

Template for Technical Support Document

Definition of important terms used in this document:

1) **Designated "unclassifiable"** – an area where EPA could not determine if there was a violation of the 2008 Lead NAAQS or a contribution to a violation in a nearby area, because there was insufficient air quality data for both 2006-2008 and 2007-2009 and where additional monitoring data for 2010 could not result in a different designation.

2) **Designated "attainment"** – an area which EPA has determined, based on the most recent 3 years of certified air quality data from 2006-2008 or 2007-2009, has no violations of the 2008 Lead NAAQS during 36 consecutive valid 3-month site means; and which EPA has further determined does not contribute to a violation of the 2008 Lead NAAQS in a nearby area and that additional monitoring data from 2010 could not result in a different designation.

3) **Designated nonattainment area –** an area which EPA has determined, based on a State recommendation and/or on the technical analysis included in this document, has a violation of the 2008 Lead NAAQS during the most recent three consecutive years of quality-assured, certified air quality data.

4) Prior nonattainment area – an area that is currently designated as nonattainment or maintenance for the 1978 Lead Standard (including both current nonattainment areas and maintenance areas).

5**) Recommended nonattainment area –** an area a State or Tribe has recommended to EPA be designated as nonattainment.

6) Violating monitor – an ambient air monitor whose design value exceeds 0.15 micrograms per cubic meter (**µg/m³**). As described in Appendix R of part 50, a violation can be based on either Pb-TSP or Pb-PM_{10} data and only three months of data are necessary to produce a valid violating design value.

7) 1978 Lead NAAQS – 1.5 µg/m^3, National Ambient Air Quality Standard for lead promulgated in 1978. Based on Pb-TSP indicator and averaged over a calendar quarter.

8) 2008 Lead NAAQS - 0.15 µg/m^3, National Ambient Air Quality Standard for lead promulgated in 2008. Based on Pb-TSP indicator and a three-month rolling average. Pb-PM_{10} data may be used in limited instances, including to show nonattainment.

ARIZONA
Area Designations For the
2008 Lead National Ambient Air Quality Standards

The Environmental Protection Agency (EPA) has revised the level of the primary (health-based) National Ambient Air Quality Standard (NAAQS) for lead (Pb) from 1.5 micrograms per cubic meter (μg/m³) to 0.15 μg/m³ measured as total suspended particles (TSP). EPA has revised the secondary (welfare-based) standard to be identical in all respects to the primary standard.

Pursuant to section 107(d) of the Clean Air Act (CAA), EPA must designate as "nonattainment" those areas that violate the NAAQS and those nearby areas that contribute to violations. The table below identifies the portion of counties in Arizona (AZ) that EPA intends to designate "nonattainment" for the 2008 lead national ambient air quality standard (2008 Lead NAAQS).

Table 1. Designation Recommendations

Area	AZ Recommended Nonattainment Counties	EPA's Designated Nonattainment Counties	Nonattainment area for 1978 Lead NAAQS
Hayden	None*	Gila County (partial) Pinal County (partial)	na

*Governor of Arizona recommended delayed designations. EPA's recommended boundary is identical to the boundary described in ADEQ's December 2009 Boundary Recommendation Technical Support Document.

Technical Analysis for Hayden, Arizona and Surrounding Areas

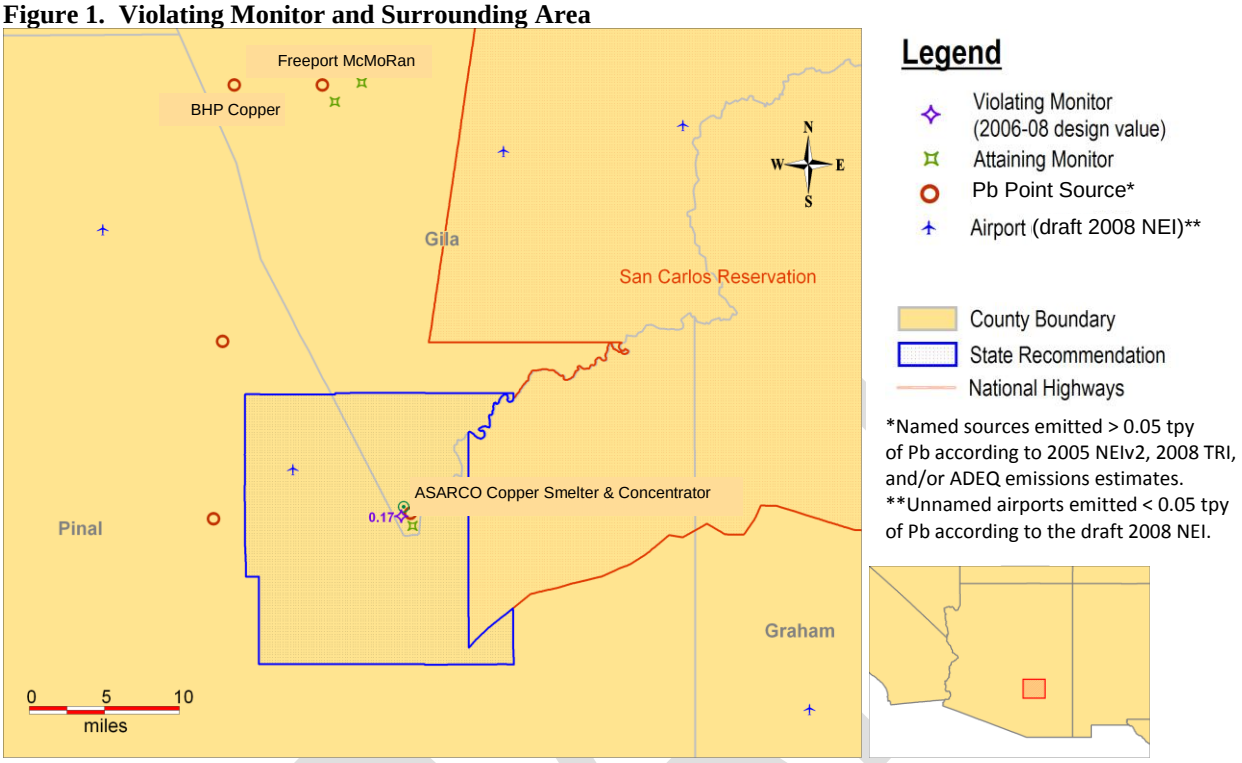
Introduction

This technical analysis for Hayden, Arizona identifies the monitor that violates the 2008 Lead NAAQS and evaluates nearby areas for contributions to ambient lead concentrations in the area. EPA has evaluated the surrounding area based on the weight of evidence of the following factors recommended in previous EPA guidance:

- Air quality in potentially included versus excluded areas;
- Emissions and emissions-related data in areas potentially included versus excluded from the nonattainment area, including population data, growth rates and patterns and emissions controls;
- Meteorology (weather/transport patterns);
- Geography/topography (mountain ranges or other air basin boundaries);
- Jurisdictional boundaries (e.g., counties, air districts, reservations, etc.); and
- Any other relevant information submitted to or collected by EPA (e.g., modeling where done appropriately).

Figure 1 is a map showing the state's recommended nonattainment area and the surrounding counties. Figure 2 shows the lead monitors in the area.

Figure 1. Violating Monitor and Surrounding Area



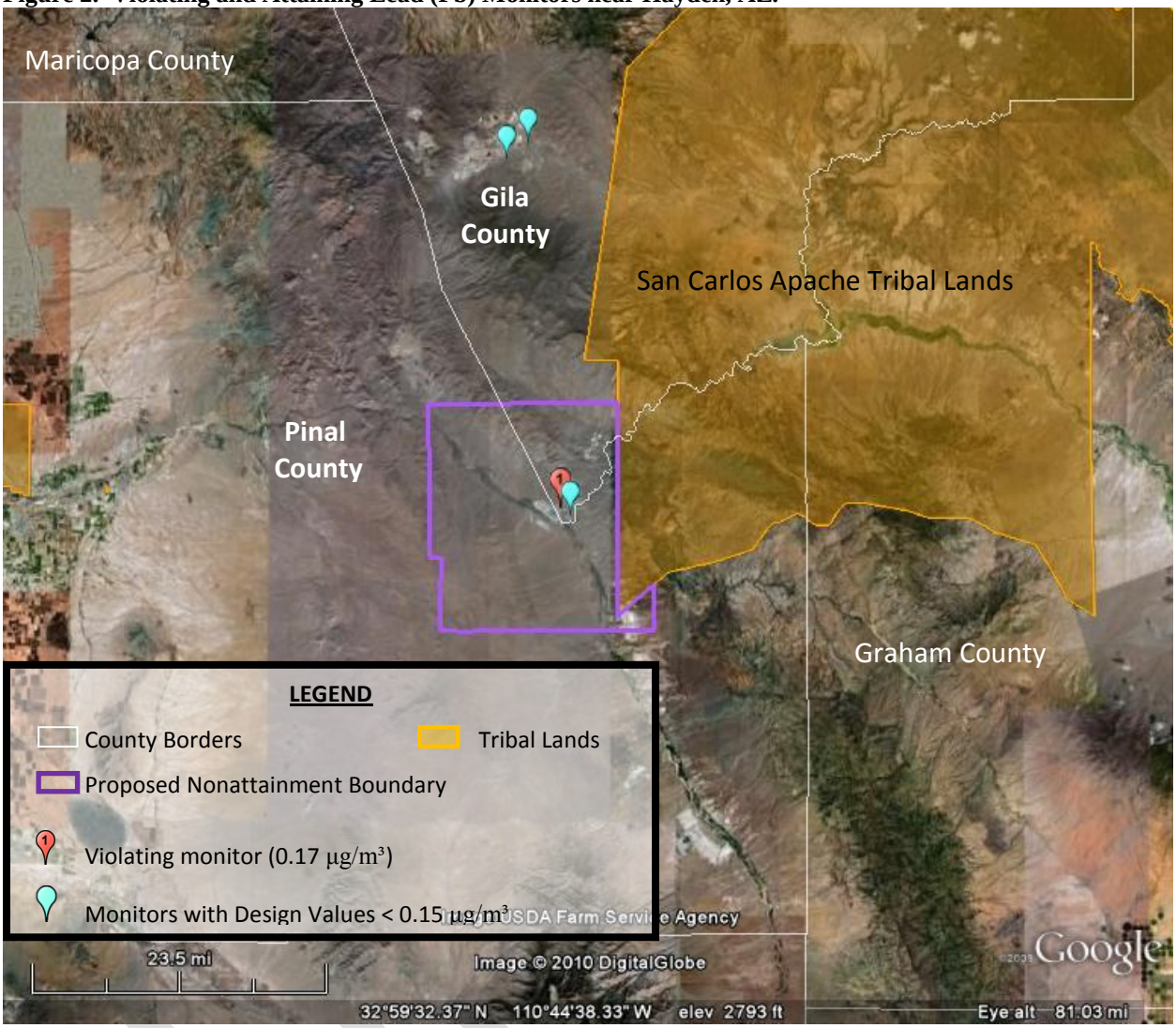
On December 15, 2009, the Governor of Arizona recommended that all portions of the State, excluding Indian Country,[1] be designated as unclassifiable/attainment for the Pb standard, with the exception of the Hayden area of Gila and Pinal Counties, which is violating the standard. Citing a commitment from the main source of Pb emissions in the area, ASARCO LLC, to improve Pb controls on its facility, the Governor requested that EPA delay its designation of the Hayden area. If exceedances are recorded between March 2010 – October 2010, or if ASARCO fails to agree to enforceable controls, the letter recommends promulgating a nonattainment boundary as shown in Figures 1 and 2.[2] The basis for the boundary is discussed in Arizona Department of Environmental Quality's (ADEQ's) boundary recommendation technical support document.[3]

[1] "Indian country" as defined at 18 U.S.C. 1151 refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same."

[2] December 2009 Arizona Recommendation

[3] ADEQ December 2009 Boundary Recommendation Technical Support Document

Figure 2. Violating and Attaining Lead (Pb) Monitors near Hayden, AZ.



EPA intends to proceed with the nonattainment designation of the Hayden area. In accordance with statutory deadlines specified in CAA Section 107, all areas must be designated for the revised Pb NAAQS no later than October 2011. Delaying Hayden's designation by one year would not materially change the data the designation would be based upon. In order to show attainment under the Pb NAAQS, an area must have three years of valid air quality data without any violations of the 2008 Pb NAAQS, and the area cannot contribute to a violation. As shown below, July-September 2008 monitoring data collected near the ASARCO facility show an exceedance of the 2008 Pb NAAQS. Even if EPA were to delay the designation of the Hayden area by one year based on a lack of monitoring data, the designation would have to be promulgated by October 2011 to meet the statutory deadline and would be based upon data from 2007-2009 or 2008-2010. The exceedance monitored during the July-September 2008 period would, therefore, still result in a nonattainment designation.

EPA is not delaying designation of the Hayden area as sufficient data are available to make a nonattainment determination at this time.

Based on EPA's technical analysis and currently available information, which is described below, EPA intends to designate the Hayden area of Gila and Pinal Counties as nonattainment for the 2008 Pb NAAQS.

Air Quality Data

This factor considers the Pb design values (in $\mu g/m^3$) for air quality monitors in the Hayden, AZ area and the surrounding area based on 2006-2008 data. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 2008 Pb NAAQS are met at a monitoring site when the identified design value is valid and less than or equal to 0.15 $\mu g/m^3$. A design value is only valid if minimum data completeness criteria are met. A Pb design value that meets the NAAQS is generally considered valid if it encompasses 36 consecutive valid 3-month site means (specifically for a 3-year calendar period and the two previous months). For this purpose, a 3-month site mean is valid if valid data were obtained for at least 75 percent of the scheduled monitoring days in the 3-month period. For purposes of assessing data capture, data collected before January 1, 2009 will be treated with an assumed scheduled sampling frequency of every sixth day, as specified by 40 CFR part 50 Appendix R, section 4(c)(i). A Pb design value that does not meet the NAAQS is considered valid if at least one 3-month mean that meets the same 75 percent requirement is above the NAAQS. That is, a site does not have to monitor for three full calendar years in order to have a valid violating design value; a site could monitor just three months and still produce a valid (violating) design value.

Pb monitors that collected data in Arizona for all or part of 2006 through 2008 are listed in Table 2.

As detailed in 40 CFR part 50 Appendix R, all FRM/FEM Pb-TSP and Pb-PM_{10} data collected in accordance with the requirements of 40 CFR part 58, including Appendix A (quality assurance), Appendix C (federal reference methods/federal equivalent methods (FRM/FEM)), and Appendix E (siting criteria), are comparable against the Pb NAAQS. In addition, Pb-TSP and Pb-PM_{10} data representing sample collection periods prior to January 1, 2009 (i.e., "pre-rule" data) will be considered valid for NAAQS comparisons and related attainment/nonattainment determinations if the data were submitted to EPA's Air Quality System (AQS) database prior to September 1, 2009, and the sampling and analysis methods used to collect the data were consistent with (1) previous or newly designated FRMs or FEMs, and (2) the provisions of 40 CFR part 58 that were in effect either at the time of original sampling or at the time of the attainment/nonattainment determination. 40 CFR part 50, Appendix R contains the requirement for data used for comparison with the Pb NAAQS.

In October 2006, EPA Region 9's Superfund Division began collecting Pb-PM_{10} monitoring data at the Hayden Maintenance Building monitor just west of the ASARCO copper concentrate and smelting facility in Hayden, AZ. EPA's Superfund Division also collected Pb-PM_{10} monitoring data at the Winkelman site, located to the southeast of the ASARCO facility. (See Figure 3.)

Values from July, August, and September 2008 resulted in a 3-month average design value of 0.17 μg/m³ at the Hayden Maintenance Building monitor.

EPA has reviewed the quality assurance and quality control documents collected during this sampling time. As required by 40 CFR part 58, Appendix A, a quality assurance project plan was in place at the time of sampling, as was a field sampling and data management plan. The information was entered into AQS in August 2009. Review of calibrations, flow checks, field data sheets, chain of custody forms and laboratory reports show data collected at Hayden from July through September 2008 to be valid.

Partisol-Plus Model 20205 Sequential Air Samplers were used at both Winkelman and the Hayden Maintenance Building sites. At the time, these monitors were designated as EPA PM_{10} reference method monitors (RFPS-1298-127).[4] On June 2, 2009, EPA published a Federal Register notice designating these monitors as federal reference monitors for PM Coarse (PM_{10c}).[5] The monitors therefore meet the Federal Reference Method/Federal Equivalent Method (FRM/FEM) requirements as specified in 40 CFR part 50, Appendix R. Filters were analyzed using Energy Dispersive X-ray Fluorescence Spectroscopy (EDXRF) consistent with EPA Compendium Method IO-3.3 and 40 CFR Part 50 Appendix R.[6]

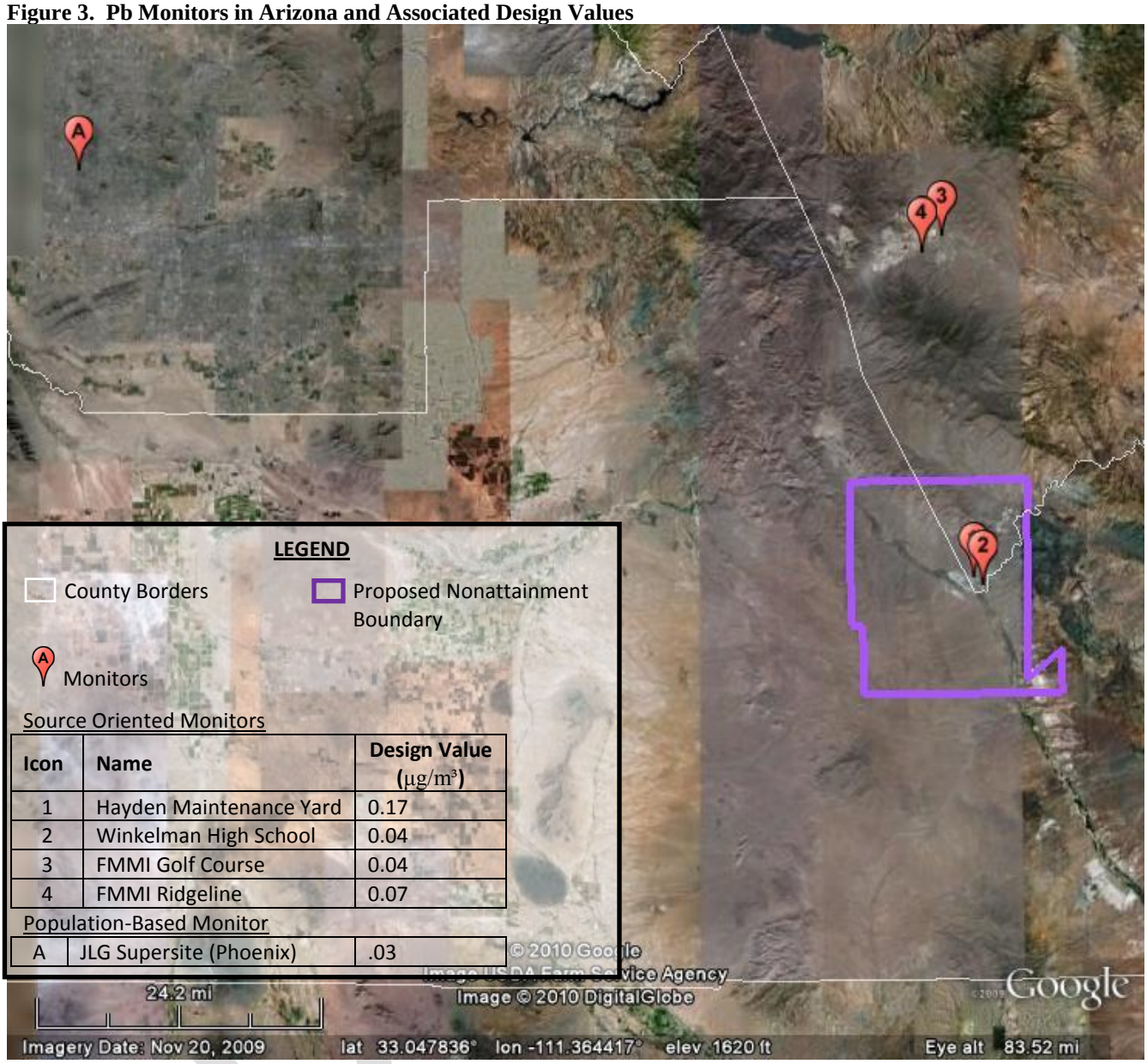
The Hayden Maintenance Building monitoring site meets all siting and network design requirements specified in 40 CFR 58 Appendices D and E. Located on the roof of a maintenance building, the monitor complies with the requirement in 40 CFR 58 App. D 4.5 (i) which states that "a monitor must be sited...where the Pb concentrations from all sources combined is expected to be at its maximum". It is appropriate for the monitor to capture contributions from ASARCO as well as any other Pb sources. This site is located in close proximity to a number of public residences and is an appropriate location for monitoring ambient air and population exposure.

EPA's review shows the data collected at the Hayden Maintenance Building between July – September 2008 to be valid for comparison against the Pb NAAQS.

Values from July, August, and September 2008 resulted in a 3-month average of 0.17 μg/m³ for the Hayden Maintenance Building monitor. For 2006-2008, the Winkelman site's design value (highest 3 month average that meets data completeness requirements) is 0.04 μg/m³.

[4] 69624 Federal Register / Vol. 63, No. 242 / Thursday, December 17, 1998 / Notices
[5] 26395 Federal Register / Vol. 74, No. 104 / Tuesday, June 2, 2009 / Notices
[6] 66964 Federal Register / Vol. 73, No. 219 / Wednesday, November 12, 2008 / Rules and Regulations

Figure 3. Pb Monitors in Arizona and Associated Design Values



Pb data were also collected near the Freeport McMoRan (FMMI) copper mining and smelting facility in Miami, AZ. Formerly owned by Phelps Dodge, the permitted facility has been operating monitors near the facility. The information has not been entered into AQS but was reviewed to inform these designations. The design value for the FMMI-Ridgeline monitor is 0.07 µg/m³. The design value for the FMMI-Golf Course monitor is 0.04 µg/m³.

Finally, the last Pb monitoring site in Arizona is the James L. Guyton (JLG) Supersite in Phoenix. Run by ADEQ, it also collects Pb-PM_{10} and has a design value of 0.01 µg/m³.

Table 2. Air Quality Data - Pb monitors in Arizona*

County	State Recommended Nonattainment?	Monitor Name	Monitor Air Quality System ID	Monitor Location	Lead Design Value, 2006 - 2008 ($\mu g/m^3$)
Gila County	No**	**Hayden Maintenance Building**	**04-007-8020-01**	**2nd Street and Garfield Ave, Hayden**	**0.17**
		Winkelman High School	04-007-8021-01	824 Thorne Ave., Winkelman	0.04
		FMMI Ridgeline	04-007-0009-01	4030 Linden St, Miami	0.07
		FMMI Golf Course	04-007-8000-01	SR 188 and US 60, Globe	0.04
Maricopa County	No	**JLG Supersite**	**04-013-9997-01**	**4530 N. 17th Ave, Phoenix**	**0.01**

*Monitors in Bold have the highest 2006-2008 design value in the respective county.
**Governor of Arizona recommended delayed designations. The Hayden and Winkelman monitors fall within the boundary described in ADEQ's December 2009 Boundary Recommendation Technical Support Document. The remaining monitors are outside of the boundary.

All five sites in Arizona collected Pb-PM_{10} data from 2006-2008. The revised 2008 Pb NAAQS is 0.15 $\mu g/m^3$, collected as Pb-TSP. Total suspended particulate (TSP) monitors collect both small-sized particles which may be inhaled, as well as larger-sized particles which are too large to be inhaled but may affect human health through ingestion. Monitors that collect particulate matter of 10 microns and smaller (PM_{10}**)** capture inhalable-sized lead, but do not capture the larger, ingestible lead particles. Ingestion can be a significant Pb exposure pathway, particularly for young children, and larger particles may, through weathering or mechanical action, become respirable at some point.[7] Because what is captured by a PM_{10} monitor may not account for the full Pb-TSP concentration, 40 CFR part 50 Appendix R, section 2(a)(i) specifies that Pb-PM_{10} data may be used to show nonattainment, but it cannot be used to show attainment. ADEQ is also required to install a Pb-TSP monitor near the ASARCO, Hayden smelter.

As shown in Figure 2, the San Carlos Apache tribal lands lie to the east of the recommended nonattainment area. There are no Pb ambient air monitors operating within the tribal lands, nor do the tribal lands have any sources emitting 0.1 tons per year of Pb or more (see Emissions and Emissions-Related Data section below). The Winkelman High School Pb-PM_{10} monitor is located to the east of the sole Pb source located within the nonattainment area (the ASARCO copper and smelting facility), and west of the tribal lands. Being a Pb-PM_{10} monitor, the Winkelman monitor does not capture any Pb particles larger than 10 microns that may be present in the ambient air. However, its design value of 0.04 $\mu g/m^3$ is well below the standard. EPA does not require Pb-PM_{10} monitors to be replaced by Pb-TSP monitors until a 3-month mean exceeds 0.10 $\mu g/m^3$.[8] Available air data therefore indicate that areas to the east of the monitor, including the San Carlos Apache tribal lands, are not causing the violation at the Hayden Maintenance Building monitor.

[7] 66964 Federal Register / Vol. 73, No. 219 / Wednesday, November 12, 2008 / Rules and Regulations.
[8] 40 CFR Part 58 Appendix C, section 2.10.2.

The Hayden Maintenance Building monitor, sited in Gila County, close to the border of Pinal County, is in violation of the 2008 Pb NAAQS. Therefore some portion of Gila County and possibly additional areas in surrounding counties must be designated nonattainment. We evaluate nearby counties because for each monitor or group of monitors that exceed a standard, nonattainment boundaries must cover a large enough area to include not only the area judged to be violating the standard but also the source areas that are determined to be contributing to the violations. Each area has been evaluated based on the weight of evidence of eight factors and other relevant information.

Emissions and Emissions-Related Data

Evidence of lead emissions sources surrounding a violating monitor are an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county level emissions data for lead, population data, and emissions controls.

Emissions

Emissions data were derived from the 2005 National Emissions Inventory, version 2 (NEIv2), which is the most up-to-date version of the national inventory. See http://www.epa.gov/ttnchie1/net/2005inventory.html. EPA recognizes that for certain counties, emissions may have changed since 2005. For example, certain large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. EPA therefore also considered 2008 TRI information for Arizona.[9] In addition, Arizona provided updated emissions for the ASARCO Hayden smelter.[10] Table 3 reflects data from the state, the 2005 NEIv2, and the 2008 TRI.

There are approximately 20,000 airport facilities in the U.S. at which leaded aviation gasoline is consumed. To evaluate the potential impact of emissions at and near these facilities, EPA recommends that States use the draft 2008 NEI. The Arizona airports which emit over 0.10 tons per year of Pb according to the draft 2008 NEI are listed in Table 4.

[9] TRI available at http://www.epa.gov/triexplorer/
[10] ADEQ December 2009 Boundary Recommendation Technical Support Document, p 7

Table 3. Arizona Facilities with Pb Emissions > 0.10 tpy.*

County	Facility in State Recommended Nonattainment Area?	Facility	Address	City	Facility Total Air Releases (tpy)
Gila	**No**	**Freeport-McMoRan Miami Inc**	**Hwy 60 And New St.**	**Claypool**	**4.90**
Gila	**No****	**Asarco LLC Ray Complex/ Hayden Smelter & Concentrator**	**640 Asarco Ave**	**Hayden**	**4.82**
Gila	**No**	**BHP Coppper Inc Pinto Valley Operation**	**Hwy 60 And Pinto Valley Rd**	**Miami**	**0.13**
Cochise	*No*	*Aacco Cast Products Inc*	*401 N Aacco Trails*	*Benson*	*0.23*
Greenlee	*No*	*Freeport-Mcmoran Morenci Inc*	*4521 Us Hwy 191*	*Morenci*	*0.44*
Maricopa	*No*	*Goodrich Corp Universal Propulsion Co*	*25401 N. Central Ave.*	*Phoenix*	*0.13*
Navajo	*No*	*Cholla Power Plant*	*4801 Frontage Rd*	*Joseph City*	*0.14*

*Emissions reflect highest value from ADEQ, 2008 TRI, and 2005 NEI version 2.
**Governor of Arizona recommended delayed designations. Facility falls within the boundary described in ADEQ's December 2009 Boundary Recommendation Technical Support Document.

Table 4. Airports in Arizona Emitting > 0.10 tpy Pb according to the draft 2008 NEI.

County	Airport in State Recommended Nonattainment Area?*	Facility	Type	City	Facility Total Air Releases (tpy)
Gila	**No**	**Payson**	**Airport**	**Payson**	**0.12**
Pinal	**No**	**Casa Grande Muni**	**Airport**	**Casa Grande**	**0.27**
Cochise	*No*	*Cochise College*	*Airport*	*Douglas*	*0.13*
Cochise	*No*	*Sierra Vista Muni-Libby AAF*	*Airport*	*Fort Huachuca Sierra Vista*	*0.11*
Coconino	*No*	*Grand Canyon National Park*	*Airport*	*Grand Canyon*	*0.29*
Coconino	*No*	*Flagstaff Pulliam*	*Airport*	*Flagstaff*	*0.11*
Maricopa	*No*	*Phoenix Deer Valley*	*Airport*	*Phoenix*	*1.35*
Maricopa	*No*	*Falcon Fld*	*Airport*	*Mesa*	*1.23*
Maricopa	*No*	*Chandler Muni*	*Airport*	*Chandler*	*0.93*
Maricopa	*No*	*Phoenix-Mesa Gateway*	*Airport*	*Phoenix*	*0.67*
Maricopa	*No*	*Phoenix Goodyear*	*Airport*	*Goodyear*	*0.61*
Maricopa	*No*	*Scottsdale*	*Airport*	*Scottsdale*	*0.50*
Maricopa	*No*	*Glendale Muni*	*Airport*	*Glendale*	*0.39*
Maricopa	*No*	*Phoenix Sky Harbor Intl*	*Airport*	*Phoenix*	*0.32*
Maricopa	*No*	*Pleasant Valley*	*Airport*	*Peoria*	*0.21*
Maricopa	*No*	*Gila Compressor Station*	*Airport*	*Arlington*	*0.18*
Maricopa	*No*	*Lakeside Airpark*	*Airport*	*Buckeye*	*0.18*
Maricopa	*No*	*Goldfield Ranch*	*Airport*	*Fountain Hills*	*0.18*
Maricopa	*No*	*Gila Bend AF Aux*	*Airport*	*Gila Bend*	*0.18*
Maricopa	*No*	*Luke AFB*	*Airport*	*Glendale*	*0.18*
Maricopa	*No*	*Mobile*	*Airport*	*Mobile*	*0.18*
Maricopa	*No*	*Roesner Ranch*	*Airport*	*Morristown*	*0.18*
Maricopa	*No*	*Paloma Ranch*	*Airport*	*Paloma*	*0.18*
Maricopa	*No*	*Airscrew Performance Flightpark*	*Ultralight*	*Glendale*	*0.18*
Maricopa	*No*	*Wickenburg Muni*	*Airport*	*Wickenburg*	*0.13*
Maricopa	*No*	*Buckeye Muni*	*Airport*	*Buckeye*	*0.11*

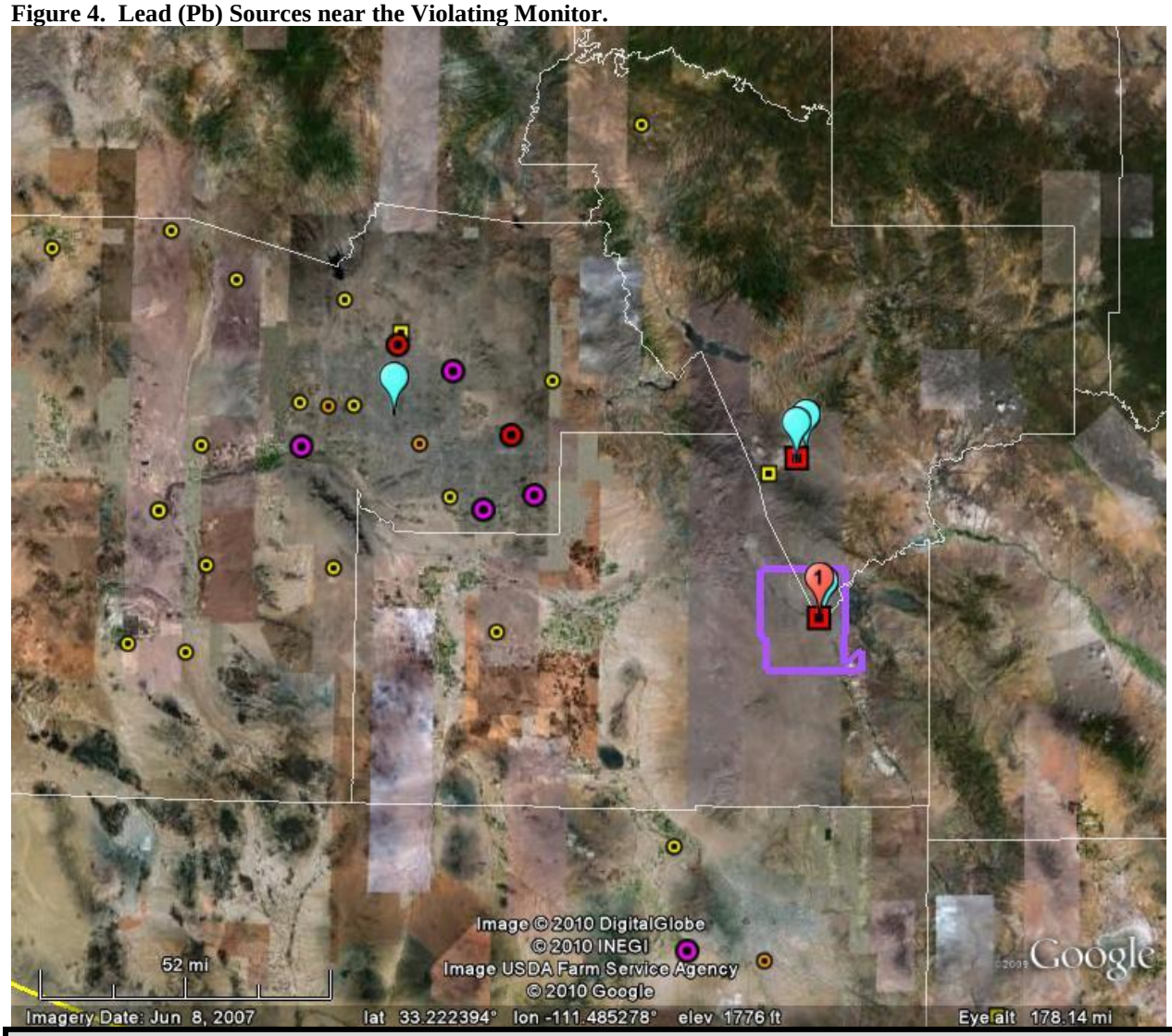
Maricopa	*No*	*Stellar Airpark*	*Airport*	*Chandler*	*0.11*
Maricopa	*No*	*Eagle Roost Airpark*	*Airport*	*Aguila*	*0.11*
Mohave	*No*	*Grand Canyon West*	*Airport*	*Peach Springs*	*0.27*
Mohave	*No*	*Kingman*	*Airport*	*Kingman*	*0.16*
Mohave	*No*	*Lake Havasu City*	*Airport*	*Lake Havasu City*	*0.14*
Pima	*No*	*Ryan Field*	*Airport*	*Tucson*	*0.72*
Pima	*No*	*Tucson Intl*	*Airport*	*Tucson*	*0.44*
Pima	*No*	*Marana Rgnl*	*Airport*	*Tucson*	*0.25*
Yavapai	*No*	*Ernest A. Love Field*	*Airport*	*Prescott*	*0.92*
Yavapai	*No*	*Sedona*	*Airport*	*Sedona*	*0.13*
Yuma	*No*	*Yuma M. C. A. S.*	*Airport*	*Yuma M. C. A. S.*	*0.16*

*Governor of Arizona recommended delayed designations. No airports in Table 4 fall within the boundary described in ADEQ's December 2009 Boundary Recommendation Technical Support Document.

Figure 4 shows airports and point sources in the area near the violating monitor. According to the information sources listed above, other than the ASARCO copper smelter there are no sources that emit over 0.10 tons of Pb per year within 25 miles of the violating monitor.

There are no known Pb sources emitting 0.1 tons per year of Pb or greater in the San Carlos Apache tribal lands. Without any sources emitting over 0.1 tons per year of Pb, it is unlikely the San Carlos Apache tribal lands are causing or contributing to the violation at the Hayden Maintenance Building monitor. As discussed in the Air Quality Data section above, data from the Winkelman High School monitor supports this conclusion. Air quality and emissions data support excluding the San Carlos Apache tribal lands from the nonattainment area.

Figure 4. Lead (Pb) Sources near the Violating Monitor.



LEGEND

- Violating Monitor (0.17 µg/m³)
- Monitors with Design Values < 0.15 µg/m³
- County Borders
- Proposed Nonattainment Boundary

Airports (according to the draft 2008 NEI)

- 0.1 – 0.3 tpy
- 0.3 – 0.5 tpy
- 0.5 – 1.0 tpy
- > 1.0 tpy

Other Point Sources (according to 2005 NEIv2, state emissions inventory, 2008 TRI)

- 0.1 – 0.3 tpy
- 0.3 – 0.5 tpy
- 0.5 – 1.0 tpy
- > 1.0 tpy

Population Data, Growth Rates and Patterns

Table 5 shows the 2008 population and population density for counties in the area. Table 6 provides projected population growth for towns near Hayden. These data help assess the extent to which the concentration of human activities in the area and concentration of population-oriented commercial development may indicate emissions-based activity contributing to elevated ambient lead levels. This may include ambient lead contributions from activities that would disturb lead that has been deposited on the ground or on other surfaces. Re-entrainment of historically deposited lead is not reflected in the emissions inventory.

Table 5. Population Data

County	State Recommended Nonattainment?	2008 Population	2008 Population Density (pop/sq mi)	Population Change 2000-2008	Population % Change 2000-2008
Gila	No*	52,166	11	807	2
Graham	No	36,452	8	2,910	9
Maricopa	No	3,954,598	429	857,098	28
Pinal	No*	327,301	61	146,025	81

*Governor of Arizona recommended delayed designations.
Source of data:U.S. Census Bureau estimates for 2008 (http://www.census.gov/popest/datasets.html) and estimation of the area of U.S. Counties

While data contained in Table 5 indicates considerable growth in Pinal County from 2000-2008, this growth occurred primarily south and west of the Hayden area. ADEQ's December 2009 Boundary Recommendation Technical Support Document shows the Hayden area's population is projected to remain between 0-50 people per square mile through 2030.[11] As shown in Table 6, towns near Hayden are also projected to have little to no growth over the coming years. The locations of nearby towns are shown in Figure 5.

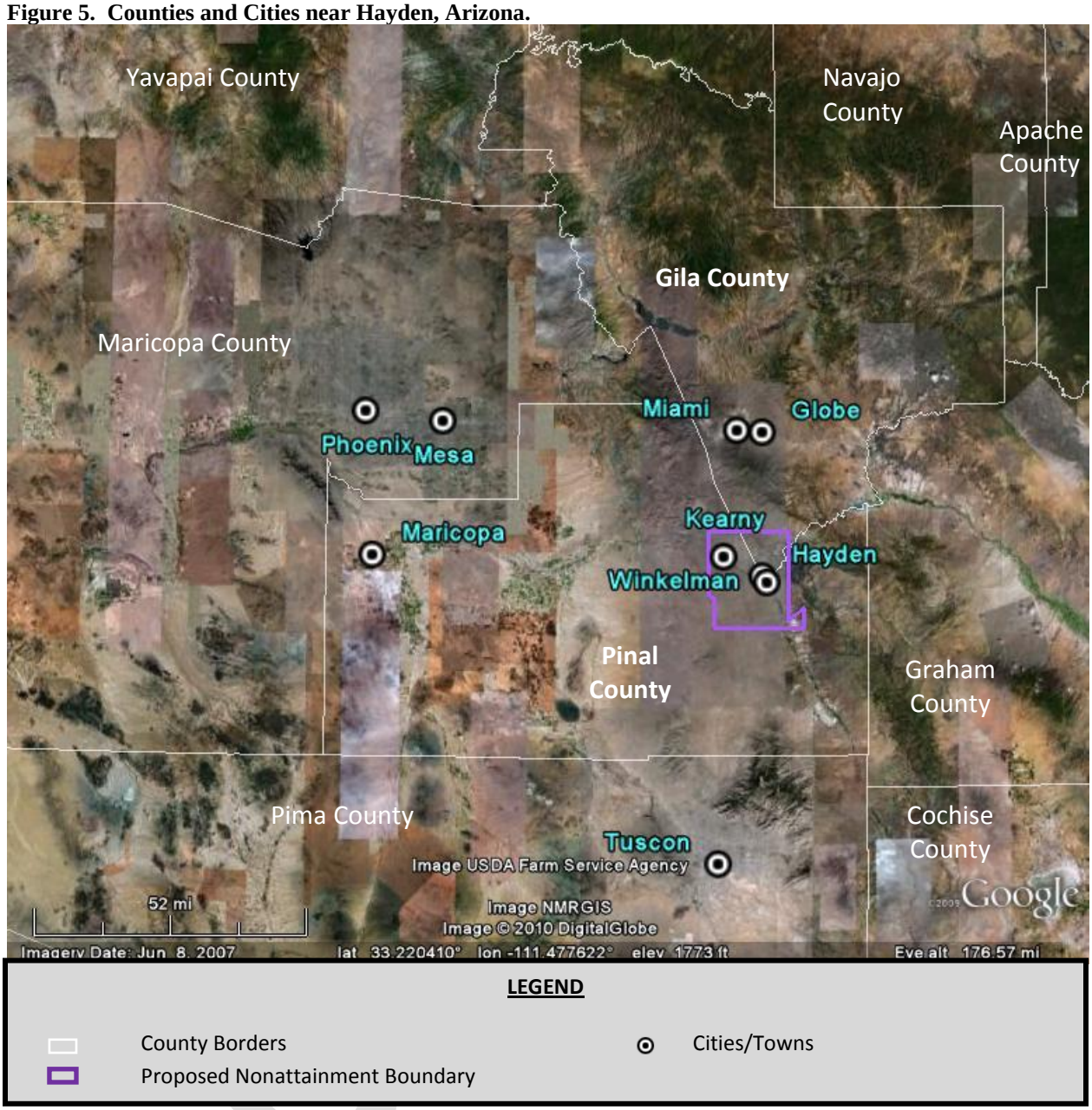
Table 6. Historical and Projected Population for Gila and Pinal Counties, and selected towns near Hayden.[12]

	2000	2008	2015	2031
Pinal County	116,397	316,899	486,363	876,091
Gila County	51,335	56,427	61,128	70,358
Globe	7,486	7,603	7,974	8,647
Miami	1,936	1,973	2,022	2,104
Kearny	2,449	2,085	2,630	3,774
Winkelman	443	430	430	430
Hayden	892	860	860	860

Sources: Historical data – U.S. Census Bureau; Projections – Arizona Department of Commerce.

[11] ADEQ December 2009 Boundary Recommendation Technical Support Document, pp 8-12.
[12] ADEQ December 2009 Boundary Recommendation Technical Support Document, p 18.

Figure 5. Counties and Cities near Hayden, Arizona.



EPA has considered the population growth rate for this area and does not believe that it affects the boundary recommendation.

Emissions Controls

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Tables 3 and 4 represent emissions levels taking into account any control strategies implemented prior to the relevant data collection.

Specific to ASARCO, required control measures and technologies are listed in the operating permit issued by ADEQ. See ADEQ's December 2009 Boundary Recommendation Technical Support Document for more details.

Meteorology (weather/transport patterns)

Due to the constraints imposed by the complex terrain in the Hayden area (see Geography/Topography factor), the extent of the area exceeding the Pb standard is confined to a relatively small area around the main source of lead emissions, the ASARCO Hayden smelter. For the same reason, locations outside the particular valleys intersecting at Hayden do not contribute to NAAQS exceedances there. Therefore, the meteorology factor did not play a significant role in determining a boundary for the nonattainment area.

Meteorological data is available from the very nearby Winkelman 6 S station, part of the National Weather Service Cooperative Observer Program. There is typically only 14 inches of rain each year, with nearly half occurring July through September, coinciding with the Arizona "monsoon" season. There is less than an inch of snow each year. Daily temperature highs range from 64 to 91°F depending on season, and lows range from 31 to 69°F.

General wind information for Gila County is presented in Figure 6. Varied elevations in and around Hayden cause complex local wind flow. Within and adjacent to the Gila River and San Pedro River valleys, drainage winds tend to dominate at night under stable conditions, toward the west on the south and west side of the smelter, and toward the south on the east side of the facility. These conditions cause air pooling in low-lying areas at night, causing pollutants within the air to settle in these areas. During the day under convective conditions, good vertical mixing causes polluted air to reach the ground. The vertical mixing also causes the flow to be coupled with winds aloft, which generally flow toward the east.

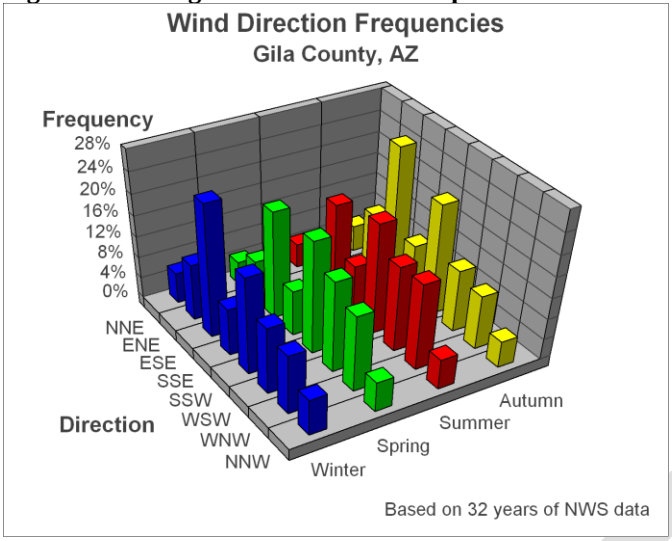
ADEQ's boundary recommendation technical support document further describes wintertime conditions.

> During the wintertime, relatively strong inversions (where cold air becomes trapped at the surface by warmer air aloft) create extremely stable atmospheric conditions. Depending on the strength of the inversion and amount of daytime surface heating, the inversion may break by the early afternoon, permitting the air to mix vertically. Sometimes, however, the inversion may not break at all. Under these conditions, vertical and horizontal movement of the air is very limited, causing pollutants in the air to accumulate up to several days with little dispersion.[13]

As described in the Geography and Topography factor below, Hayden's complex terrain limits the extent of the area exceeding or contributing to the violation.

[13] ADEQ December 2009 Boundary Recommendation Technical Support Document, p 21.

Figure 6. Average Wind Direction Frequencies in Gila County, AZ.



Source: A three-dimensional bar chart shows the wind frequencies in eight directions for the four seasons. This data is taken from 1960-1992 Solar and Meteorological Surface Observation Network information issued jointly by the U.S. Department of Commerce: National Climatic Data Center and the U.S. Department of Energy: National Renewable Energy Laboratory. The chart frequencies reflect the directions from which the winds come.

Geography/topography (mountain ranges or other air basin boundaries)

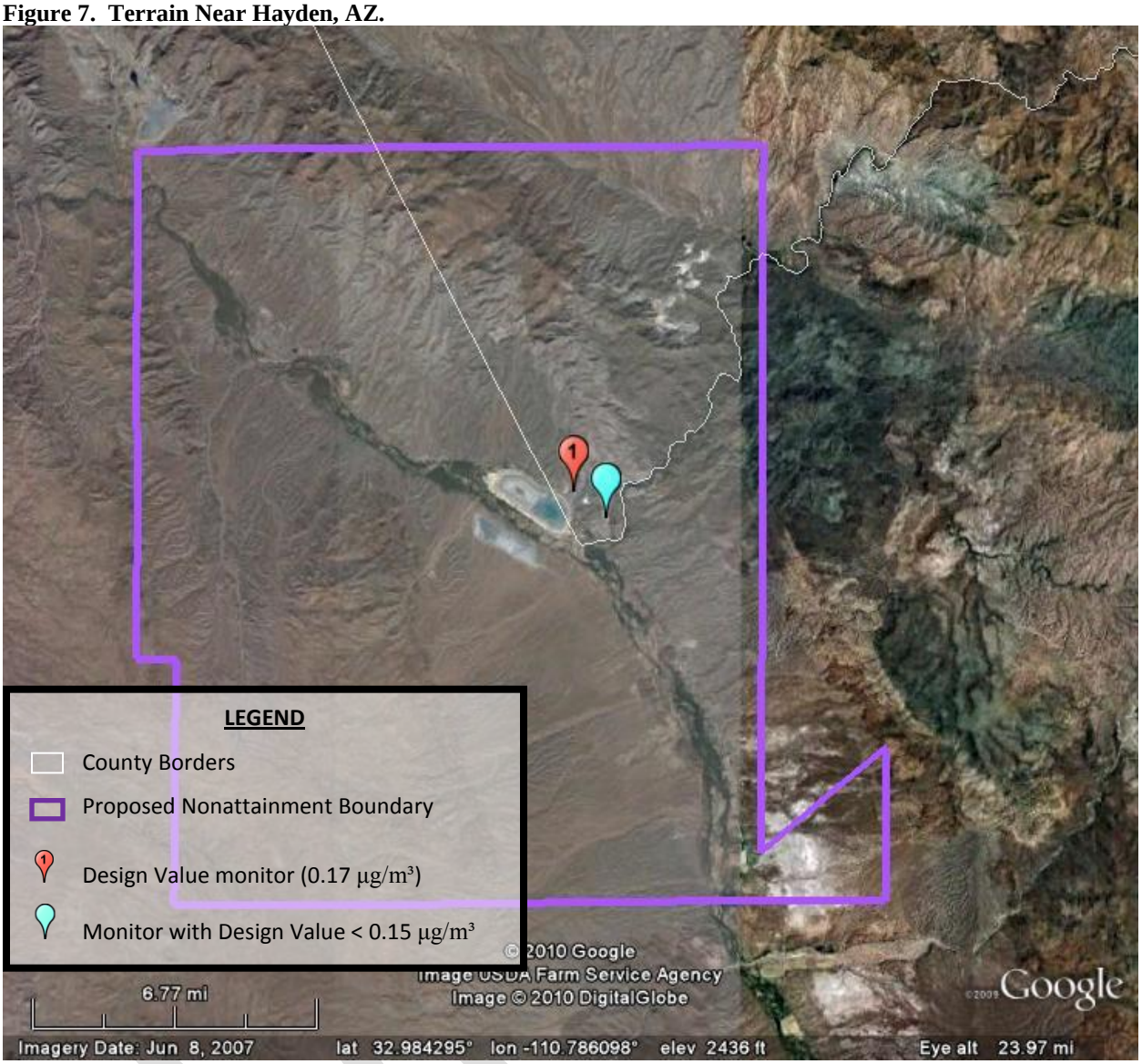
The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of lead over Hayden, Arizona. As shown in Figure 7, the ASARCO Hayden smelter is located in very complex terrain, with the Gila River making a winding semi-circle south of the facility, and intersected by the San Pedro River valley from the south. The facility itself is elevated relative to the valleys; there is a 200 foot hill just south of the facility, and mountains rising toward the north/northeast. ADEQ's boundary recommendation technical support document contains the following terrain description.

> Hayden lies in the Gila River Valley, approximately 2,044 feet above sea level. The town sits at the base of the Dripping Springs Mountains which rise to a height of approximately 5,096 feet. The Mescal and Pinal Mountain ranges rise to the east beyond the Dripping Springs range to approximately 7,848 feet in elevation at the highest point. To the west of Hayden, the Tortilla Mountains rise to a height of 4,273 feet. The complex terrain forms natural boundaries that isolate the Hayden area from most of Gila and Pinal Counties.[14]

In all directions there is a mountain side, limiting the extent of the area exceeding the Pb standard to a relatively small area around the smelter, the main source of Pb emissions. For the same reason, locations outside the particular valleys intersecting at Hayden do not contribute to NAAQS exceedances there. This supports a relatively small nonattainment area, comprising the nearby valleys and mountains, and including a buffer zone.

[14] ADEQ December 2009 Boundary Recommendation Technical Support Document, p 21.

Figure 7. Terrain Near Hayden, AZ.



Jurisdictional boundaries

Existing jurisdictional boundaries may be helpful in articulating a boundary for purposes of nonattainment designations, and for purposes of carrying out the governmental responsibilities of planning for attainment of the lead NAAQS and implementing control measures. These existing boundaries may include an existing nonattainment or maintenance area boundary, a county or township boundary, a metropolitan area boundary, an air management district, or an urban planning boundary established for coordinating business development or transportation activities.

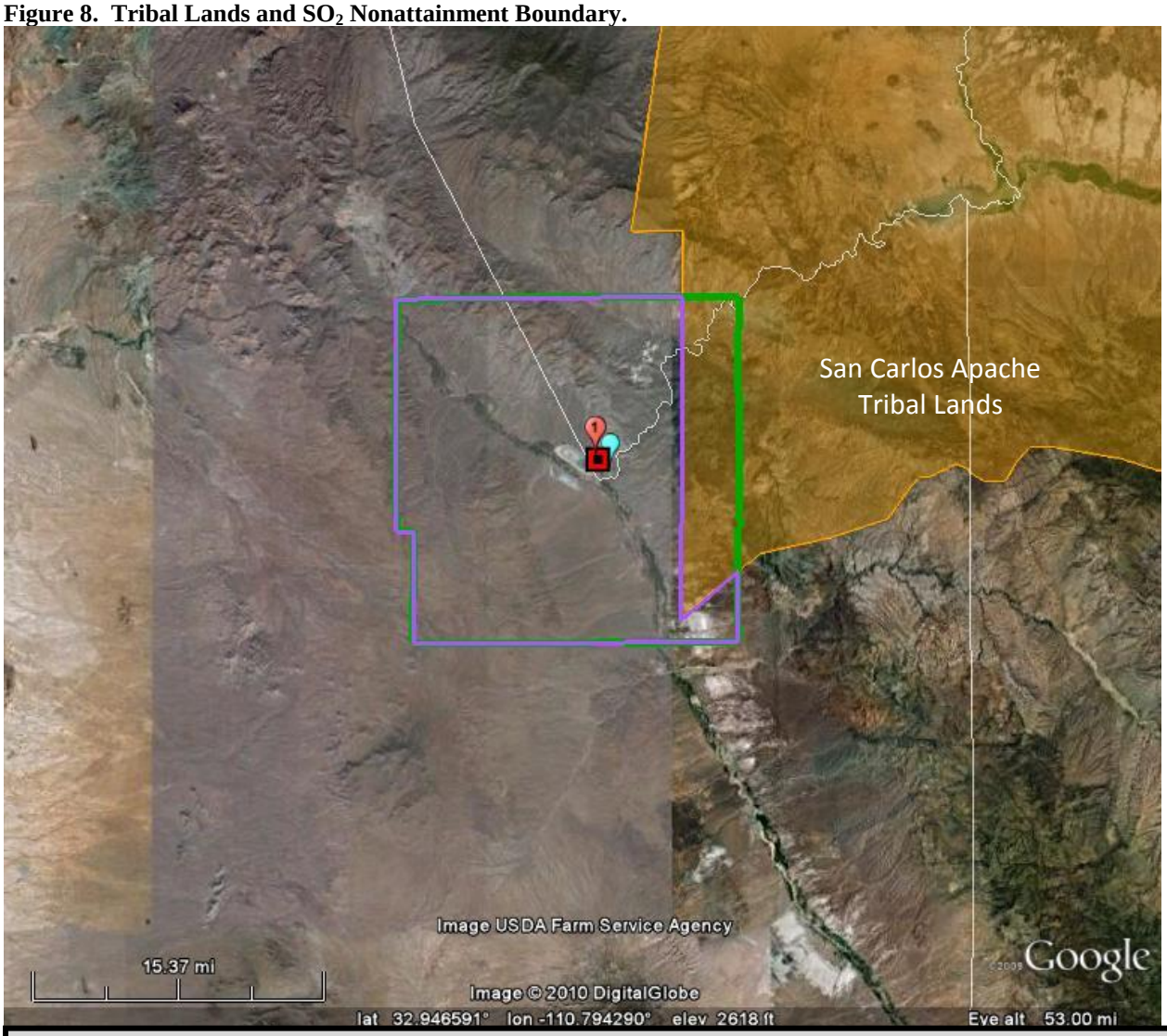
In evaluating the jurisdictional factor, EPA considered the planning and organizational structure of Pinal County, Gila County and the State of Arizona, as well as existing nonattainment boundaries, to ensure that the implementation of controls within the prospective nonattainment area can be carried out in a cohesive manner. See Figure 5 for county boundaries.

ADEQ has overall jurisdiction over environmental programs in the state of Arizona, as well as jurisdiction over certain source types, including smelters, refineries, and coal-fired power plants, and retains authority for regulating emissions from agricultural operations. Three Arizona counties, Maricopa, Pima, and Pinal, have their own air pollution control programs and operate pursuant to agreements with ADEQ. The lead air quality planning agencies responsible for state implementation plans (SIPs) for Maricopa County and Pima County are the metropolitan planning organizations (MPO), the Maricopa Association of Governments (MAG) and the Pima Association of Governments (PAG), respectively. There is no MPO and thus no air quality planning agency for SIP purposes in Pinal County or Gila County. Therefore, ADEQ is responsible for developing SIPs for these counties.
As shown in Figure 8, the San Carlos Apache tribal lands lie to the east of the recommended nonattainment area in both Pinal County and Gila County. Neither ADEQ nor the counties have jurisdiction over tribal lands.

With the exception of the eastern boundary, the intended Pb nonattainment area boundary coincides with that of the existing Hayden SO_2 nonattainment area[15]. Arizona recommended excluding Indian Country from the nonattainment area, as the state has no jurisdiction over Indian lands.[16] As discussed in previous sections of this document, the Winkleman monitor, located just east of Hayden and west of the San Carlos Apache tribal lands, has a design value of 0.04 $\mu g/m^3$, well below the standard. There are no known Pb sources emitting 0.1 tons per year of Pb or greater in the San Carlos Apache tribal lands. Given the air quality data, lack of sources, the low monitored concentrations, and the state's lack of jurisdiction, EPA supports excluding the San Carlos Apache tribal lands from the recommended Hayden Pb nonattainment area.

[15] 44 FR 21261, April 10, 1979
[16] ADEQ December 2009 Boundary Recommendation Technical Support Document, p 2

Figure 8. Tribal Lands and SO_2 Nonattainment Boundary.



LEGEND

- Violating Monitor (0.17 µg/m³)
- Monitor with Design Value < 0.15 µg/m³
- County Borders
- SO_2 Nonattainment Boundary
- Proposed Pb Nonattainment Boundary
- Tribal Lands

Airports (according to the draft 2008 NEI)

- 0.1 – 0.3 tpy
- 0.3 – 0.5 tpy
- 0.5 – 1.0 tpy
- > 1.0 tpy

Other Point Sources (according to 2005 NEIv2, state emissions inventory, 2008 TRI)

- 0.1 – 0.3 tpy
- 0.3 – 0.5 tpy
- 0.5 – 1.0 tpy
- > 1.0 tpy

Other Relevant Information

See ADEQ's submittal documents for further details.

Conclusion

After considering the factors described above, EPA believes it is appropriate to include the Hayden portions of Gila and Pinal Counties in the Hayden 2008 Pb NAAQS nonattainment area.

The Hayden Maintenance Building air quality monitor near the ASARCO copper smelting and concentrate facility in Gila County shows a violation of the 2008 Pb NAAQS, based on 2006-2008 air quality data. All other Pb monitors in Arizona currently attain the standard, including those north and east of the violating monitor. Given the heavy weight of Pb, emissions are not expected to transport long distances. Instead, Pb emissions fall out of the atmosphere relatively close to their emission point. The topography and geography of the Hayden area further support the boundaries identified by the state. Based on its consideration of all the relevant, available information, as described above, EPA believe that the boundaries described herein encompass the entire area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the 2008 Pb NAAQS.

Citations

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