCD, CA *BACM                                                                                                                                                                                                                                                                  | San Joaquin Valley APCD, CA *BACM                                                                                                                                                                                                                                 | Clark County Dept of Air Quality, NV *BACM | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| "Material pile" means material, including concentrate, uncrushed reverts, crushed reverts, and bedding material, that is stored in a pile outside a building or warehouse and is capable of producing lead-bearing fugitive dust. | See rule 310, section 200, which defines "bulk material" as "any material, including but not limited to, the following materials that are capable of producing fugitive dust: earth; rock; silt; sediment; sand; gravel; soil; fill; aggregate less than 2 inches in length or diameter; dirt; mud; demolition debris; cotton; trash; cinders; pumice; sawdust; feeds; grains; fertilizers; fluff from shredders; dry concrete." | See rule 800, section C, which defines "bulk material" as: "Earth, rock, silt, sediment, sand, gravel, soil, fill, aggregate, dirt, mud, debris, and other organic and/or inorganic material consisting of or containing particulate matter with five percent or greater silt content...." etc. | See rule 8011, section 3.0, which defines "bulk material" as "any unpackaged material with a silt content of more than 5 percent." See also "open storage pile" which is defined as: "Any accumulation of bulk material, stored outside a building or warehouse." | No similar requirement.                    | Meets RACM. While Maricopa County and Imperial County have definitions for "bulk material" that do not include references to a pile, San Joaquin Valley's definition for "open storage pile" is similar to the Pb dust rule's definition. The definitions for "bulk material" use "...capable for producing fugitive dust," which is also used in the Pb dust rule. The San Joaquin rule's definition of "open storage pile" uses "...stored outside a building or warehouse," which is also used in the Pb dust rule. The Pb dust rule combines the language from these rules while adapting it specifically for ASARCO's operations. |

## (SELECTED) DEFINITIONS

| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                                                                                            | Maricopa County AQD, AZ *BACM                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Imperial County APCD, CA *BACM                                                                                                                                                                                                                                                                                                                                                                                                               | San Joaquin Valley APCD, CA *BACM                                                                                                                                                                                                                                                                                                                                                                                                                            | Clark County Dept of Air Quality, NV *BACM | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <p><i>"Non-smelting process sources"</i> means sources of lead-bearing fugitive dust that are not part of the hot metal process, which includes smelting in the INCO flash furnace, converting, and anode refining and casting. Non-smelting process sources include storage, handling, and unloading of concentrate, uncrushed reverts, crushed reverts, and bedding material; acid plant scrubber blowdown solids; and paved and unpaved roads.</p> | <p>See rule 310, section 200, which defines "dust-generating operation" as "Any activity capable of generating fugitive dust, including, but not limited to, the following activities: Land clearing, maintenance, and land clean-up using mechanized equipment; earthmoving; weed abatement by disking or blading; excavating; construction; demolition; bulk material handling; storage and/or transporting operations; operation of any outdoor equipment; operation of motorized machinery..." etc.</p> | <p>See rule 800, section C, which defines "earthmoving activities" as: "The use of any equipment for an activity that may generate fugitive dust emissions, including, but not limited to, cutting and filling, grading, leveling, excavation, trenching, loading or unloading of bulk materials, demolishing, drilling, adding to or removing bulk materials from open storage piles, weed abatement through disking and back filling."</p> | <p>See rule 8011, section 3.0, which defines "earthmoving activities" as: "The use of any equipment for an activity that may general fugitive dust emissions, including, but not limited to, cutting and filling, grading, leveling, excavating, trenching, loading or unloading of bulk materials, demolishing, blasting, drilling, adding to or removing bulk of materials from open storage piles, weed abatement through disking, and back-filling."</p> | <p>No similar requirement.</p>             | <p>Suggests RACM. This Pb dust rule definition is especially unique to ASARCO's operations and is consistent for a rule that controls leaded dust, as opposed to non-leaded dust. The sources of Pb dust listed in the definition are those found to be sources in ASARCO's operations. The PM<sub>10</sub> rules have definitions for bulk materials used in earthmoving/dust-generating activities, which is somewhat different from ASARCO's operations. While ASARCO's operations do generate dust, the Pb dust rule is focused on those that generate leaded dust. The Pb dust rule definition is consistent with the other PM<sub>10</sub> rules, in that it addresses storage, handling, and unloading of bulk materials.</p> |

| (SELECTED) DEFINITIONS                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                              | Maricopa County AQD, AZ *BACM                                                                                                                                                                                                                                                                                                                                                                      | Imperial County APCD, CA *BACM                                                                                                                                                                                                                         | San Joaquin Valley APCD, CA *BACM                                                                                                                                                                                                                                                                                                                                                                                                           | Clark County Dept of Air Quality, NV *BACM | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><i>“Storage and handling”</i> means all activities associated with the handling and storage of materials that take place at the Hayden Smelter, including, but not limited to, stockpiling, transport on conveyor belts, transport or storage in rail cars, crushing and milling, arrival and handling of offsite concentrate, bedding, and handling of reverts.</p> | <p>See rule 310, section 200, which defines "bulk material handling, storage, and/or transporting operation" as "the use of equipment, haul trucks, and/or motor vehicles, including, but not limited to, for the following activities that are capable of producing fugitive dust: loading; unloading; conveying; transporting; piling; stacking; screening; grading; moving bulk materials."</p> | <p>See definition for "Earthmoving Activities" referenced above, which includes loading/unloading of bulk materials, and adding to or removing materials from open storage piles.</p>                                                                  | <p>See rule 8011, section 3.0, which defines "bulk material handling, storage, and/or transporting operation" as: "includes but is not limited to the use of equipment, haul trucks, and/or motor vehicles for the loading, unloading, conveying, transporting, piling, stacking, screening, grading, or moving of bulk materials at an industrial, institutional, commercial, and/or governmental owned or operated site or facility."</p> | <p>No similar requirement.</p>             | <p>Meets RACM. While like in the other definitions the Hayden Pb dust rule is focused on ASARCO's operations, the definition is consistent with the other PM<sub>10</sub> rules in that it includes loading/unloading of materials, transportation of materials, and other handling. Furthermore, the consistent use of "including but not limited to" in the rules allows the definition to be applied to other sources if needed. This definition in the Pb dust rule is also consistent with the definition in the Consent Decree.</p> |
| <p><i>“Trackout/carry-out”</i> means any materials that adhere to and agglomerate on the surfaces of motor vehicles, haul trucks, and/or equipment (including tires) and that may then fall onto the road.</p>                                                                                                                                                          | <p>See rule 310, section 200, which defines "trackout/carryout" as "Any and all bulk materials that adhere to and agglomerate on the surfaces of motor vehicles, haul trucks, and/or equipment (including tires) and that have fallen or been deposited onto an area accessible to the public."</p>                                                                                                | <p>See rule 800, section C, which defines "trackout/carry-out" as: "Any and all bulk materials that adhere to and agglomerate on the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto the pavement."</p> | <p>See rule 8011, section 3.0, which defines "carryout and trackout" as: "any and all materials that adheres to and agglomerates on vehicles, haul trucks, and/or equipment (including trailers, tires, etc.) and falls onto a paved public road or the paved shoulder of a paved public road."</p>                                                                                                                                         | <p>No similar requirement.</p>             | <p>Meets RACM. The Hayden Pb dust rule definition is consistent with the other PM<sub>10</sub> rules. The other PM<sub>10</sub> rules apply to paved public roads, or an area accessible to the public. The Pb dust rule is more general, and uses "road" to include unpaved and paved roads in the facility, consistent with clean-up requirements in subsection (D)(9) and (D)(10).</p>                                                                                                                                                 |

| FUGITIVE DUST PLAN                                                                                  |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                |                                                                                                              |                                                                                                                                                        |
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| R18-2-B1301.01 Requirement                                                                          | Maricopa County AQD, AZ<br><i>*BACM</i>                                                                                                                                                                                                                          | Imperial County APCD, CA<br><i>*BACM</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | San Joaquin Valley APCD, CA<br><i>*BACM</i>                                                                                                                                                                                                                                                                                                                    | Clark County Dept of Air Quality, NV<br><i>*BACM</i>                                                         | R18-2-B1301.01 Evaluation                                                                                                                              |
| Development, implement, and follow a fugitive dust plan that addresses sources of fugitive Pb dust. | See rule 310, section 402, which requires a Dust Control Plan for any dust-generating operation that involves a disturbed surface area equal or greater than 0.10 acre. A plan must also be submitted if any application for a Dust Control permit is submitted. | See rule 800, which requires that Border Patrol, BLM, or any other owner or operator of a recreational OHV use area to prepare and follow a dust control plan for minimizing PM <sub>10</sub> emissions. The control requirements for each dust plan is tailored to each user's type of operation (i.e. recreational OHV use versus Border Patrol immigration monitoring practices).<br><br>See also rule 801 which requires dust control plan for construction and earthmoving activities. | See rule 8021, which requires a Dust Control Plan for Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities.<br><br>Rule 8011 also allows a Fugitive PM <sub>10</sub> Management Plan for unpaved roads and unpaved vehicle/equipment traffic areas in replace of compliance with applicable requirements in rules 8061 and 8071. | See rule 94, which requires owner or operators of construction activities to develop a Dust Mitigation Plan. | Meets RACM. The Hayden Pb rule is consistent with PM <sub>10</sub> rules applicable to other dust-generating operations like OHV use and construction. |

| PAVED ROADS                                                                                                                                                                             |                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |                                                                                                                                                                                      |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| R18-2-B1301.01 Requirement                                                                                                                                                              | Maricopa County AQD, AZ *BACM                                                                                                                                                                                       | Imperial County APCD, CA *BACM                                                                                                                                                                                    | San Joaquin Valley APCD, CA *BACM                                                                                                                                                    | Clark County Dept of Air Quality, NV *BACM                                                                                                                                                                                                    | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                   |
| Facility-wide, overall 20 percent opacity limit for all fugitive lead dust sources, including paved roads.                                                                              | See rule 310, section 303, which requires a general 20 percent opacity limit for dust-generating operations.                                                                                                        | No requirement for paved roads. (Note that rule 401, "Opacity of Emissions" was adopted prior to 1979 and has opacity-related limits based on the Ringlemann Chart, which does not seem to apply to paved roads.) | No requirement for paved roads. (Note the definition for "Limit Visible Dust Emissions to 20% Opacity" in rule 8011, which does not seem to apply to paved roads.)                   | See rules 91 and 93, which require a 20 percent opacity limit for unpaved roads and unpaved shoulders/medians of paved roads.                                                                                                                 | Meets RACM. The general use of a 20 percent opacity limit for dust sources, like paved roads, in Maricopa County (and in other states for sources other than paved roads) signify that this requirement maintains such consistency.                                                                                                                                                                                         |
| Clean roads at least once daily with a sweeper, vacuum, or wet broom in accordance with manufacturer recommendations.                                                                   | No requirement. (Referred to Rule 310).                                                                                                                                                                             | No requirement. (Referred to rules 800 and 805).                                                                                                                                                                  | See rule 8061, which requires each city, county, or state agency responsible for existing paved roads to purchase and use a PM <sub>10</sub> efficient street sweeper.               | See rule 93, which requires any street sweeping equipment to be PM <sub>10</sub> efficient. See also rule 94, which prohibits the use of dry rotary brushes and blower devices, unless sufficient water is applied, for cleaning paved roads. | Meets RACM. Both Maricopa County and Imperial County do not require paved road cleaning, and San Joaquin and Clark County require PM <sub>10</sub> -efficient sweepers, which are considered BACM, whereas the Hayden Pb NAA is required to implement RACM. Furthermore, the control efficiency from cleaning once daily was inputted into the modeling and brings the area into attainment, thereby reducing Pb emissions. |
| Rapidly clean up track-out and carry out on paved roads that extends a cumulative distance of 50 linear feet or more; clean all other trackout and carry out at the end of the workday. | See Maricopa County rule 310, section 306, which requires immediate clean-up when trackout extends 25 linear feet or more and at the end of the workday for all other trackout from areas accessible to the public. | See Imperial County rule 803, which requires immediate clean-up when trackout extends 50 linear feet or more and at the end of the workday for all other trackout.                                                | See San Joaquin Valley rule 8041, which requires trackout to be cleaned at the end of the work day, and immediately when trackout extends 50 linear feet or more within urban areas. | See Clark County rule 94, which applies to construction activities, and requires that mud or dirt not be tracked out onto a paved road if it extends 50 feet or more in cumulative length. (See also the Dust                                 | Meets RACM. The trackout clean-up requirements are generally consistent with other states' rules, which are considered BACM.                                                                                                                                                                                                                                                                                                |

| PAVED ROADS                              |                                                  |                                                  |                                                                                                                                                 |                                                                                                                                                        |                                                                                                                                                          |
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| R18-2-B1301.01 Requirement               | Maricopa County AQD, AZ <i>*BACM</i>             | Imperial County APCD, CA <i>*BACM</i>            | San Joaquin Valley APCD, CA <i>*BACM</i>                                                                                                        | Clark County Dept of Air Quality, NV <i>*BACM</i>                                                                                                      | R18-2-B1301.01 Evaluation                                                                                                                                |
|                                          |                                                  |                                                  |                                                                                                                                                 | Control Handbook, Best Management Practice 20 for Trackout/Carryout). Rule 93 also provides some protection against trackout via stabilized shoulders. |                                                                                                                                                          |
| Speed limit of 15 mph with signs posted. | No requirement. (Referred to rules 310 and 311). | No requirement. (Referred to rules 800 and 805). | No requirement for paved roads, however Rule 8021 requires speed limit of 15 mph for unpaved roads for earthmoving and construction activities. | No requirement (referred to rule 93).                                                                                                                  | Meets RACM. The speed limit is consistent with the limit set forth in San Joaquin's rules for unpaved roads for construction and earthmoving activities. |

| UNPAVED ROADS                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                             |                                                                           |                                                                                                                                                                               |
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| R18-2-B1301.01 Requirement                                                                                                                                      | Maricopa County AQD, AZ *BACM                                                                                | Imperial County APCD, CA *BACM                                                                                                                                                                                                                                     | San Joaquin Valley APCD, CA *BACM                                                                                                                                                                           | Clark County Dept of Air Quality, NV *BACM                                | R18-2-B1301.01 Evaluation                                                                                                                                                     |
| Facility-wide, overall 20 percent opacity limit for all fugitive lead dust sources, including unpaved roads.                                                    | See rule 310, section 303, which requires a general 20 percent opacity limit for dust-generating operations. | See rule 805, which requires a 20 percent opacity limit for unpaved roads. See also rule 801 for construction and earthmoving activities, which requires a 20 percent opacity limit for a construction site and for persons performing any earthmoving activities. | See rule 8061, which requires a 20 percent opacity limit for unpaved roads. See also rule 8021 for construction and earthmoving activities, which requires a 20 percent opacity limit.                      | See rule 91, which requires a 20 percent opacity limit for unpaved roads. | Meets RACM. The general use of a 20 percent opacity limit for dust sources in other states signify that this requirement maintains such consistency among sources and states. |
| Chemical dust suppression application for high-leaded unpaved roads, including slag hauler road, secondary crusher road, and reverts crushing operations roads. | See rule 310, section 305.7, which lists non-water dust suppression as a control measure.                    | See Rule 805, which lists chemical stabilization as a control measure. See also rule 801 for construction and earthmoving activities, which also requires chemical stabilization or water for unpaved haul/access roads.                                           | See rule 8061, which lists chemical suppressants as a control measure. See also rule 8021 for construction and earthmoving activities, which also requires chemical dust suppressants for unpaved surfaces. | See rule 91, which lists dust palliatives as a control measure.           | Meets RACM. The other states' rules constitute BACM and are consistent with Hayden's chemical dust suppression requirement.                                                   |

| UNPAVED ROADS                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                       |
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| R18-2-B1301.01 Requirement                                                                                                                                                    | Maricopa County AQD, AZ *BACM                                                                                                                                                                                                                                                                                                                                                                                  | Imperial County APCD, CA *BACM                                                                                                                                                                                                                                                                                                                                                                                                              | San Joaquin Valley APCD, CA *BACM                                                                                                                                                                                                                                                                                                                                                                                                                                          | Clark County Dept of Air Quality, NV *BACM                                                                                                                                                                                                                                                                                                                              | R18-2-B1301.01 Evaluation                                                                                                                                                                             |
| Soil stabilization requirements for unpaved roads, which are a 20 percent opacity limit, silt loading limit of 0.33 oz/ft <sup>2</sup> , and silt content limit of 6 percent. | See Maricopa County rule 310, section 304.2, which requires a 20 percent opacity limit for unpaved haul/access roads as determined by test method in Appendix C, Section 2.1 (EPA-approved unpaved road opacity observations method), and same silt loading and silt content requirements for unpaved roads, as determined by test method in Appendix C, Section 2.1 (EPA-approved soil stabilization method). | See Imperial County Rule 805, which requires a 20 percent opacity limit for unpaved haul/access roads and unpaved roads as determined by test method in Rule 800, Appendix A, Section A (same EPA-approved unpaved road opacity observations method), and same silt loading and silt content requirements for unpaved roads, as determined by test method in Rule 800, Appendix B, Section C (same EPA-approved soil stabilization method). | See San Joaquin Valley rule 8061, which requires a 20 percent opacity limit for any unpaved road segment with 26 or more average annual daily trips, as determined by test method in rule 8011, Appendix A, Section 1 (same EPA-approved unpaved road opacity observations method), and same silt loading and silt content requirements for unpaved roads, as determined by test method in rule 8011, Appendix B, Section 3 (same EPA-approved soil stabilization method). | See Clark County rule 91, which requires a 20 percent opacity limit, as determined by test method in rule 91, subsection 91.4.1 (same EPA-approved unpaved road opacity observations), and same silt loading and silt content requirements for unpaved roads, as determined by test method in rule 91, subsection 91.4.1 (same EPA-approved soil stabilization method). | Meets RACM. The soil stabilization requirements are consistent with other states' rules, which constitute BACM, and are the same methods EPA has approved in Maricopa County, California, and Nevada. |
| Maintain back-up watering trucks and personnel for visible emissions control.                                                                                                 | While back-up water trucks are not explicitly required, Maricopa County rule 310, section 305.7 lists watering as a control measure for unpaved haul/access roads.                                                                                                                                                                                                                                             | While back-up water trucks are not explicitly required, Imperial County rule 805 lists watering as a control measure for unpaved roads.                                                                                                                                                                                                                                                                                                     | While back-up water trucks are not explicitly required, San Joaquin Valley rule 8061 lists watering as a control measure for unpaved roads.                                                                                                                                                                                                                                                                                                                                | While back-up water trucks are not explicitly required, Clark County rule 91 allows other alternative control measures as approved by the Control Officer and Region IX, which could include watering.                                                                                                                                                                  | Meets RACM. The back-up watering trucks requirement is in addition to the chemical dust suppressants.                                                                                                 |

| UNPAVED ROADS                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                 |                                                                                                                                                                                                                                      |                                                                  |                                                                                                                                                                                                                |
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| R18-2-B1301.01 Requirement                                                                                                                         | Maricopa County AQD, AZ *BACM                                                                                                                                                                                  | Imperial County APCD, CA *BACM                                                                                                                                  | San Joaquin Valley APCD, CA *BACM                                                                                                                                                                                                    | Clark County Dept of Air Quality, NV *BACM                       | R18-2-B1301.01 Evaluation                                                                                                                                                                                      |
| Immediate, but no later than 30 minutes after observation, application of water or chemical dust suppressant where visible emissions are observed. | No requirement. (Referred to rule 310).                                                                                                                                                                        | No requirement. (Referred to rules 800 and 805).                                                                                                                | No requirement. (Referred to rule 8061).                                                                                                                                                                                             | No requirement. (Referred to rule 91).                           | Meets RACM. This corrective measure for visible emissions from unpaved roads provides additional protection.                                                                                                   |
| Reapplication of chemical dust suppressants within 24 hours of discovery of breakdown.                                                             | No requirement. (Referred to rule 310).                                                                                                                                                                        | No requirement. (Referred to rules 800 and 805).                                                                                                                | While no specific requirement in rule 8061 is listed, rule 8071 has similar re-application requirements for water or chemical suppressants for unpaved vehicle/equipment traffic areas with more than 50 Average Annual Daily Trips. | No requirement. (Referred to rule 91).                           | Meets RACM. Like the visible emissions corrective action above, this requirement goes beyond to provide further protection against dust emissions.                                                             |
| Collection and prevention of runoff and/or sweeping material                                                                                       | No specific requirement for unpaved roads, however Maricopa County rule 310, section 306 has trackout/carry-out requirements for paved roads where areas are accessible to the public (see Paved Roads above). | No specific requirement for unpaved roads, however Imperial County rule 803 has trackout/carry-out requirements for <i>paved roads</i> (see Paved Roads table). | No specific requirement for unpaved roads, however San Joaquin Valley rule 8041 has trackout/carry-out requirements for <i>paved public roads</i> (see Paved Roads table).                                                           | No requirement. (Referred to Clark County rules 41, 91, and 93). | Meets RACM. None of the other states included in this analysis have requirements to minimize runoff and sweeping material on unpaved roads. This measure adds additional protection to prevent dust emissions. |
| Speed limit of 15 mph with posted signs.                                                                                                           | See rule 310, section 304.2, which as an alternative to stabilization requirements for unpaved roads, allows for limiting vehicle trips to no more than 20 per day                                             | See rule 800, which lists available control measures for unpaved roads and unpaved vehicle/equipment traffic                                                    | See rule 8021 for construction and earthmoving activities, which requires a speed limit of 15 mph with posted signs for uncontrolled unpaved                                                                                         | No requirement. (Referred to rule 91).                           | Meets RACM. The Hayden Pb rule speed limit is consistent with limits in Maricopa, Imperial, and San Joaquin Counties.                                                                                          |

| UNPAVED ROADS              |                                                                                                                                                                                                                                                                 |                                              |                                              |                                                   |                           |
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| R18-2-B1301.01 Requirement | Maricopa County AQD, AZ <i>*BACM</i>                                                                                                                                                                                                                            | Imperial County APCD, CA <i>*BACM</i>        | San Joaquin Valley APCD, CA <i>*BACM</i>     | Clark County Dept of Air Quality, NV <i>*BACM</i> | R18-2-B1301.01 Evaluation |
|                            | and limiting speeds to no more than 15 mph. (See also rule 310, section 305.2, which requires a 15-mph speed limit; rule 310, section 305.6, which requires a 15-mph speed limit; as well as rule 310, section 305.7 which also requires a 15-mph speed limit.) | areas that includes a speed limit of 15 mph. | haul/access roads within construction sites. |                                                   |                           |

| MATERIAL STORAGE PILES & MATERIAL HANDLING                                                                                                                   |                                                                                                                                                                                               |                                                                                                                                                                                                 |                                                                                                                                                                                |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                   |
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| R18-2-B1301.01 Requirement                                                                                                                                   | Maricopa County AQD, AZ<br>*BACM                                                                                                                                                              | Imperial County APCD, CA<br>*BACM                                                                                                                                                               | San Joaquin Valley APCD, CA<br>*BACM                                                                                                                                           | Clark County Dept of Air Quality, NV<br>*BACM                                                                                                                                                                                                                        | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                         |
| Facility-wide, overall 20 percent opacity limit for all fugitive lead dust sources, including storage piles.                                                 | See rule 310, section 303, which requires a general 20 percent opacity limit for dust-generating operations.                                                                                  | See rule 802, which requires a 20 percent opacity limit for bulk material handling, storage, haul trucks, and transport.                                                                        | See rule 8031, which requires a 20 percent opacity limit for bulk material handling, storage, and transport.                                                                   | See rules 91 and 93, which require a 20 percent opacity limit for unpaved roads and paved roads, but no such specific requirement for storage piles.<br><br>See also rule 94, which requires a 20 percent opacity limit for construction and earthmoving activities. | Meets RACM. The general use of a 20 percent opacity limit for dust sources in other states signify that this requirement maintains such consistency among sources and states.                                                                                                                                                                     |
| Material conveyor systems drop heights must be minimized to the greatest extent practicable and any spillage must be cleaned within 30 minutes of discovery. | See Maricopa County rule 310, section 305.4, which lists control options for bulk material stacking, loading, and unloading, including mixing materials with water or non-water suppressants. | See Imperial County rule 802, which lists several measures for bulk material handling/transfer, which include water sprays at transfer points, chemical stabilization, or sheltering/enclosing. | See San Joaquin Valley rule 8031, which requirements that any transport of bulk material using a chute or conveyor to be either fully enclosed, sprayed with water, or washed. | See Clark County rule 94, which includes materials storage and handling for construction and earthmoving activities. Sources must choose controls listed in Dust Control Handbook (conveyor belts not addressed).                                                    | Meets RACM. Although other states require water suppression, enclosing, or other stabilization requirements, these constitute BACM and are therefore not applicable to the Hayden Pb NAA, which must meet RACM requirements. Minimizing drop heights and requiring quick clean-up will provide enough emissions minimization to reach attainment. |

| MATERIAL STORAGE PILES & MATERIAL HANDLING                                                                                                                                       |                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| R18-2-B1301.01 Requirement                                                                                                                                                       | Maricopa County AQD, AZ<br>*BACM                                                                                                                                                                     | Imperial County APCD, CA<br>*BACM                                                                                                                                                                                                                                                                                                            | San Joaquin Valley APCD, CA<br>*BACM                                                                                                                                                                                                                                                                                                            | Clark County Dept of Air Quality, NV<br>*BACM                                                                                                                                                                                                                          | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Storage of concentrate and crushed reverts must be on concrete pads.                                                                                                             | No requirement (Referred to rule 310).                                                                                                                                                               | No requirement. (Referred to rule 802).                                                                                                                                                                                                                                                                                                      | No requirement (referred to rule 8031).                                                                                                                                                                                                                                                                                                         | See rule 94, which includes materials storage and handling for construction and earthmoving activities. Sources must choose controls listed in Dust Control Handbook (no use of concrete pads included in Handbook).                                                   | Suggests RACM. These particular Pb dust sources must be stored on a concrete pad to prevent re-entrainment. No other states included in this analysis require such concrete pads.                                                                                                                                                                                                                                                                                 |
| Water sprays for storage piles, requiring a 10 percent surface moisture content, as determined by ASTM method D2216-10, for concentrate, crushed reverts, and bedding materials. | See Maricopa County rule 310, section 305.5, which lists several available options, including watering to achieve a minimum 12 percent soil moisture content, as determined by ASTM method D2216-05. | See Imperial County rule 802, which lists several measures, which include application of water or chemical suppressants on bulk material storage piles. No surface moisture content is required. See also rule 801 for construction and earthmoving activities, which requires water or chemical stabilization in addition to wind barriers. | See San Joaquin Valley rule 8031, which lists several measures, including watering to limit opacity to 20 percent or less, as determined by test method in rule 8011, Appendix A, Section 2. See also rule 8021 for construction and earthmoving activities, which requires water or chemical suppressants to be used along with wind barriers. | See Clark County rule 94, which includes materials storage and handling for construction and earthmoving activities. Sources must choose controls listed in Dust Control Handbook (See Best Management Practice 19 for Stockpiling, which includes water suppression). | Meets RACM. The general use of watering for bulk materials suggests this requirement is consistent with other states. Some variation exists between moisture content limits, but rule's 10 percent moisture content requirement is consistent with ASARCO's Consent Decree with EPA, and the test method provides enforceability. (Please note that uncrushed reverts are not required to have 10 percent moisture content due to the porosity of the materials.) |

| MATERIAL STORAGE PILES & MATERIAL HANDLING                                                                                                               |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                |
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| R18-2-B1301.01 Requirement                                                                                                                               | Maricopa County AQD, AZ<br>*BACM                                                                                                                                                                                                                                                         | Imperial County APCD, CA<br>*BACM                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | San Joaquin Valley APCD, CA<br>*BACM                                                                                                                                                                                                                                                                                                                                                                                                                | Clark County Dept of Air Quality, NV<br>*BACM                                                                                                                                                                                                                                                                                | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                      |
| Wind fences for storage piles, with material pile height not to exceed wind fence height, and the wind fence must have a porosity of 50 percent or less. | See Maricopa County rule 310, section 305.5, which lists several measures, including wind barriers, storage silos, or three-sided enclosures to be used in conjunction with watering. The 3-sided enclosure height must equal the pile height and must have 50 percent or less porosity. | See Imperial County rule 802, which lists several measures, which include wind barriers/fences with less than 50 percent porosity in conjunction with water or chemical suppressants. Rule 802 also lists a 3-sided structure as a measure, with less than 50 percent porosity and a height that is at least equal to the bulk material pile height. See also rule 801, for construction and earthmoving activities, which requires wind fences to be used in conjunction with water or chemical suppressants. | See San Joaquin Valley rule 8031, which lists several measures, including wind barriers with less than 50 percent porosity to be used in conjunction with water or chemical suppressants. A 3-sided structure is also an available measure, with a height at least equal to storage pile height. See also rule 8021 for construction and earthmoving activities, which requires wind barriers to be used along with water or chemical suppressants. | See Clark County rule 94, which includes materials storage and handling for construction and earthmoving activities. Sources must choose controls listed in Dust Control Handbook (See BMP 19 for Stockpiling, which includes a 3-sided barrier with height equal to pile height and with a porosity of 50 percent or less). | Meets RACM. This rule requirement blends other states' requirements, which are considered BACM. The rule is consistent with the general 50 percent porosity requirement, as well as material pile height limits. Like the other states, ASARCO must use the wind fences in conjunction with water suppression. |
| Materials being transported by vehicle must be covered by a tarp and the cargo compartment must be free of holes or other openings.                      | See Maricopa County rule 310, section 305.1 and 305.2, which requires haul truck loads of bulk materials to be covered by a tarp and that cargo compartments must be free of holes or other openings.                                                                                    | See Imperial County rule 802, which requires all haul truck loads of bulk materials to be completely covered or enclosed and that cargo compartments must be free of holes or other openings.                                                                                                                                                                                                                                                                                                                  | See San Joaquin Valley rule 8031, which lists several control measures, including covering haul trucks with a tarp and that cargo compartments must be free of holes or other openings.                                                                                                                                                                                                                                                             | See Clark County rule 94, which includes materials storage and handling for construction and earthmoving activities.                                                                                                                                                                                                         | Meets RACM. This requirement is consistent with the other states' rules.                                                                                                                                                                                                                                       |

| MATERIAL STORAGE PILES & MATERIAL HANDLING                                                                           |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| R18-2-B1301.01 Requirement                                                                                           | Maricopa County AQD, AZ<br>*BACM                                                                                                                                                                                                                                      | Imperial County APCD, CA<br>*BACM                                                                                                                                                                                                                                                                                                                                                   | San Joaquin Valley APCD, CA<br>*BACM                                                                                                                                                                                                                                                                                                                                                  | Clark County Dept of Air Quality, NV<br>*BACM                                                                        | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                           |
| Water suppression or handling postponement during high wind events.                                                  | While there is no requirement in Maricopa County's fugitive dust rule 310, there are similar requirements for nonmetallic mineral processing sources in rule 316, section 306. Rule 316 requires water suppression or ceasing operations during periods of high wind. | See rule 801 for Construction and Earthmoving Activities, where activity postponement and water suppression are available control measures during high winds.                                                                                                                                                                                                                       | See rule 8021 for Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities, which requires ceasing operations when the 20 percent opacity limit is exceeded due to wind.                                                                                                                                                                                    | See rule 94, which includes materials storage and handling for construction and earthmoving activities.              | Meets RACM. This requirement is similar to other states' high wind control measures pertaining to nonmetallic mineral processing and construction.                                                                                                                                                                                                                                                                  |
| Maintain rumble grates at all of the bedding plant area's entrances and exits for control of dust from loader tires. | See Maricopa County rule 310, section 306, which requires trackout control devices, including wheel wash systems, gravel pads, grizzly or rumble grates, or paving, for all exits onto areas accessible to the public at certain work sites.                          | See Imperial County rule 803, which lists control measures, including a track-out control device for all sites with access to a paved road and with 150 or more average vehicle trips per day, or 20 or more average vehicle trips per day by vehicles with three or more axles. Available trackout control devices include gravel pads, grizzlies, wheel wash systems, and paving. | See San Joaquin Valley rule 8041, which requires a trackout control device for any owner or operator of a site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with 3 or more axles, and any owner or operator of an operation subject to a Dust Control Plan. Available trackout control devices include grizzlies, gravel pads, and paving. | See Clark County rule 94, which includes materials storage and handling for construction and earthmoving activities. | Meets RACM. While the other states may require trackout control devices at paved roads on work sites or public areas, these are considered BACM in other states, whereas the Hayden Pb NAA is required to meet RACM. Therefore, the rule requires a trackout control device (rumble grates) at the bedding plant area due to its traffic use. This requirement is consistent with ASARCO's Consent Decree with EPA. |

| Recordkeeping and Reporting                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                    | Maricopa County AQD, AZ<br>*BACM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Imperial County APCD, CA<br>*BACM                                                                                                                                                                                                                                                                                                                | San Joaquin Valley APCD, CA<br>*BACM                                                                                                                                                                                                                                                                           | Clark County Dept of Air Quality, NV<br>*BACM                                                                                                                                                                                                                                                                                                                                                                                                                                       | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Current and past fugitive dust plans.                                                                                                                                                                                                                                                                                                                         | See rule 310, section 502, which requires records relating to Dust Control Plans, consisting of evidence of inspections, clean-up measures, water usage, dust suppressant application, frequency, implementation of controls, results of test methods, etc. Also requires records for any operations not subject to a Dust Control Plan that provide evidence of control measure application, with type, extent of coverage, and date applied. Records must be retained for 2 years after the date of when such records were initiated. For any Title V sources, records must be retained for at least 5 years. | See rule 800, which requires records that provide evidence of control measure application and compliance with the rule. The records must describe the type of treatment/control measure, extent of coverage, and date applied, include frequency. Records must be retained for 2 years after date of each entry and available upon APCD request. | See rule 8011, which requires records for when a control measure is implemented, including type of control, location, date, frequency, etc. Records must be retained for one year following termination of dust-generating activities. For any Title V sources, records must be retained for at least 5 years. | For unpaved roads, rule 91 requires records that provide evidence of control measure application, coverage, and date applied. Records must be retained for at least 1 year. Written reports must also be submitted to document compliance. For paved roads, rule 93 requires records that provide evidence of control measure application, coverage, and date applied. Records must be retained for at least 1 year. Written reports must also be submitted to document compliance. | Meets RACM. The Hayden Pb dust rule requires that current and past fugitive dust plans be retained for at least 5 years and kept on-site for at least 2 years. Similar records include evidence of type of control applied, frequency, date of application, any corrective measures taken, etc. In general, the Hayden Pb dust rule requires similar records at other states' rules, with the same, if not longer, retention schedule. In addition to recordkeeping, the rule requires quarterly reporting. |
| Physical inspection sheets, checklists, and/or logsheets.                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| All records of unpaved road stabilization and opacity tests and materials piles moisture content tests, if any.                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Maintenance, inspections, quality assurance and control, samples, and wind data from ambient air and meteorological stations, in addition to records of periods where monitors are inoperative.                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Recordkeeping system for fugitive dust sources, including visible emissions observations, corrective actions, water sprayer operations, chemical dust suppression application, timing of paved road cleaning, Reference Method 9 opacity readings, operating conditions, calibration records for measurement devices, and records for operational deviations. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Recordkeeping and Reporting                                                                                                                                                                                |                                  |                                   |                                      |                                               |                           |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                 | Maricopa County AQD, AZ<br>*BACM | Imperial County APCD, CA<br>*BACM | San Joaquin Valley APCD, CA<br>*BACM | Clark County Dept of Air Quality, NV<br>*BACM | R18-2-B1301.01 Evaluation |
| Records must be maintained for 5 years and kept onsite for at least 2 years.                                                                                                                               |                                  |                                   |                                      |                                               |                           |
| Quarterly reports that include visible emissions observations, high wind event dates, corrective actions, progress on control construction, raw monitoring data and calculated ambient air concentrations. |                                  |                                   |                                      |                                               |                           |

#### 4.7.2.4 Comparison to South Coast Air Quality's Lead Acid Battery Recycling Facility Rule

In developing guidance for conducting a RACM/RACT analysis for the 2008 Pb NAAQS, EPA drew heavily upon California's South Coast Air Quality Management District (SCAQMD) rule 1420.1, which aims to control lead and arsenic emissions from large lead-acid battery recycling facilities. The SCAQMD rule was adopted prior to the publication of EPA's guidance document, and is in most cases, more stringent than what's federally required. Considering that SCAQMD rule 1420.1 applies to sources within the secondary lead smelter category, EPA used it for developing suggested RACM for the secondary lead smelter source category.

Because there are only three primary copper smelters in the U.S., RACM was not explicitly developed in EPA's guidance. Therefore, ADEQ drew upon EPA's suggestions for the secondary lead smelter category, a source that has somewhat similar emission points and processes to copper smelters. It should be noted again that rule 1420.1 was developed to comply with NESHAPs for secondary lead smelters, while ASARCO is required to comply with NESHAPs for primary copper smelters. Therefore, some requirements between the ASARCO rule and the South Coast rule differ. The requirements from SCAQMD's rule that are similar to the Hayden Pb dust rule are compared and evaluated in Table 4-8 below.

Table 4-8 Comparison &amp; Evaluation of Pb Dust Rule to SCAQMD's Rule 1420.1

| (SELECTED) DEFINITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| R18-2-B1301.01 Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Rule 1420.1: South Coast AQMD, CA                                                                                                                                                                                                                                                                        | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                        |
| " <i>High wind event</i> " means any period of time beginning when the average wind speed, as measured at a meteorological station maintained by the owner or operator that is approved by the Department, is greater than or equal to 15 miles per hour over a 15 minute period, and ending when the average wind speed, as measured at the approved meteorological station maintained by the owner or operator, falls below 15 miles per hour over a 15 minute period." | No similar requirement.                                                                                                                                                                                                                                                                                  | Suggests RACM. While the South Coast rule does not have a high wind requirement for dust sources, the Hayden Pb dust rule definition is consistent with the Imperial County definition in Table 4-7.                                                                                                                                                                                                                             |
| " <i>Lead-bearing fugitive dust</i> " means uncaptured and/or uncontrolled particulate matter containing lead that is entrained in the ambient air and is caused by activities, including, but not limited to, the movement of soil, vehicles, equipment, and wind.                                                                                                                                                                                                       | See section (c), which defines "fugitive lead-dust" as: "any solid particulate matter containing lead that is in contact with ambient air and has the potential to become airborne."                                                                                                                     | Meets RACM. Both definitions describe Pb dust as being airborne/entrained, containing Pb, and in the form of particulate matter.                                                                                                                                                                                                                                                                                                 |
| " <i>Material pile</i> " means material, including concentrate, uncrushed reverts, crushed reverts, and bedding material, that is stored in a pile outside a building or warehouse and is capable of producing lead-bearing fugitive dust.                                                                                                                                                                                                                                | No similar requirement.                                                                                                                                                                                                                                                                                  | Meets RACM. While South Coast rule does not have a definition, the Hayden Pb dust rule conforms to other PM <sub>10</sub> rule definitions (see Table 4-7).                                                                                                                                                                                                                                                                      |
| " <i>Non-smelting process sources</i> " means sources of lead-bearing fugitive dust that are not part of the hot metal process, which includes smelting in the INCO flash furnace, converting, and anode refining and casting. Non-smelting process sources include storage, handling, and unloading of concentrate, uncrushed reverts, crushed reverts, and bedding material; acid plant scrubber blowdown solids; and paved and unpaved roads.                          | A somewhat similar definition for "process" in subsection (c), which is: "using lead or lead-containing materials in any operation including, but not limited to, the charging of lead-containing materials to smelting furnaces, lead refining and casting operations, and lead-acid battery breaking." | Suggests RACM. The South Coast rule does not have a definition for those sources of fugitive Pb dust. However, the definition for "process" in the South Coast rule is somewhat similar to the Hayden Pb dust rule, in that it applies to lead-containing materials from battery breaking, which is a source of fugitive dust. This consistency between definitions suggests that the Hayden Pb dust rule definition meets RACM. |

| (SELECTED) DEFINITIONS                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                   |
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| R18-2-B1301.01 Definition                                                                                                                                                                                                                                                                                                                                               | Rule 1420.1: South Coast AQMD, CA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                         |
| <p><i>"Storage and handling"</i> means all activities associated with the handling and storage of materials that take place at the Hayden Smelter, including, but not limited to, stockpiling, transport on conveyor belts, transport or storage in rail cars, crushing and milling, arrival and handling of offsite concentrate, bedding, and handling of reverts.</p> | <p>See section (c), which defines "materials storage and handling area" as: "any area of a large lead-acid battery recycling facility in which lead-containing materials including, but not limited to, broken battery components, reverberatory furnace slag, flue dust, and dross, are stored or handled between process steps. Areas may include, but are not limited to, locations in which materials are stored in piles, bins, or tubs, and areas in which material is prepared for charging to a smelting furnace."</p> | <p>Suggests RACM. While the definitions differ and apply in different ways (i.e. storage and handling vs. storage and handling <i>areas</i>), the rules are generally consistent. Both address applicable sources of Pb dust as well as the storage and preparation/handling of such sources.</p> |
| <p><i>"Trackout/carry-out"</i> means any materials that adhere to and agglomerate on the surfaces of motor vehicles, haul trucks, and/or equipment (including tires) and that may then fall onto the road.</p>                                                                                                                                                          | <p>No similar requirement.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Meets RACM. While the South Coast rule does not have a requirement or definition for trackout/carry-out, the Hayden Pb dust rule definition meets RACM based on the comparison to PM<sub>10</sub> rules (see Table 4-7).</p>                                                                   |

| PAVED ROADS                                                                                                                                                                                                                     |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                                      | Rule 1420.1: South Coast AQMD, CA                                                                                                                                                      | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Clean roads at least once daily with a sweeper, vacuum, or wet broom in accordance with manufacturer recommendations. SPR 97168, Condition IV.B.3 adds the requirement for the owner/operator to sweep paved roads twice daily. | See subsection (h)(9)(A), which requires vacuum sweeping of paved areas subject to vehicular or foot traffic three times per day.                                                      | Meets RACM. Subsection (D)(9) in the Hayden rule requires the frequency of cleaning that gets the Hayden NAA into attainment, as evident in the modeling. South Coast's cleaning frequency for large lead-acid battery recycling facilities is more stringent than what is required under NESHAPs for secondary lead smelters, which requires paved roads to be clean twice per day (see 40 CFR Part 63, Subpart X). However, no cleaning frequency is required under NESHAPs for primary copper smelters, such as ASARCO's Hayden Operations. Therefore, the rules once per day requirement meets RACM considering it is cost-effective and minimizes emissions to bring the area into attainment. |
| Rapidly clean up track-out and carry out on paved roads that extends a cumulative distance of 50 linear feet or more; clean all other trackout and carry out at the end of the workday.                                         | See subsection (h)(9)(B), which requires vacuum sweeping immediately, no later than one hour after any maintenance activity or event that results in deposition of fugitive lead-dust. | Meets RACM. The Hayden rule requires similar rapid clean-up in subsection (D)(9)(c). Any trackout or carry-out on paved roads must be cleaned up "as expeditiously as practicable" and at the end of the workday. While the Hayden rule does not have a time limit similar to South Coast's rule, the Hayden rule is consistent with similar PM <sub>10</sub> rules in other Southwest states (see Table 4-7).                                                                                                                                                                                                                                                                                      |
| Speed limit of 15 mph with signs posted.                                                                                                                                                                                        | See subsection (h)(11) which requires a plant-wide speed limit of 5 mph.                                                                                                               | Meets RACM. The Hayden rule, subsection (D)(9), requires a speed limit for paved roads, which is consistent with other PM <sub>10</sub> rules (see Table 4-7). While South Coast's plant-wide speed limit is lower than the Hayden rule, this would not be practical at ASARCO's Hayden Operations, where not all paved roads have the same traffic and operations, and thus vehicle speeds vary. The 15-mph speed limit was factored into the Pb emissions calculations and used to demonstrate attainment.                                                                                                                                                                                        |

| UNPAVED ROADS                                                                                                                                                            |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| R18-2-B1301.01 Requirement                                                                                                                                               | Rule 1420.1: South Coast AQMD, CA                                                                                                                | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Chemical dust suppression application schedule for high-leaded unpaved roads, including slag hauler road, secondary crusher road, and reverts crushing operations roads. | Requires that all facility grounds to be encapsulated (paved, with concrete, asphalt, as approved by Executive Director). See subsection (h)(4). | Meets RACM. The Hayden rule, subsection (D)(10), is focused on unpaved roads that have the highest Pb content. While South Coast's rule requires that all facility grounds to be encapsulated, this requirement is consistent with NESHAPs for secondary lead smelters (see 40 CFR Part 63, Subpart X), and no such requirement exists under NESHAPs for primary copper smelters (see 40 CFR Part 63, Subpart QQ). Furthermore, the control efficiency achieved through the application of chemical dust suppression was used in the modeling to demonstrate attainment. |
| 20 percent opacity limit, silt loading limit of 0.33 oz/ft <sup>2</sup> , and silt content limit of 6 percent.                                                           | No requirement.                                                                                                                                  | Meets RACM. As demonstrated in Table 4-7, the unpaved road stabilization requirements in the Hayden rule, subsection (D)(10)(c), are consistent with other states' PM <sub>10</sub> rule requirements for unpaved roads. It is assumed that South Coast has no such requirement considering the rule complies with NESHAPs for secondary lead smelters, which requires all areas subject to vehicle traffic to be encapsulated (i.e. paved).                                                                                                                             |
| Maintain back-up watering trucks and personnel for visible emissions control.                                                                                            | No requirement.                                                                                                                                  | Meets RACM. The Hayden rule, subsection (D)(10)(d), requires a protective measure should any visible emissions arise from treated unpaved roads. As shown in Table 4-7, other states' PM <sub>10</sub> rule requirements for unpaved roads do not require such back-up measures. It is assumed that South Coast has no such requirement considering the rule complies with NESHAPs for secondary lead smelters, which requires all areas subject to vehicle traffic to be encapsulated (i.e. paved).                                                                     |
| Immediate, but no later than 30 minutes after observation, application of water or chemical dust suppressant where visible emissions are observed.                       | No requirement.                                                                                                                                  | Meets RACM. The Hayden rule, subsection (D)(10)(e), requires another protective and corrective measure should any visible emissions arise from treated unpaved roads. As shown in Table 4-7, other states' PM <sub>10</sub> rule requirements for unpaved roads do not require such corrective measures. It is assumed that South Coast has no such requirement considering the rule complies with NESHAPs for secondary lead smelters, which requires all areas subject to vehicle traffic to be encapsulated (i.e. paved).                                             |
| Reapplication of chemical dust suppressants within 24 hours of discovery of breakdown.                                                                                   | No requirement.                                                                                                                                  | Meets RACM. The Hayden rule, subsection (D)(10)(f), requires an additional corrective action should any portion of treated unpaved road break down and be susceptible to dust emissions. As shown in Table 4-7, other states' PM <sub>10</sub> rule requirements for unpaved roads do not require such corrective measures. It is assumed that South Coast has no such requirement considering the rule complies with NESHAPs for secondary lead smelters, which requires all areas subject to vehicle traffic to be encapsulated (i.e. paved).                          |

| UNPAVED ROADS                                                |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| R18-2-B1301.01 Requirement                                   | Rule 1420.1: South Coast AQMD, CA                                        | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Collection and prevention of runoff and/or sweeping material | No requirement.                                                          | Meets RACM. The Hayden rule, subsection (D)(10)(g), requires a protective measure against re-entrainment of Pb dust from runoff or sweeping materials on unpaved roads. As shown in Table 4-7, other states' PM <sub>10</sub> rule requirements for unpaved roads do not require such protective measures. It is assumed that South Coast has no such requirement considering the rule complies with NESHAPs for secondary lead smelters, which requires all areas subject to vehicle traffic to be encapsulated (i.e. paved).                                                                                                                                                                                                                                                                                         |
| Speed limit of 15 mph with posted signs.                     | See subsection (h)(11) which requires a plant-wide speed limit of 5 mph. | Appears to generally meet RACM. The Hayden rule requires the same speed limit for unpaved roads as paved roads. While South Coast's plant-wide speed limit is lower than the Hayden rule, this would not be practical at ASARCO's Hayden Operations, where not all unpaved roads have the same traffic and operations (i.e. slag hauler versus general plant traffic), and thus vehicle speeds vary. The 15 mph speed limit for unpaved roads is consistent with paved roads, which essentially provides a restrictive limit for all roads with high leaded dust content. Furthermore, the Hayden rule says the speed limit shall not "exceed 15 mph," which will allow ASARCO to operate at speeds lower than 15 mph. The speed limit of 15 mph is also consistent with other PM <sub>10</sub> rules (see Table 4-7). |

| STORAGE PILES                                                                                                       |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| R18-2-B1301.01 Requirement                                                                                          | Rule 1420.1: South Coast AQMD, CA                                                                                                                                                                                                                                                                                     | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Water sprays with a 10 percent surface moisture requirement for concentrate, crushed reverts, and bedding material. | Requires total enclosures for battery breaking areas, materials storage and handling areas, and dryer and dryer areas. Emissions from total enclosures are then vented to a lead emission control device. A sealed, leak-proof container is required for sources not stored in a total enclosure. See subsection (e). | Meets RACM. While South Coast's rule matches the requirements for NESHAPs for secondary lead smelters, ASARCO will be installing MACT measures under NESHAPs for primary copper smelters. Under NESHAPs for primary copper smelters, storage pile control measures include wind fences and water suppression. Therefore, the Hayden rule meets applicable MACT requirements and thus qualifies as RACT (see subsections (D)(11)-(D)(14).                                                                 |
| Wind fences for concentrate, uncrushed reverts, crushed reverts, and bedding material.                              | Requires total enclosures for battery breaking areas, materials storage and handling areas, and dryer and dryer areas. Emissions from total enclosures are then vented to a lead emission control device. A sealed, leak-proof container is required for sources not stored in a total enclosure. See subsection (e). | Meets RACM. While South Coast's rule matches the requirements for NESHAPs for secondary lead smelters, ASARCO installed MACT measures under NESHAPs for primary copper smelters. Under NESHAPs for primary copper smelters, storage pile control measures include wind fences and water suppression. Therefore, the Hayden rule meets applicable MACT requirements and thus qualifies as RACT (see subsections (D)(11)-(D)(14). Furthermore, the use of wind fences helps bring the NAA into attainment. |
| Concrete pads for concentrate and crushed reverts.                                                                  | Requires total enclosures for battery breaking areas, materials storage and handling areas, and dryer and dryer areas. Emissions from total enclosures are then vented to a lead emission control device. A sealed, leak-proof container is required for sources not stored in a total enclosure. See subsection (e). | Suggests RACM. While South Coast's rule matches the requirements for NESHAPs for secondary lead smelters, ASARCO is required to install MACT measures under NESHAPs for primary copper smelters. As shown in Table 4-7, no other states' PM <sub>10</sub> rules require concrete pads. Therefore, the addition of concrete pads for these sources provide further protection when paired with wind fences and water sprays (see subsections (D)(11) and (D)(13).                                         |

| STORAGE PILES                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Rule 1420.1: South Coast AQMD, CA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Dry acid plant scrubber blowdown solids only in an enclosed system that uses a venturi scrubber, thickener, filter press, and electric dryer that is maintained under negative pressure. The negative pressure of the electric dryer enclosure is maintained using a 2,500 ACFM dryer ventilation fan to be used at all times the electric dryer is operational. Monitoring of the negative pressure is demonstrated through the run and stop states of ventilation fan and electric dryer. | Requires total enclosures for battery breaking areas, materials storage and handling areas, and dryer and dryer areas. Emissions from total enclosures are then vented to a lead emission control device. A sealed, leak-proof container is required for sources not stored in a total enclosure. Ventilation of a total enclosure at any opening must be maintained at a negative pressure of at least 0.02 mm of Hg (0.011 inches of H <sub>2</sub> O) measured using a digital differential pressure monitoring system. See subsection (e). | Meets RACM. ASARCO's use of a total enclosure system for drying acid plant scrubber blowdown solids is consistent with South Coast's use of total enclosures for materials storage sources, which is required MACT under NESHAPs for secondary lead smelters (see 40 CFR 63.544). No total enclosure requirements exist for ASARCO's source category, primary copper smelters, under NESHAPs. Therefore, this Hayden rule requirement is more stringent and meets RACM (see subsection (D)(15). |

| AMBIENT AIR MONITORING                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                     | Rule 1420.1: South Coast AQMD, CA                                                                                                                                                                                                                                 | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Minimum four sampling sites required.                                                                                                                                                                                                                                                          | Minimum four sampling sites required, as approved by Executive Director. See subsection (j).                                                                                                                                                                      | Meets RACM. The Hayden rule, subsection (F), is consistent with the South Coast rule.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Lead samples must be collected continuously at all sites, with 24-hour filters placed and collected at minimum, every 6 calendar days.                                                                                                                                                         | Lead samples must be collected daily as 24-hour, midnight-to-midnight samples at all sites. See subsection (j).                                                                                                                                                   | Meets RACM. South Coast's rule is more stringent than the NAAQS and federal requirements. The Hayden rule is consistent with federal ambient air monitoring requirements for Pb in 40 CFR 58.12.                                                                                                                                                                                                                                                                                                                                  |
| Submit samples to a certified lab within 18 days after a filter's removal. The lab must then submit analysis/results to owner or operator within 21 days from lab's receipt of samples. The owner or operator must calculate and record within 14 days of results ambient lead concentrations. | Submit samples to SCAQMD-approved lab within 3 calendar days of collection and calculate ambient lead concentrations for individual 24-hour samples within 15 calendar days of the end of the calendar month in which samples were collected. See subsection (j). | Meets RACM. The Hayden rule is consistent with requirements set forth in the EPA/ASARCO Consent Decree and laboratory analysis requirements in the South Coast rule. The Hayden rule's time limits allow for more practicality for samples that are collected every 6 days, rather than South Coast's daily collection.                                                                                                                                                                                                           |
| Must retain lead samples for at least 3 years.                                                                                                                                                                                                                                                 | Must retain lead samples for 1 year. See subsection (j).                                                                                                                                                                                                          | Meets RACM. The Hayden rule requires samples to be retained longer than the South Coast rule to allow historical comparative analyses.                                                                                                                                                                                                                                                                                                                                                                                            |
| Follow the owner or operator's Quality Assurance Project Plan (QAPP) and operate monitors in accordance with 40 CFR Part 58, Appendix A.                                                                                                                                                       | Collect samples in accordance with 40 CFR Part 50, Appendix B and analyze samples in accordance with 40 CFR Part 50, Appendix G. See subsection (j).                                                                                                              | Meets RACM. The Hayden rule is consistent with requirements set forth in the EPA/ASARCO Consent Decree. ASARCO's monitors will not be used for comparison to the NAAQS, therefore, a QAPP is a reasonable requirement. Should the monitors be used for NAAQS-comparison in the future, they will have been sited and operated in accordance with quality assurance requirements in 40 CFR Part 58, Appendix A. At that time, sample analysis and collection can then follow federal requirements rather than the facility's QAPP. |
| Continuously monitor and record wind speed and direction using station approved by Department.                                                                                                                                                                                                 | Continuously record wind speed and direction using station approved by Executive Director. See subsection (j).                                                                                                                                                    | Meets RACM. The Hayden rule's meteorological monitoring requirements is consistent with South Coast's requirements.                                                                                                                                                                                                                                                                                                                                                                                                               |

| RECORDKEEPING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                            |
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| R18-2-B1301.01 Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Rule 1420.1: South Coast AQMD, CA                                                                                                                                      | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                  |
| Current and past fugitive dust plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No requirement.                                                                                                                                                        | Meets RACM. While South Coast does not require a fugitive dust plan, the Hayden rule, subsection (H), is consistent with MACT requirements under NESHAPs for primary copper smelters (see 40 CFR 63.1445).                                                                                                 |
| Physical inspection sheets, checklists, and/or log sheets.                                                                                                                                                                                                                                                                                                                                                                                                                                       | Records of inspections of control equipment (see subsection (m)(1)(C)).                                                                                                | Meets RACM. The Hayden rule, subsection (H)(1), is consistent with South Coast's recordkeeping requirements for inspections.                                                                                                                                                                               |
| All records of unpaved road stabilization and opacity tests and materials piles moisture content tests, if any.                                                                                                                                                                                                                                                                                                                                                                                  | No requirement.                                                                                                                                                        | Meets RACM. While the South Coast rule does not require an opacity limit to keep record of, or any road stabilization or moisture requirements, the Hayden rule does and such records must be retained to provide evidence of any opacity observations or soil stabilization tests. See subsection (H)(1). |
| Maintenance, inspections, quality assurance and control, samples, and wind data from ambient air and meteorological stations, in addition to records of periods where monitors are inoperative.                                                                                                                                                                                                                                                                                                  | Results of all ambient air lead monitoring and meteorological monitoring. See subsection (m)(1)(B).                                                                    | Meets RACM. The Hayden rule is consistent with recordkeeping of ambient air and meteorological samples and data requirements in the South Coast rule. See subsection (H)(1).                                                                                                                               |
| Recordkeeping system and records for fugitive dust sources, including visible emissions observations, corrective actions, water sprayer operations, chemical dust suppression application, timing of paved road cleaning, Reference Method 9 opacity readings, operating conditions, calibration records for measurement devices, and records for operational deviations. Records must also reflect who conducted the activity or observation, location/nature of activity, and dates and times. | Records of housekeeping activities, including name of person performing activity, and dates and times on which specific activities were completed. See subsection (m). | Meets RACM. The Hayden rule, subsection (H)(2), is consistent with similar recordkeeping requirements for housekeeping provisions in the South Coast rule.                                                                                                                                                 |
| Records must be maintained for 5 years and kept onsite for at least 2 years.                                                                                                                                                                                                                                                                                                                                                                                                                     | Records must be maintained for 5 years and kept onsite for at least 2 years. See subsection (m).                                                                       | Meets RACM. The records retention requirement in the Hayden rule is consistent with the South Coast rule, as well as MACT requirements under NESHAPs for both source categories.                                                                                                                           |

| REPORTING                                                                                                                                                                                                  |                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R18-2-B1301.01 Requirement                                                                                                                                                                                 | Rule 1420.1: South Coast AQMD, CA                                                                                                           | R18-2-B1301.01 Evaluation                                                                                                                                                                                                                                                                                                                            |
| Quarterly reports that include visible emissions observations, high wind event dates, corrective actions, progress on control construction, raw monitoring data and calculated ambient air concentrations. | By 15th of each month, the results of ambient air lead and wind monitoring. See subsection (n)(1).                                          | Meets RACM. South Coast's reporting is more frequent to follow the daily ambient air monitoring collection requirements in the rule, whereas the Hayden rule, subsection (l), requires the correct reporting frequency to follow the continuous ambient air monitoring requirements (i.e. a 24-hour filter being placed and collected every 6 days). |
|                                                                                                                                                                                                            | Notification and written report for any ambient air concentration exceedances.                                                              | Not applicable. The Hayden rule does not require a facility-wide ambient air concentration limit like South Coast. Instead, the Hayden rule requires an emissions limit for the main stack, consistent with the attainment modeling emission rates.                                                                                                  |
|                                                                                                                                                                                                            | Initial and ongoing facility status reports. Ongoing facility status reports must be submitted annually. See subsections (n)(3) and (n)(4). | Meets RACM. The Hayden rule, subsection (l), requires quarterly reporting, whereas the South Coast rule requires annual reporting.                                                                                                                                                                                                                   |

## 4.8 Reasonable Further Progress

### 4.8.1 Requirements

CAA Section 172(c)(2) requires that nonattainment area plans demonstrate that the area will achieve reasonable further progress (RFP) defined as an incremental reduction in emissions before the attainment date. For Pb nonattainment areas, RFP does not need to be in the form of linear reductions, but instead is achieved through demonstration of adherence to an “ambitious compliance schedule”<sup>112</sup> which is “expected to periodically yield significant emissions reductions, and as appropriate, linear progress.”<sup>113</sup>

### 4.8.2 Compliance Schedule

EPA recommends that Pb nonattainment SIPs provide a detailed schedule for compliance with RACM, including RACT, and accurately indicate the corresponding annual emission reductions to be achieved.<sup>114</sup> EPA notes that it is appropriate to expect early implementation of less technology-intensive measures, followed by more intensive controls later on. Should the area fail to implement such controls, sanctions and contingency measures would be triggered.<sup>115</sup>

Please note that the 2017 SIP control strategy generally coincides with controls in the Consent Decree, therefore, the control implementation schedule for measures included in the 2017 SIP submittal were tied to deadlines mandated by the Consent Decree (see the Control Implementation Schedule in Table 4-3). Controls for fugitive dust like wind fences began installation during 2017, and more intensive controls were implemented in 2018. The compliance date in the smelter rule (R18-2-B1301) is on the earlier of July 1, 2018, or 180 calendar days after completion of CRP improvements.<sup>116</sup> The compliance date in the Pb dust rule (R18-2-B1301.01) is December 1, 2018.<sup>117</sup>

The implementation schedule for new controls included in this 2023 SIP revision are shown in Table 4-9 below. Estimated emissions reductions attributable to implementation of each measure are included in Chapter 5 of the *Modeling Technical Support Document (TSD): Hayden Pb State Implementation Plan Revision* in Appendix B. Given the uncertainty in defining specific dates for implementation of the control measures in Table 4-9, the compliance schedule reflects and is tied to the date of smelter restart. The date of smelter restart is defined in SPR 97168 for the Hayden Smelter as the first day after permit issuance that concentrate is processed through the INCO flash furnace to produce matte. To account for

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<sup>112</sup> See 2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers, memorandum issued by Scott Mathias, U.S. EPA. (8 July 2011).

<sup>113</sup> See 73 FR 66964 (Nov. 12, 2008).

<sup>114</sup> 2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers, memorandum issued by Scott Mathias, U.S. EPA. (8 July 2011).

<sup>115</sup> See 73 FR 66964, 67038 (Nov. 12, 2008).

<sup>116</sup> Note that the compliance date is the same date as the new rule for the 2010 SO<sub>2</sub> NAAQS applicable to ASARCO (R18-2-B1302). The controls mitigating leaded smelting emissions also mitigate SO<sub>2</sub> emissions, therefore, both rules have the same compliance date. The deadlines in the Consent Decree for these controls dictated the compliance date for both the Pb and SO<sub>2</sub> rules.

<sup>117</sup> Note that the compliance date for the Pb dust rule is later than the date for the smelter rule (R18-2-B1301). This is because some fugitive dust controls, like wind fences, are being installed at a staggered schedule due to resource use, meaning cost, personnel, and current facility configuration.

optimization of the control measures, they will be considered implemented when they become effective. This is also described in Attachment I of the permit revision for the Hayden Smelter (SPR 97168).

**Table 4-9 Control Implementation Schedule for New Measures**

| Control Measure                                                                                           | Permit Condition                                                                                                                                                                                                                                                                                                                                                                                                | Implementation Schedule                              |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Implementation of Flash Furnace Area Capture Improvements (Uptake Improvement System)                     | Install additional hooding and interceptor walls (the “Uptake Improvement System”) to improve the capture of fugitive emissions from the flash furnace area, matte tapping and slag skimming areas, route them to the existing converter secondary hood baghouse for fabric filter and high surface area lime injection control, and then to the annulus of the main stack upon smelter restart.                | <b>Upon smelter restart.</b>                         |
|                                                                                                           | Establish operational ranges of the damper positions (Conditions II.A.2). Verify the positions by a stack test no later than 180 days after smelter restart.                                                                                                                                                                                                                                                    | <b>No later than 180 days after smelter restart.</b> |
|                                                                                                           | Establish a timed interlock of the slag return launder. Submit the first analysis to the Director no later than 75 days after smelter restart.                                                                                                                                                                                                                                                                  | <b>No later than 75 days after restart.</b>          |
| Implementation of Converter and Material Transfer Area Capture Improvements (Fuming Ladle Capture System) | Install a hood and interceptor walls (the “Fuming Ladle Capture System”) to provide a system for the capture of fugitive emissions from fuming ladles in the converter aisle and material transfer areas, route them to the existing converter secondary hood baghouse for fabric filter and high surface area lime injection control, and then to the annulus of the main stack each day upon smelter restart. | <b>Upon smelter restart.</b>                         |
|                                                                                                           | Develop a training program for the Fuming Ladle Capture System and train the existing employees within 90 days of smelter restart.                                                                                                                                                                                                                                                                              | <b>Within 90 days of smelter restart.</b>            |
|                                                                                                           | Conduct an initial flow test to verify that the system achieves the design flow within 180 days of smelter restart.                                                                                                                                                                                                                                                                                             | <b>Within 180 days of smelter restart.</b>           |
| Implementation of Anode Furnace Secondary Hood Capture and Control System                                 | Install secondary hoods around each of the anode furnaces to improve the capture of fugitive emissions from the anode furnaces during charging, holding and processing, route the emissions to a new anode secondary hood baghouse for fabric filter control, and then to the annulus of the main stack upon smelter restart.                                                                                   | <b>Upon smelter restart.</b>                         |
|                                                                                                           | Establish a range of damper positions and total flow conditions based upon the anode secondary hood baghouse flow monitor within 180 days of smelter restart.                                                                                                                                                                                                                                                   | <b>Within 180 days of smelter restart.</b>           |

For Pb nonattainment areas, RFP and contingency measure requirements are related. EPA recommends that the amount of emissions reduced by a contingency measure (or group of measures) should equal one year's worth of RFP emissions reductions.

Traditionally, emissions reductions contributable to contingency measures were measured in tons per year (tpy). But in areas where a single source is responsible for nonattainment, EPA thinks it reasonable to identify the amount of reductions required for contingency purposes by reference to reductions in ambient air concentrations. Considering that Pb emissions in the NAA are contributable to ASARCO's Hayden Operations, ADEQ used this ambient air concentration approach to measure contingency measure reductions. See section 4.9 below for more discussion on contingency measures.

## 4.9 Contingency Measures

### 4.9.1 Requirements

Under CAA section 172(c)(9), Pb nonattainment area plans must include contingency measures to be implemented if the area fails to meet reasonable further progress (RFP) requirements or fails to attain the NAAQS by the applicable statutory attainment date. Key requirements associated with contingency measures for Pb nonattainment areas are:<sup>118</sup>

- Contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly without significant further action by the state or Administrator.
- The SIP should contain trigger mechanisms for the contingency measures.
- The SIP should contain a schedule for implementation of the contingency measures once triggered.
- The SIP must also indicate that the selected contingency measures are not relied upon to demonstrate RFP and are not part of the overall control strategy used to demonstrate attainment.
- Contingency measures should provide SIP-creditable emission reductions generally equivalent to one year's worth of RFP.

### 4.9.2 Required Reduction

As noted above, a contingency measure, or group of measures, must reduce emissions equal to or greater than the annual average reduction required to meet RFP goals. Annual average RFP is calculated by subtracting attainment year emissions from base year emissions and then dividing that amount by the number of years between the attainment and base years. The basic formula is:

$$\text{Annual average RFP} = (\text{Attainment level emissions} - \text{base year emissions}) \div \text{the number of years between the base year and attainment year}$$

EPA guidance recommends using the year of designation as the base year and the attainment year for calculating the amount of emissions reduction necessary for contingency measures.<sup>119</sup> Although the

<sup>118</sup> See 83 FR 31087 (July 3, 2018) and 73 FR 66964 (November 12, 2008).

<sup>119</sup> See Memorandum, 2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers at page 3, July 8, 2011, Scott L. Mathias, Interim Director Air Quality Policy Division, U.S. Environmental Protection Agency.

Hayden area was designated nonattainment in 2014, EPA used ambient air monitoring data from 2012 to make the designation. Therefore, in the 2017 SIP, ADEQ used 2012 as the base year in the calculation to coincide with the monitoring data EPA used for designation and 2019 as the required attainment year.

As a result of EPA's January 31, 2022 determination that the area failed to attain the 2008 Pb standards by the October 3, 2019 attainment date, ADEQ is required to develop a new SIP revision including revised demonstrations for RFP necessary to show attainment of the Pb NAAQS by the new attainment date of January 31, 2027.<sup>120</sup>

EPA guidance explains that, *"traditionally the amount of reductions required for contingency measures has been measured in terms of tpy (tons per year) reductions at a source. However, where a single source is responsible for nonattainment, it may be possible to identify the amount of reductions required by reference to reductions in ambient air concentrations [monitored and modeled concentrations] ... EPA would need to evaluate the approvability of such an approach on a case-by-case basis based on the sources within the nonattainment area, the modeling used, and available control measures."*<sup>121</sup> Since one source contributes the majority of Pb emissions in the Hayden NAA, ADEQ estimated contingency measure reductions using ambient air concentrations.

The same formula for calculating emissions reductions in tpy applies to concentrations. For the Hayden NAA, ADEQ calculated annual average RFP using the following equation:

$$\text{Annual Average RFP} = (2026 \text{ modeled concentration} - 2017 \text{ highest monitored rolling 3-month concentration}) / 9 \text{ years}$$

Because the necessary reduction is being measured in ambient air concentrations, ADEQ selected 2017 as the base year. This supports the requirement for relevant data as 2017 contains the most excursions above the level of the Pb NAAQS in recent years. Additionally, 2017 was the last year of normal operations at the ASARCO Hayden Smelter. During years 2018-2021 there were several shutdowns resulting in decreased or complete stoppage of production.

The highest monitored rolling 3-month concentration for 2017 was used, considering that in one year, there are actually 12 rolling three-month averages (one for each month). Using the highest recorded rolling 3-month concentration provides a more conservative approach rather than averaging the concentrations.

The annual average RFP is calculated below:

$$-0.016 \mu\text{g}/\text{m}^3 \text{ (Annual Average RFP)} = (0.134 \mu\text{g}/\text{m}^3 \text{ (2026 modeled concentration)} - 0.28 \mu\text{g}/\text{m}^3 \text{ (highest rolling 3-month monitored concentration in 2017 highest monitored concentration)}) / 9 \text{ years}$$

Therefore, contingency measures for the Hayden nonattainment area must reduce ambient Pb concentrations by  $-0.016 \mu\text{g}/\text{m}^3$  when triggered.

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<sup>120</sup> See 87 FR 4805 (January 31, 2022).

<sup>121</sup> See Memorandum, 2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers at page 3, July 8, 2011, Scott L. Mathias, Interim Director Air Quality Policy Division, U.S. Environmental Protection Agency.

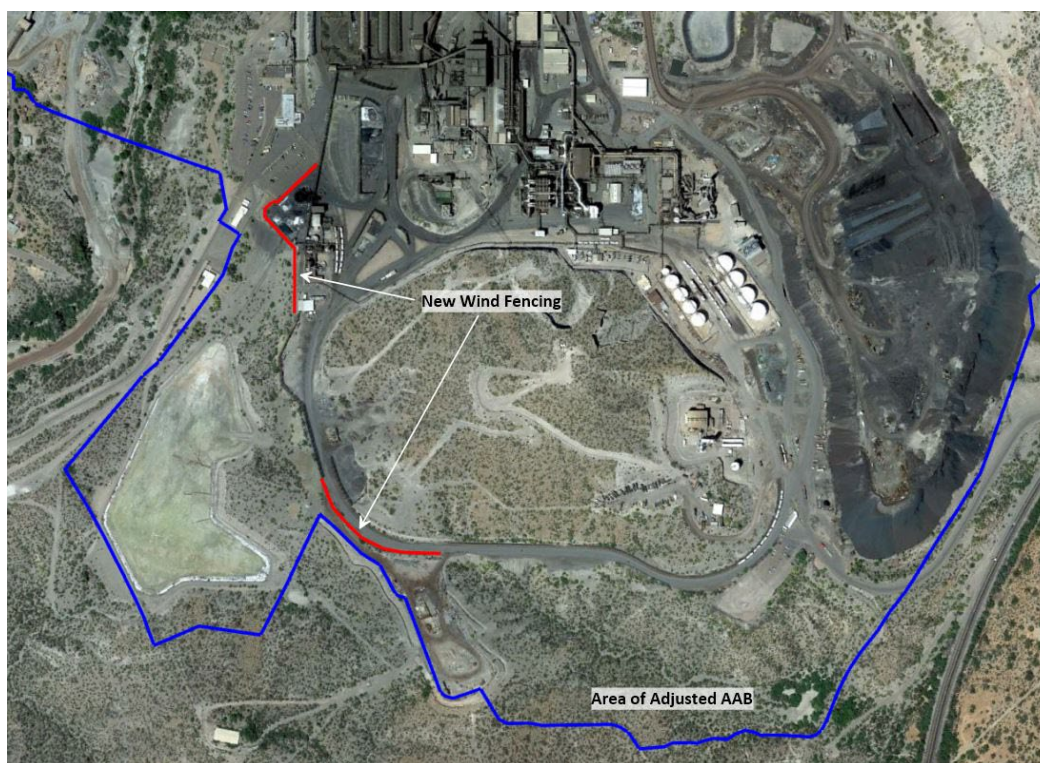
### 4.9.3 Selected Measures

The contingency measure selected consists of wind fencing on the north side of the filter plant and along the south side of the main haul road. The new wind fencing is indicated in red in Figure 3-3 below. The wind fencing provides control on possible windblown or reentrained dust from filter plant material handling and primary haul road emissions, including possible lead-bearing dust, that may be found in these areas. Wind fencing has been found to be an effective control at other areas of the Hayden smelter. ASARCO is also required to expand the southern perimeter fence further south toward the chlorinator facility. This expansion lessens the likelihood of inadvertent exposure of the general public to possible lead-contaminated dusts reentrained from the southern haul road.

To model the revised emissions for the addition of the wind fencing and expansion of the perimeter fencing as shown in Figure 3-3, ASARCO revised the attainment model emission inventory to add 75% control of windblown or reentrained dust for the wind fence along only those segments of roadway immediately adjacent to the proposed wind fences and revised the southern ambient air boundary to reflect the new fencing boundary. The 75 percent control factor was developed during the EPA consent decree negotiations and appears consistent with observed performance of wind fences at other locations in the Hayden smelter at reducing wind velocities and associated reentrainment of dust particles.

The AA S design value for the attainment modeling is  $\mu\text{g}/\text{m}^3$ . The NAAQS design value after implementation of the proposed contingency measures is  $\mu\text{g}/\text{m}^3$ . The difference between the two concentrations is  $\mu\text{g}/\text{m}^3$ , which is more than the required reduction needed for contingency purposes (which is  $\mu\text{g}/\text{m}^3$ ). Therefore, the addition of the wind and perimeter fencing achieves the required reduction needed to protect RFP and attainment.

**Figure 3-3 Contingency Measure Wind Fencing**



See Section 5.2 of the *Modeling Technical Support Document (TSD): Hayden Pb State Implementation Plan Revision*, provided in Appendix B, for additional discussion of wind fencing as well as a proposed precautionary expansion of the southern perimeter fencing to reduce the likelihood of exposure in this area.

The contingency measure is triggered upon the occurrence of any of the following:

- Failure to meet RFP, is failure to meet the compliance schedule that represents RFP (Table 4-9 of this document). Given the uncertainty in defining specific dates for implementation of the control measures in Table 4-9, the compliance schedule reflects and is tied to the date of smelter restart. The date of smelter restart is defined in SPR# 97168 for the Hayden Smelter as the first day after permit issuance that concentrate is processed through the INCO flash furnace to produce matte.
- Failure to attain the NAAQS by the statutory attainment date. Violating the permit effective dates for installation of controls would subject ASARCO to penalties. The contingency measure must be implemented within 60 days of notification by EPA Region 9 of such failure. These triggers, 60-day timeframe, as well as the actual contingency measure, are incorporated into the significant permit revision which serves as the regulatory text for this implementation plan revision, consistent with EPA guidance, which states that contingency measures should take effect “without further action by the state or the Administrator.” EPA interprets this requirement to mean that no further rulemaking by the state, or EPA, would be needed to implement the contingency measures. By having the contingency measures already in the permit, there is no further action needed to implement the fencing project. ADEQ will ensure that the measures are fully implemented within the relevant timeframes.

The fencing project is also a practical contingency measure, as ASARCO is already operating other wind fences, which have been shown to be effective, as part of the 2017 SIP and consent decree. The location of the fencing is specifically targeted at areas where ASARCO expects that reentrainment may occur and for which control would be important to achieve attainment.

## 5 Attainment Demonstration

On January 31, 2022 EPA determined the Hayden NAA failed to attain the 2008 Pb NAAQS by the applicable attainment date of October 3, 2019.<sup>122</sup> As a result of this determination, ADEQ is preparing a new SIP revision, which will include an updated model attainment demonstration. ADEQ conducted air quality modeling for the Hayden NAA to demonstrate attainment of the 2008 Pb NAAQS by 2026. Air quality modeling is conducted to show that the control measures, emission limits, and rules that will be implemented at the air pollution source(s) are adequate to provide for attainment and maintenance of the applicable NAAQS. The adequacy of control strategies is demonstrated by means of air quality models, databases, and other requirements specified in the Guideline on Air Quality Models in 40 CFR Part 51, Appendix W.<sup>123</sup> The modeling demonstration contains a summary of maximum air quality concentrations expected to result from implementation of the control strategy,<sup>124</sup> as well as a presentation of emission levels expected to result from implementation of each control measure.<sup>125</sup>

Modeling for the Hayden Pb NAA was performed in accordance with the EPA's Guideline on Air Quality Models (GAQM). Additionally, ADEQ referred to the *"2008 Lead (Pb) National Ambient Air Quality Standards (NAAQS) Implementation Questions and Answers"* guidance document.

This chapter provides an overview of the methodologies and results from the modeling conducted to demonstrate that the control strategy for this SIP will bring the Hayden Pb NAA into attainment. More information can be found in the Attainment Modeling Technical Support Document (Modeling TSD) in Appendix B.

### 5.1 Modeling Demonstration Overview

There are many types of air quality modeling, and the type is selected based on the characteristics of the pollutant being modeled. Dispersion modeling is EPA's preferred type for modeling Pb. In general, dispersion modeling uses mathematical formulations to characterize the atmospheric processes that disperse a pollutant emitted by a source. A dispersion model uses emission rates and meteorological inputs to predict ambient air concentrations. These air concentrations are modeled at specific locations, referred to as receptors, within the modeled ambient air boundaries. The receptors are located in areas that are accessible to people, therefore, areas that are considered ambient air.<sup>126</sup> The ambient air concentrations at these receptors and in the area as a whole determines attainment of the NAAQS.

#### 5.1.1 Modeling Domain

The first step in modeling is to determine the size of the modeling domain, which depends on the number of sources to explicitly model and size of the receptor network in order to account for the areas of impact (U.S. EPA, 2014a). The modeling domain should at a minimum encompass the nonattainment area and include the sources thought most likely to cause or contribute to NAAQS violations in and around the

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<sup>122</sup> See 87 FR 4805; January 31, 2022

<sup>123</sup> See 40 CFR § 51.112.

<sup>124</sup> See 40 CFR § 51.115.

<sup>125</sup> See 40 CFR § 51.112.

<sup>126</sup> See 40 CFR § 50.1 for the legal definition of ambient air.

nonattainment area. In the modeling exercise, all modeled receptors should exhibit modeled attainment of the NAAQS.

#### 5.1.1.1 Modeled Emission Sources

ADEQ's Emissions Inventory (EI) for the Hayden Pb NAA includes point and area sources. The point source category contributes 99 percent of the Pb emissions in the NAA. Moreover, the only facility in this category is the ASARCO Hayden Copper Smelter. Due to this inventory make up, ADEQ focused its contributing sources analysis on the aforementioned facility.

At the ASARCO facility, ADEQ has determined the following processes/emissions points to be the contributors of Pb emissions:

- Main stack emissions
- Fugitive emissions from the smelting process
- Slag dumping
- Re-entrained leaded silts/material

#### 5.1.1.2 Ambient Air Boundary and Receptor Grid

The land owned by ASARCO contiguous to and including ASARCO's Hayden Operations covers an area in excess of 15 square miles. This area extends along and on either side of the Gila River Valley approximately 4-1/2 miles to the west of the plant and extends into the Dripping Spring Mountains to the north and northwest. In addition, much of the area is inaccessible to the general public, either because it is fenced or because of the steep and rugged nature of the terrain. Consequently, much of ASARCO's property is not considered ambient air. The area encompassing the actual processes and industrial activities associated with the ASARCO Hayden Operations is considerably smaller and is located immediately to the north and east of the Town of Hayden.

ASARCO followed guidance in Section 3.4.3 of ADEQ's Air Dispersion Modeling Guidelines (ADMG) about how to identify, for permitting modeling purposes, the Ambient Air Boundary (AAB), outside of which modeling receptors are to be placed. This perimeter consists of fencing and steep/rugged terrain, and what ADEQ designates as the process area boundary (PAB).

This AAB used for the Pb SIP modeling is the same as that used for the SO<sub>2</sub> SIP modeling, with one exception: the AAB used for the Pb SIP modeling encompasses an additional narrow area extending down to the crusher, near the rail loading, which is a source of fugitive dust that may contain Pb. The SO<sub>2</sub> modeling over-conservatively treated this area as ambient air, even though it is a secure part of ASARCO's property and operations at the facility. The AAB used for the Pb SIP modeling does not encompass the railcar unloading area that is located across Highway 177, even though that area too is a secure part of ASARCO's property and operations. In this respect, the Pb SIP modeling is as over-conservative as the SO<sub>2</sub> SIP modeling, which also treated that area as ambient air.

A modeling domain with a total coverage of approximately 33 kilometers by 34 kilometers, centered on the ASARCO Smelter facility was developed. The modeling domain covers portions of Gila and Pinal Counties and encompasses the entire Hayden NAA. A total of 2,932 receptors were placed in the modeling domain. Spacing of the receptors is as follows:

- Receptors along AAB at a spacing of 25 m
- Receptors between AAB 500 m and ~1500 m at a spacing of 100 m (including in area of elevated terrain to the north)
- Receptors between ~1500 m and ~5500 m at a spacing of 500 m
- Receptors between ~5500 m and Hayden Pb NAA boundary at a spacing of 1000 m
- Receptors along the Hayden Pb NAA boundary at a spacing of 2500 m.

Additional methods are discussed further in the Modeling TSD.

## 5.1.2 Model Selection & Approach

### 5.1.2.1 AERMOD

ADEQ used the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), version 22112 for the attainment demonstration. to predict ambient concentrations in simple, complex and intermediate terrain. AERMOD is the recommended sequential model in EPA's GAQM (40 CFR 51, Appendix W) (U.S. EPA, 2005) for near-field analysis.

There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET (version 22112), a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and AERMAP (version 18081), a terrain data preprocessor that incorporates complex terrain using USGS Digital Elevation Data. Other non-regulatory components of this system include: AERSURFACE (Version 200606), a surface characteristics preprocessor, and BPIPPRIM, a multi-building dimensions program incorporating the Good Engineering Practice technical procedures for PRIME applications (U.S. EPA, 2004a).

ADEQ used the regulatory default option. This option commands AERMOD to:

- Use the elevated terrain algorithms requiring input of terrain height data for receptors and emission sources;
- Use stack tip downwash (building downwash automatically overrides);
- Use the calms processing routines;
- Use buoyancy-induced dispersion; and
- Use the missing meteorological data processing routines.

### 5.1.2.2 Hybrid Modeling Approach

Situated in a low-lying portion of a valley, with mountains reaching over 4,000 feet to the north, east and southwest, the Hayden NAA is subject to a distinct mountain-valley diurnal wind pattern. Under stable atmospheric conditions, nighttime winds are typically from the southeast with speeds less than 10 miles per hour. These conditions cause air to pool in low-lying areas at night, causing pollutants within the air to settle in these areas. The up-slope air flows and convection that occur during the day increase dispersion out of the Hayden area. Under normal daytime conditions, surface winds in the Hayden area range from west-southwesterly to west-northwesterly as the atmosphere becomes less stable.

In the Hayden SO<sub>2</sub> SIP, Camera Hill meteorological (MET) data was used because it best represented MET conditions seen at the rooflines, which has the highest impact on ambient SO<sub>2</sub> concentrations. However, for the Hayden Pb SIP, a large number of sources exist near ground level, with a significant elevation difference with Camera Hill. Using the Camera Hill MET data to model these emission sources may not be

representative of the actual Pb concentrations in the modeling area. Additionally, the very complex terrain in Hayden area causes the monitoring stations to experience different wind speeds and wind directions for a given time period. Considering all these issues, the previously approved hybrid approach was used to model ASARCO's Pb emissions. In this approach two different MET data sets were used to run AERMOD. Camera Hill MET data were used to model the emissions from the main stack and roofline fugitives, and Hayden Old Jail MET data were used to model the emissions from near ground sources such as material storage and handling and road dust emissions.

ADEQ's performance evaluation of the hybrid approach is in the Modeling TSD in Appendix B.

### 5.1.2.3 LEADPOST

The NAAQS for Pb is defined as  $0.15 \mu\text{g}/\text{m}^3$  for rolling three-month averaging time. Therefore, the modeled design value is calculated as the rolling three-month average concentration at each receptor. AERMOD does not calculate the design value, so post-processing is required.

The EPA post-processor, LEADPOST, can be used to calculate the design values. LEADPOST is a FORTRAN program designed to read monthly concentration output from AERMOD or an alternative model and calculate rolling three-month averages by receptor and source group. This program was used to calculate the maximum rolling three-month average concentration for each receptor and overall maximum concentration (across all receptors and source groups).<sup>127</sup>

In the hybrid approach, AERMOD was run separately using each of the MET data sets and their associated emission sources. Post-processing files containing highest monthly concentrations were generated for each run. Post-processing files were then processed to combine the concentrations predicted at each receptor. The combined Post-processing file was then used as an input to LEADPOST to calculate the maximum rolling 3-month average concentration.

### 5.1.3 Meteorological Data

EPA's AERMET tool (version 22112) was used to process meteorological data for use with AERMOD. AERMET merges National Weather Service (NWS) surface observations with NWS upper air observations and performs calculations of meteorological parameters required by AERMOD. Surface observations from on-site instruments can optionally be included. The latter can be useful because the data are more relevant to the site being modeled and in cases where on-site data are collected at multiple elevations above ground, AERMET can construct a more accurate vertical profile of meteorological data. In addition to the meteorological observations, AERMET further requires the inclusion of the characteristics of land use surfaces that ASARCO calculated using EPA's AERSURFACE tool.

EPA recommends that AERMOD be run with a minimum of 5 years of NWS data or 1 year of on-site meteorological data. As described in Section 5.1.2, a hybrid modeling approach was used for this project. The meteorological data used in the sequential modeling consists of on-site hourly surface observations collected by ASARCO from a 10-meter tower located approximately 0.35 kilometers south of the smelter building, on Camera Hill and also on-site hourly surface observations collected by ADEQ's Hayden Old Jail 10-meter station located approximately 1.06 kilometers west of the ASARCO concentrator and smelter complexes.

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<sup>127</sup> EPA's User instructions for LEADPOST (Version 11237) program.

The Camera Hill met data were used to model the Pb emissions from the main stack and fugitive rooflines and Hayden Old Jail met data were used to model the emissions from lower elevation sources such as material storage and handling sources, paved roads, unpaved roads, etc. The meteorological data used in the modeling cover the entire 2020 calendar year, with the raw on-site data provided by ASARCO and ADEQ.

EPA's AERSURFACE tool (version 20060) was used to calculate the surface roughness length, albedo and Bowen ratio inputs required by AERMET. EPA developed AERSURFACE to identify these parameters within a defined radius from a specified point. In this case, ADEQ input the UTM coordinates of the on-site meteorological stations to AERSURFACE along with a 1-kilometer radius per EPA guidance. The modeling used land cover, tree canopy, and impervious surface information for the year 2016 as inputs to AERSURFACE. The parameters for twelve compass sectors of 30° each and by month were calculated. In original Met data processing for Hayden Pb SIP, the user-defined seasonal categories were assigned as follows per ADEQ guidance:

- Late autumn after frost and harvest, or winter with no snow: December, January, February, March;
- Winter with continuous snow on the ground: none;
- Transitional spring (partial green coverage, short annuals): April, May, June;
- Midsummer with lush vegetation: July, August, September; and
- Autumn with un-harvested cropland: October, November.

Meteorological data from the two ambient air monitors is provided in the Modeling TSD in Appendix B.

#### 5.1.4 Background Concentration

EPA requires background air quality estimates to be added to modeling results for comparison to the NAAQS. For the Hayden Pb project ADEQ determined a background concentration based on a regional monitor to be more appropriate than local monitors. This determination was based on the nature of lead emissions from the facility. The smelter has been temporarily shut down since October 2019. Therefore, the background ambient air concentration of Pb used in the modeling analysis is derived from ambient air monitoring data that were generated from November 2019 through September 2022.

Ambient air monitoring data were generated by two state and local air monitoring stations in the Hayden Pb NAA—the one at Globe Highway to the east of the slag dump along Highway 77 and the one at Hillcrest in the town of Hayden. During November 2019 through September 2020, the data from the Hillcrest monitor had higher concentrations of Pb than the data from the Globe Highway monitor. Therefore, to be conservative, BSM's modeling analysis used a background concentration of Pb that has been calculated using the data from the Hillcrest monitor.

## 5.2 Modeling Results and Emission Limits

The Pb SIP modeling was conducted by executing two separate model runs—one using the Camera Hill meteorological data (for “elevated” sources) and one using the Hayden Jail meteorological data (for “low level” sources). The results of those two runs were combined using the LEADPOST post-processor.

The results of the modeling analysis are summarized in Table 5-1 below.

**Table 5-1 Maximum Modeled Ambient Pb Concentration**

| Highest 3-Month Concentration ( $\mu\text{g}/\text{m}^3$ )                       | Background Concentration ( $\mu\text{g}/\text{m}^3$ ) | Total Concentration ( $\mu\text{g}/\text{m}^3$ ) | NAAQS ( $\mu\text{g}/\text{m}^3$ ) |
|----------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------|------------------------------------|
| 0.134 <sup>a</sup>                                                               | 0.010                                                 | 0.144                                            | 0.15                               |
| a. Highest 3-Month Concentration predicted to occur at (521358.8 m, 3651137.8 m) |                                                       |                                                  |                                    |

ADEQ's full modeling demonstration is in the Modeling TSD in Appendix B.

## 6 Anti-Backsliding Provisions

Section 110(l) of the CAA provides that EPA shall not approve a SIP revision if it interferes with attainment, reasonable further progress, or other CAA requirements:

*“Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act.”*

In addition to 110(l), CAA §193 prohibits the modification of a control, or a control requirement, in effect or required to be adopted before November 15, 1990 in any nonattainment area unless such a modification ensures equivalent or greater emission reductions:

*“Each regulation, standard, rule, notice, order and guidance promulgated or issued by the Administrator under this Act, as in effect before the date of the enactment of the Clean Air Act Amendments of 1990 shall remain in effect according to its terms, except to the extent otherwise provided under this Act, inconsistent with any provision of this Act, or revised by the Administrator. No control requirement in effect, or required to be adopted by an order, settlement agreement, or plan in effect before the date of the enactment of the Clean Air Act Amendments of 1990 in any area which is a nonattainment area for any air pollutant may be modified after such enactment in any manner unless the modification insures equivalent or greater emission reductions of such air pollutant.”*

The 2008 Pb NAAQS proposed rule<sup>128</sup> states that “any proposed SIP revision being considered by EPA after the effective date of the revised Pb NAAQS would be evaluated for its potential to interfere with attainment or maintenance of the new standard...EPA believes that any area attaining the revised Pb NAAQS would also attain the existing Pb NAAQS, and thus reviewing proposed SIP revisions for interference with the new standard will be sufficient to prevent backsliding.” Furthermore, EPA proposed to retain the existing 1978 Pb NAAQS until one year following the effective date of designations for any new or revised NAAQS, except that for current nonattainment areas, the standard would remain in effect until approval of a SIP for the new standard. EPA finalized<sup>129</sup> the proposed approach effective January 12, 2009.

No area in Arizona has ever been designated nonattainment for the 1978 Pb NAAQS.<sup>130</sup> The only area in Arizona designated nonattainment for the 2008 Pb NAAQS is Hayden. Therefore, Hayden only needs to attain the 2008 Pb NAAQS, and interference with the 1978 standards is not applicable.

The control strategies described in this SIP revision are intended to bring the Hayden area into attainment for the 2008 Pb NAAQS. The information contained in Chapters 4 and 5 evaluate the control strategies and emission reductions that will occur from implementation of the new control technology. The following sections demonstrate that this SIP revision will not interfere with the ability of the Hayden NAA to attain and maintain any other NAAQS under the CAA.

<sup>128</sup> See 73 FR 29184, 29275 (May 20, 2008).

<sup>129</sup> See 73 FR 66964 (Nov. 12, 2008).

<sup>130</sup> See 56 FR 56694 (Nov. 6, 1991).

## 6.1 Demonstrating Noninterference with Attainment of the NAAQS under CAA Section 110(l)

Title I of the CAA requires EPA to set NAAQS for those pollutants that are considered harmful to public health or the environment. Accordingly, the air quality standards are divided into two types: primary and secondary. Primary standards are designed for the protection of public health and secondary standards are intended to protect public welfare, such as decreased visibility and damage to animals, crops, vegetation, and buildings.<sup>131</sup> To date, EPA has established standards for six common air pollutants referred to as criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), ground-level ozone O<sub>3</sub>, particulate matter (PM), and sulfur dioxide (SO<sub>2</sub>). EPA is also required to periodically evaluate those standards and revise them if scientific analyses indicate new standards would be more protective of public health and welfare.

Under Clean Air Act Section 107(d), states must make recommendations and EPA must designate areas that meet (attainment), cannot be classified, or do not meet (nonattainment) new or revised NAAQS. Based on air quality data and other factors, EPA designates areas as “nonattainment” if those areas are found to violate or contribute to violations of a NAAQS. Reasonable further progress is defined in Section 171 of the CAA as “... such annual incremental reductions in emissions of the relevant air pollutant ... for the purpose of ensuring attainment of the applicable national ambient air quality standard ...”

The Hayden Pb NAA is located in both Gila and Pinal counties in which a primary copper smelter currently owned by ASARCO operates. The area is designated as attainment or unclassifiable for CO, NO<sub>2</sub>, O<sub>3</sub>, and PM<sub>2.5</sub>. The area is designated nonattainment for SO<sub>2</sub>, Pb, and PM<sub>10</sub>. Table 6-1 shows the current designation status of the area for each criteria pollutant listed in 40 CFR 81.303.<sup>132</sup>

Table 6-1 NAAQS Designations for Hayden

| Designation Status for the Hayden Planning Area |                              |                         |                                                        |
|-------------------------------------------------|------------------------------|-------------------------|--------------------------------------------------------|
| Pollutant                                       | Primary/Secondary            | Averaging Time          | Designation                                            |
| Carbon Monoxide (CO)                            | Primary (1971)               | 8-hour                  | Nonclassifiable/Attainment                             |
|                                                 |                              | 1-hour                  | Nonclassifiable/Attainment                             |
| Lead (Pb)                                       | Primary and Secondary (2008) | Rolling 3-Month Average | Nonattainment                                          |
| Nitrogen Dioxide (NO <sub>2</sub> )             | Primary (2010)               | 1-hour                  | Unclassifiable/Attainment                              |
|                                                 | Primary and Secondary (1971) | Annual                  | Cannot be classified or better than national standards |
| Ozone (O <sub>3</sub> )                         | Primary and Secondary (2015) | 8-hour                  | Unclassifiable/Attainment                              |
|                                                 | Primary and Secondary (2008) | 8-hour                  | Unclassifiable/Attainment                              |
|                                                 | Primary and Secondary (1997) | 8-hour                  | Unclassifiable/Attainment                              |
| PM <sub>2.5</sub>                               | Primary (2012)               | Annual                  | Unclassifiable/Attainment                              |
|                                                 | Primary and Secondary (2006) | 24-hour                 | Unclassifiable/Attainment                              |
|                                                 | Primary and Secondary (1997) | Annual                  | Unclassifiable/Attainment                              |
|                                                 | Primary and Secondary (1997) | 24-hour                 | Unclassifiable/Attainment                              |

<sup>131</sup> U.S. Environmental Protection Agency, <http://www.epa.gov/air/criteria.html>. Date Accessed: April 12, 2023.

<sup>132</sup> See 40 CFR 81.303, July 1, 2015 Edition.

| Designation Status for the Hayden Planning Area |                              |                |                                 |
|-------------------------------------------------|------------------------------|----------------|---------------------------------|
| Pollutant                                       | Primary/Secondary            | Averaging Time | Designation                     |
| PM <sub>10</sub>                                | Primary and Secondary (1987) | 24-hour        | Nonattainment                   |
| Sulfur Dioxide                                  | Primary (2010)               | 1-hour         | Nonattainment                   |
|                                                 | Primary (1971)               | 24-hour        | Does not meet primary standards |
|                                                 | Primary (1971)               | Annual         | Does not meet primary standards |
|                                                 | Secondary (1971)             | 3-hour         | N/A                             |

Source: 40 CFR 81.303

## 6.2 Noninterference with Attainment of the 1978 Pb NAAQS

In 1991, EPA finalized designations for the 1978 Pb NAAQS, in addition to designations for ozone, CO, and PM.<sup>133</sup> Designations became effective on January 6, 1992. In January and February 1991, EPA notified Governors of affected states that they should proceed to designate as nonattainment those areas that had recorded violations of the 1978 Pb NAAQS. States that were designated nonattainment included Alabama, Georgia, Indiana, Minnesota, Montana, but not any areas in Arizona. As stated earlier, Hayden needs to attain the 2008 Pb NAAQS and thus, interference with the 1978 Pb NAAQS is not applicable.

## 6.3 Noninterference with Attainment of the PM<sub>10</sub> NAAQS

Along with Miami, the Hayden area was originally designated as a Group I Area under the 1987 PM<sub>10</sub> NAAQS. The State was required to submit a SIP revision within nine months of promulgation of the NAAQS.<sup>134</sup>

In a 1990 clarification, the combined Hayden/Miami Group I Area was specified to include all or part of 26 contiguous townships in and around the towns of Hayden and Miami. Consistent with EPA's PM<sub>10</sub> grouping scheme, the Hayden/Miami Group I Area was designated and classified as a moderate PM<sub>10</sub> nonattainment area upon enactment of the 1990 CAA amendments.<sup>135</sup>

In September 1989 ADEQ submitted the *Final PM<sub>10</sub> State Implementation Plan for the Hayden Group I Area*. In July 1994, EPA proposed a limited approval/disapproval of the Hayden SIP. EPA proposed the limited disapproval primarily because the plan only addressed the Hayden portion of the nonattainment area. ADEQ submitted a formal petition to exclude the Miami area from the Hayden/Miami PM<sub>10</sub> Nonattainment Area in November 1994. EPA advised ADEQ that because the Miami area had recorded past exceedances of the TSP standards and had met the 1990 PM<sub>10</sub> nonattainment designation criteria, the Miami portion could not be excluded from nonattainment area status.

In July 2006, ADEQ requested that the Hayden/Miami PM<sub>10</sub> Nonattainment Area be separated into two nonattainment areas. The request was based on topographical and climatological differences between the Hayden and Miami areas (the areas are in separate airsheds) and the clean PM<sub>10</sub> air quality record in

<sup>133</sup> See 56 FR 56694 (Nov. 6, 1991).

<sup>134</sup> See 52 FR 24672 (July 1, 1987) and 52 FR 29383 (Aug. 7, 1987).

<sup>135</sup> Effective November 15, 1990.

the Miami area (no exceedances have been recorded since PM<sub>10</sub> monitoring began in 1987). On March 28, 2007 EPA concurred with ADEQ's request and the Hayden/Miami PM<sub>10</sub> Nonattainment Area was officially split into two independent nonattainment areas.<sup>136</sup> In the same action, EPA also determined that the Miami Nonattainment Area had continued to meet the PM<sub>10</sub> NAAQS and issued a clean data finding for the area. Currently, both Miami and Hayden are still designated nonattainment until ADEQ submits maintenance SIPs and redesignation requests.

Table 6-2 shows the potential PM<sub>10</sub> emissions from operations at the Hayden Smelter. The data show that potential emissions have not changed from previous years and are not anticipated to change in future years.

**Table 6-2 Potential PM<sub>10</sub> Emissions for Hayden Smelter**

| Potential PM <sub>10</sub> Emissions from Hayden Smelting Operations (tpy) |      |      |      |      |      |      |
|----------------------------------------------------------------------------|------|------|------|------|------|------|
| Facility                                                                   | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Hayden Concentrator                                                        | 197  | 197  | 197  | 197  | 197  | 197  |
| Hayden Smelter                                                             | 290  | 290  | 290  | 290  | 290  | 290  |
| Source: ADEQ Annual Emissions Data Reports                                 |      |      |      |      |      |      |

Table 6-3 shows the actual emissions of PM<sub>10</sub> at ASARCO's Hayden Concentrator and Hayden Smelter. While the potential to emit remains constant, actual emissions of PM<sub>10</sub> for the smelter and concentrator decreased between 2018 and 2021.

**Table 6-3 Actual PM<sub>10</sub> Emissions for Hayden Smelter**

| Facility PM <sub>10</sub> Actual Emissions (tons/year) |        |       |      |      |
|--------------------------------------------------------|--------|-------|------|------|
| Facility                                               | 2018   | 2019  | 2020 | 2021 |
| Hayden Concentrator                                    | 0      | 0     | 0    | 0    |
| Hayden Smelter                                         | 335.06 | 226.0 | 0.87 | 5.29 |
| Source: ADEQ Annual Emissions Data Reports             |        |       |      |      |

The area is nonattainment for PM<sub>10</sub>; however, the addition of fugitive Pb dust controls implemented by ASARCO to comply with the Consent Decree and the Hayden NAA Pb SIP will reduce dust emissions in the area. The material handling PM<sub>10</sub> emissions are subject to the fugitive controls from the 2017 Hayden Pb SIP. The evidence that those controls have been working is clean data (Pb) at the Hillcrest monitor in late 2018 and 2019. The controls being installed as part of this SIP revision will improve the capture of smelting fugitives, which will also reduce PM emissions as well. The reductions in fugitive Pb dust emissions, and thus PM emissions, achieved by the controls demonstrates noninterference with the PM<sub>10</sub> NAAQS in the Hayden area.

<sup>136</sup> See 72 FR 14422 (March 28, 2007).

## 6.4 Noninterference with Attainment of the 1971 and 2010 SO<sub>2</sub> NAAQS

The Hayden SO<sub>2</sub> Nonattainment Area was initially designated under the 1971 SO<sub>2</sub> NAAQS in March 1978 and comprised all of Gila County.<sup>137</sup> The current boundaries of the nonattainment and unclassified areas are codified at 40 CFR 81.303.

In 2006, EPA initiated a review of the air quality criteria for oxides of sulfur and the 1971 SO<sub>2</sub> primary NAAQS.<sup>138</sup> Taking into consideration available literature, technical information, and scientific recommendations, EPA proposed that the 24-hour and annual 1971 SO<sub>2</sub> NAAQS were not adequate to protect public health with a satisfactory margin of safety against respiratory problems associated with short-term SO<sub>2</sub> exposures.<sup>139</sup> On June 22, 2010 EPA promulgated the new 2010 SO<sub>2</sub> NAAQS establishing a new short-term primary standard with a 1-hour (daily maximum) averaging time and a form defined as the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum concentrations, and a level of 75 ppb.<sup>140</sup> In the same action, EPA also revoked the 1971 24-hour and annual standards recognizing that a 1-hour standard set at 75 ppb will have the effect of generally maintaining 24-hour and annual SO<sub>2</sub> concentrations well below the levels of the 1971 24-hour and annual standards.

In the 2010 SO<sub>2</sub> NAAQS final rule, EPA determined that the 1971 24-hour and annual primary standard will remain in effect for at least one year following the effective date of the initial area designations before being revoked under 40 CFR 50.4(e). For any SO<sub>2</sub> areas with EPA-approved attainment and maintenance SIPs for the 1971 SO<sub>2</sub> NAAQS, all provisions in the SIPs need to continue to be implemented until they are subsumed by any new EPA-approved SIPs for the 2010 SO<sub>2</sub> NAAQS. This would ensure that both the new nonattainment NSR requirements and the general conformity requirements for a revised standard are in place so that there will be no gap in the public health protections provided by these two programs. It will also ensure that all nonattainment areas under the current NAAQS and all areas for which SIP calls have been issued would continue to be protected by currently required control measures.

The final regulations also stipulate that the 1971 SO<sub>2</sub> NAAQS shall remain in place for nonattainment areas not satisfying the requirements for a SIP call under the prior NAAQS. The 1971 SO<sub>2</sub> NAAQS will be revoked only after an air agency submits a SIP providing for attainment of the 2010 SO<sub>2</sub> NAAQS and it is approved by EPA.

ADEQ submitted to EPA the Hayden SO<sub>2</sub> Nonattainment Area State Implementation and Maintenance Plan for the 1971 SO<sub>2</sub> NAAQS in June 2002. EPA has not acted on the June 2002 submittal. Per EPA's guidance, the 1971 standard will not be revoked until the SIP revision for the 2010 SO<sub>2</sub> NAAQS is submitted to and is approved by EPA. Therefore, the state is required to continue to implement provisions of the 2002 Hayden SO<sub>2</sub> SIP. When the 24-hour and annual SO<sub>2</sub> standards are officially revoked, all statutory requirements related to future state submission regarding the 1971 SO<sub>2</sub> standards under CAA Sections 110, 172, 175A, 191 and 192 no longer apply. This includes any remaining requirements for the submittal of second 10-year maintenance plan required under CAA Section 175A.

ADEQ submitted the *Arizona State Implementation Plan Revision: Hayden Sulfur Dioxide Nonattainment Area for the 2010 SO<sub>2</sub> NAAQS* and accompanying rules to EPA on March 8, 2017. On January 31, 2022, EPA

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<sup>137</sup> See 43 FR 8968 (March 3, 1978).

<sup>138</sup> See 71 FR 28023 (May 15, 2006).

<sup>139</sup> See 75 FR 35520 (June 22, 2010).

<sup>140</sup> *Id.*

published in the federal register the agency’s findings that the Hayden Nonattainment Area failed to attain the 2010 1-hour SO<sub>2</sub> primary NAAQS by the applicable attainment date of October 4, 2018.

In March 2023 ADEQ submitted to EPA the draft *Arizona State Implementation Plan Revision: Hayden Sulfur Dioxide Nonattainment Area for the 2010 SO<sub>2</sub> NAAQS*. The attainment demonstration summarized in Chapter 5 of that draft revision and provided in Appendix C of that same revision show that the emission limit established for the Hayden Smelter will allow the area to attain the 2010 SO<sub>2</sub> NAAQS. Given the area will attain the new standard, which is more stringent than the previous standard, the control measures in this SIP revision addresses all outstanding requirements for the 1971 SO<sub>2</sub> NAAQS.

Furthermore, the control equipment part of the SO<sub>2</sub> SIP is the same equipment used in this Pb SIP’s control strategy. The purpose of the control measures is to reduce emissions of SO<sub>2</sub>, Pb, and leaded-PM<sub>10</sub>. Given that the modeling for the 2010 SO<sub>2</sub> SIP shows attainment, implementation of the controls for Pb will not interfere with attainment of the 2010 SO<sub>2</sub> NAAQS.

## 6.5 Noninterference with Attainment of the CO, NO<sub>2</sub>, PM<sub>2.5</sub>, and Ozone NAAQS

The Hayden planning area is designated as attainment or unclassifiable for NO<sub>2</sub>, CO, PM<sub>2.5</sub>, and ozone (O<sub>3</sub>).

Table 6-4 shows the potential emissions for NO<sub>x</sub>, CO, and volatile organic compounds (VOCs). These estimates are for 2017 SIP controls. Post-control emissions from implementation of the 2017 SIP are expected to decrease or remain the same as current levels. New Pb controls included in the 2023 SIP are not expected to increase emissions of these pollutants. Given that the area is attainment/unclassifiable for NO<sub>2</sub> and CO, it is unlikely that the controls will interfere with those NAAQS in the Hayden area.

**Table 6-4 Potential Emissions of NO<sub>x</sub>, CO, VOCs**

| Potential Emissions (in tons per year)                                                                                                                                                                                        |                                   |                                        |                            |                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------|----------------------------|--------------------|
| Pollutant                                                                                                                                                                                                                     | Current Potential Emissions (tpy) | Post-Control Potential Emissions (tpy) | Emissions Difference (tpy) | Percent Difference |
| NO <sub>x</sub>                                                                                                                                                                                                               | 31.3                              | 31.2                                   | -0.1                       | -47.8              |
| CO                                                                                                                                                                                                                            | 26.3                              | 26.2                                   | -0.1                       | -2.4               |
| VOC                                                                                                                                                                                                                           | 1.7                               | 1.7                                    | 0                          | 0                  |
| Source: Arizona Department of Environmental Quality (2016). Technical Review and Evaluation of Application for Air Quality Significant Permit Revision No. 60647 to Operating Permit No. 1000042, ASARCO LLC – Hayden Smelter |                                   |                                        |                            |                    |

The primary constituents of O<sub>3</sub> (NO<sub>x</sub> and VOC) are projected to decrease slightly or remain constant. Based on the recommendation of attainment/unclassifiable for NO<sub>x</sub>, CO, and VOCs, the reductions in potential emissions achieved by the new control technology will result in noninterference with the O<sub>3</sub> NAAQS in the Hayden area. The control technology will also assist in capturing PM<sub>2.5</sub> emissions. Considering the area is attaining the PM<sub>2.5</sub> NAAQS, interference with continued attainment is not expected.

## 6.6 Noninterference with Regional Haze Requirements

The Hayden Smelter is subject to FIP requirements for NO<sub>x</sub> and SO<sub>2</sub>, and SIP requirements for PM<sub>10</sub> under the Regional Haze Program. Under the FIP, the Hayden Smelter must comply with an annual emission limit

of 40 tons per year of NO<sub>x</sub> from the converters and anode furnaces.<sup>141</sup> To control PM<sub>10</sub>, the smelter must continue to use the existing controls and meet specified provisions of the NESHAPs for Primary Copper Smelters.<sup>142</sup> The smelter must reduce SO<sub>2</sub> at both the converters and anode furnaces.<sup>143</sup> The converters must comply with an emission limit of 99.8 percent control efficiency on a 365-day rolling average for the primary system and 98.7 percent efficiency on a 365-day rolling average for the secondary capture system. The smelter must impose a work practice standard requiring the anode furnaces to be charge only with blister copper or higher purity copper.

Lead is not a pollutant regulated under the Regional Haze Program. However, the controls and requirements for PM<sub>10</sub> will provide protection against any particulate matter with any leaded materials. Furthermore, the upgrades and improvements in the control technology at the Hayden smelter are in accordance with FIP and SIP requirements and thus will result in noninterference with the federal standards for Regional Haze.

Further, on August 15, 2022 ADEQ submitted its State Implementation Revision: Regional Haze Program (2018-2028). ADEQ deferred examination of the Hayden Smelter during the second implementation period due to existing effective controls to the facility.

## 6.7 Noninterference with Requirements for Consent Decree, CV-15-2206-PHX-DLR

On December 30, 2015 EPA and the Department of Justice announced a settlement with ASARCO LLC requiring the company to install new equipment and pollution control technology to reduce emissions of toxic heavy metals at the Hayden Smelter. ASARCO will also provide funding for local environmental projects, replace a diesel locomotive with a cleaner model, and pay a civil penalty.

The requirements outlined in the Consent Decree served as the foundation for the CRP and other control measures proposed in the SO<sub>2</sub> and Pb SIPs for the Hayden NAA. The control technology and other requirements all comply with the settlement and will result in noninterference with Consent Decree, CV-15-2206-PHX-JZB.

## 6.8 Air Toxics

The Mercury and Air Toxics Standards (MATS) are designed to reduce air pollution from coal and oil-fired power plants under CAA Section 111 (New Source Performance Standards) and 112 (Hazardous Air Pollutants/Air Toxics). Copper smelters are not subject to the MATS rules but they are required to comply with the National Emission Standards to Hazardous Air Pollutants (NESHAP) for Primary Copper Smelting.

The applicable NESHAPs for copper smelters are 40 CFR Part 63, Subpart QQQ and Subpart ZZZZ. ASARCO asserts that the Hayden Smelter is not a major source of hazardous air pollutants as prescribed in CAA Section 112 and the CFR. The upgraded controls and enhancements that were implemented per the requirements of the December 30, 2015 Consent Decree comply with CAA Section 112. Therefore, ADEQ concludes that this SIP revision will not interfere with any applicable air toxics requirements of the CAA.

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<sup>141</sup> See 79 FR 52420 (Sept. 3, 2014).

<sup>142</sup> See 78 FR 46142 (Sept. 30, 2013), 79 FR 52420, 52448 (Sept. 3, 2014).

<sup>143</sup> *Supra* Note 130.

## 7 Environmental Justice

This section describes environmental justice (EJ) concerns that may be relevant to this SIP revision.

EPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA further defines the term fair treatment to mean that “no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies.”<sup>144</sup>

First, this section examines EPA’s EJ analysis in its proposed national emissions standards for hazardous air pollutants (NESHAP) for primary copper standards. Second, this section reviews the EJ Screen analysis performed by ASARCO.

### 7.1 EPA’s Proposed Subpart QQQ Analysis

As part of EPA’s Residual Risk and Technology Review (RTR) for the primary copper smelting NESHAPs, EPA performed a baseline demographic analysis to identify how risks are distributed among different demographic groups of populations living within 5 km and 50 km of the Hayden and Miami copper smelters.<sup>145</sup>

EPA’s proposed fugitive lead controls for the Subpart QQQ RTR noted that benefits of process fugitive emissions reductions at the Hayden smelter will go primarily to those living closest to the Hayden smelter as fugitive emissions have the greatest impact on frontline/fenceline communities in the Hayden Nonattainment Area.

In the Subpart QQQ RTR for lead, EPA found that “modeled exceedances of the NAAQS based on estimated actual emissions were estimated to occur only in a small area near Freeport (located in Miami, AZ)” rather than near the Hayden smelter.<sup>146</sup>

EPA noted in the Subpart QQQ RTR proposed fugitive controls, the benefits of process fugitive emissions reductions at the Hayden smelter will go primarily to those living closest to the Hayden smelter as fugitive emissions tend to have the greatest impact on frontline/fenceline communities.<sup>147</sup>

### 7.2 Screening Analysis

As part of its permit application, ASARCO conducted a screening analysis utilizing EPA’s EJ Screen. EJ Screen is a mapping and screen tool developed by the EPA that uses a nationally consistent dataset and approach for combining environmental and demographic socioeconomic indicators.<sup>148</sup> This screening

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<sup>144</sup> National Emissions Standards for Hazardous Air Pollutants: Primary Copper Smelting Residual Risk and Technology Review and Primary Copper Smelting Area Source Technology Review, 87 FR 1616, 1654 (Jan. 11, 2022) (internal citation omitted).

<sup>145</sup> *Id.*

<sup>146</sup> 87 FR 1616, 1642 (Jan. 11, 2022).

<sup>147</sup> *Id.* at 1644.

<sup>148</sup> Environmental Protection Agency, *What is EJ Screen?* (Oct. 11, 2022). Retrieved from <https://www.epa.gov/ejscreen/what-ejscreen>.

analysis is attached as Appendix D. EJ Screen provided the information contained in Table 7-1, looking at communities within a 10-mile radius from the Hayden smelter.

**Table 7-1 EJ Screen Summary**

| Demographic Indicator              | Value | State Average | State Percentile |
|------------------------------------|-------|---------------|------------------|
| People of color                    | 60%   | 45%           | 70 <sup>th</sup> |
| Low income population              | 42%   | 35%           | 66 <sup>th</sup> |
| Linguistically isolated population | 1%    | 4%            | 48 <sup>th</sup> |
| Unemployment rate                  | 10%   | 6%            | 81 <sup>st</sup> |
| Population < high school education | 17%   | 13%           | 70 <sup>th</sup> |
| Population > 64 years of age       | 23%   | 17%           | 32 <sup>nd</sup> |
| EPA calculated Demographic index   | 51%   | 40%           | 70 <sup>th</sup> |

As EPA points out in its *Interim Environmental Justice and Civil Rights in Permitting*, tools like EJ Screen can help support consistent approaches by using standard benchmarks to characterize the potential for disproportionate impacts.<sup>149</sup> EJ Screen indices simplify the use of benchmarks for initial screening by highlighting indices at the 80<sup>th</sup>, 90<sup>th</sup>, or 95<sup>th</sup> percentiles.<sup>150</sup> The 80<sup>th</sup>, 90<sup>th</sup>, or 95<sup>th</sup> percentiles are highlighted by EJ Screen to examine the potential for disproportionate impacts relative to state, regional and national averages.<sup>151</sup>

Based on the EJ Screen analysis (Appendix D), the Hayden area only exceeds the 80<sup>th</sup> percentile for unemployment. All of the indicators are at or below the 70<sup>th</sup> percentile. EJ Screen reported one indicator, for lead paint as exceeding the 50<sup>th</sup> percentile. This is based on a percentage of housing that is pre-1960. Under the EJ Screen analysis the communities within the Hayden nonattainment area do not appear to be overburdened.

EPA's EJ Screen Tool does not explicitly include either the SO<sub>2</sub> NAAQS or the lead NAAQS in its calculations. State and Local Air Monitoring System (SLAMS) data show exceedances of the 1-hour SO<sub>2</sub> NAAQS prior to the CRP and that some exceedances occasionally occurred at a much lower ambient concentrations after the CRP was completed. Those exceedances were due in large part to damage at the double contact acid plant preheater, which allowed strong SO<sub>2</sub> gas to escape. The escaping strong gas caused most of the elevated SO<sub>2</sub> readings in the vicinity of the Hayden smelter after the completion of the Converter Retrofit Project. These episodes came to a stop when the smelter was temporarily shut down as a result of a work stoppage on October 13, 2019. Similarly, there were some exceedances of the lead NAAQS before the Converter Retrofit Project. Almost all exceedances stopped after the Converter Retrofit Project was completed. Since that time, there have been a few exceedances, likely related to construction work conducted in the vicinity of the monitor showing the elevated reading. Because the NAAQS are designed to be protective of human health, albeit with a margin of safety, persistent occasional exceedances of a NAAQS as occurred in the Hayden area prior to the temporary shutdown in 2019 could make these fenceline/frontline communities within the Hayden Nonattainment Area potentially overburdened, at least with respect to SO<sub>2</sub> and potentially Pb. On the other hand, in the Subpart QQQ RTR for lead, EPA

<sup>149</sup> Environmental Protection Agency, *Interim Environmental Justice and Civil Rights in Permitting* (Aug. 2022), pp. 8-9, <https://www.epa.gov/system/files/documents/2022-08/EJ%20and%20CR%20in%20PERMITTING%20FAQs%20508%20compliant.pdf>.

<sup>150</sup> *Id.*

<sup>151</sup> *Id.*

found that “modeled exceedances of the lead NAAQS based on estimated actual emissions were estimated to occur only in a small area near Freeport” rather than near the Hayden smelter.<sup>152</sup>

In its permit application, ASARCO notes that data support the conclusion that the CRP, with the Uptake Improvement Project, Fuming Ladle Control Project and Anode Secondary Hoods Project, will reduce fugitive lead emissions from smelter process sources an additional 30 percent. Based on this data, the controls in this SIP revision will reduce the number of individuals in communities of concern potentially overburdened by elevated Pb emissions. Therefore, ADEQ asserts this SIP revision will reduce emissions sufficient to achieve the NAAQS and not interfere with EJ.

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<sup>152</sup> See 87 FR 1616, 1642 (Jan. 11, 2022).

## 8 Conclusion

The 2008 Pb NAAQS were promulgated on November 12, 2008 based on EPA's research on human health effects of Pb pollution. As a result of violations at ambient air quality monitors, the Hayden planning area was designated nonattainment in 2014. The primary source of Pb emissions in the area is the primary copper smelter owned and operated by ASARCO LLC.

This SIP demonstrates, through modeling, an emissions inventory, and control measures that meet RACM/RACT requirements, the Hayden Pb planning area will attain the 2008 Pb NAAQS by its statutory attainment date. The attainment strategy for this SIP integrates control equipment already independently required by a Consent Decree between EPA and ASARCO in addition to new controls proposed in a 2023 permit revision. Should the area fail to attain, or fail to meet the compliance schedule required for Reasonable Further Progress, ASARCO must implement the required contingency measures.

By complying with nonattainment area related regulatory requirements under the Clean Air Act and applicable guidance, this SIP provides an enforceable vehicle to successfully mitigate Pb emissions in the Hayden nonattainment area in order to protect public health and the environment.