

# State of Arizona Air Monitoring Network Plan

For the Year 2012

Arizona Department of Environmental Quality  
Air Quality Division  
Air Assessment Section

**Final**

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## 1.0 INTRODUCTION

This document fulfills the obligation, under the Code of Federal Regulations (CFR), Title 40, Section 58.10(a), requiring Arizona Department of Environmental Quality (ADEQ) to complete and submit to the United States Environmental Protection Agency (EPA) an annual network monitoring plan for the year 2012.

This plan informs EPA (Region 9) of the monitoring activities ADEQ has implemented since July 2011, as well as activities ADEQ will undertake July 2012, through December 2013. However, some changes may occur after the plan is published and approved due to unforeseen events at monitoring sites, funding changes, or changes in EPA monitoring requirements. Data from ADEQ's monitors are reported to EPA's Air Quality System (AQS) database and to AIRNow.

In 40 CFR 51, EPA requires states to create, submit, and adopt State Implementation Plans (SIPs) to address the various issues and responsibilities involved with creating and implementing air quality programs. Subpart J of Part 51 specifies that Part 58 Subpart B contains the requirements for establishing air quality surveillance systems to monitor ambient air quality.

Air quality surveillance systems consist of networks of monitors at carefully-chosen physical locations referred to as sites or stations. Some of the networks, sites, and monitors are:

- State and Local Air Monitoring Stations (SLAMS)
- National Core multipollutant monitoring stations (NCore)
- Photochemical Assessment Monitoring Stations (PAMS)
- Chemical Speciation Network (CSN)
- National Air Toxics Trends Sites (NATTS)
- Special Purpose Monitors (SPM)
- Urban Haze monitoring sites
- Interagency Monitoring of PROtected Visual Environments (IMPROVE)
- AIRNow information sites
- Source-oriented monitoring sites operated independently by permittees (Industry)
- Meteorological sites

This Annual Monitoring Network Plan identifies the purpose(s) of each monitor and provides evidence that both the siting and the operation of each monitor meet the requirements in 40 CFR Part 58 appendices A, C, D, and E as follows:

- Appendix A – Quality Assurance Requirements for SLAMS, SPMs, and Prevention of Significant Deterioration (PSD) Air Monitoring
- Appendix C – Ambient Air Quality Monitoring Methodology
- Appendix D – Network Design Criteria for Ambient Air Quality Monitoring
- Appendix E – Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring

Results of the annual network review and planning are used to determine how well the networks are achieving their required air monitoring objectives, how well they meet data users' needs, and how they

should be modified (through termination of existing stations, relocation of stations, establishment of new stations, monitoring of additional parameters, and/or changes to the sampling schedule) in order to continue to meet their objectives and data needs. The annual network review and planning are performed for the purpose of improving the networks and ensuring that they provide adequate, representative, and useful air quality data.

## 2.0 ADEQ PROGRAM AND NETWORK DESCRIPTIONS

ADEQ operates ambient air quality equipment for a variety of Federal and State monitoring programs. Detailed descriptions of the equipment deployed for each monitoring program are presented in Appendix C. The equipment is grouped by monitoring program or network to easily compare instrument specifics across the networks. Appendix D lists the information about each of ADEQ's current monitoring sites (or those recently closed), including those sites which ADEQ shares with other agencies or serves as the local site operator. General information about the monitoring programs that ADEQ participates in is described in the following sections.

### 2.1 NAAQS Compliance Network

The largest compliance network in Arizona consists of monitoring sites operated for the purpose of demonstrating compliance with the National Ambient Air Quality Standards (NAAQS) for the “criteria” pollutants: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and lead (Pb). The criteria pollutants are measured using instruments that have been certified by the EPA as Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM). 40 CFR Part 58 specifies the minimum requirements for determining NAAQS compliance including the following network and site criteria:

- Number and types of monitors required per Metropolitan Statistical Area (MSA) by pollutant
- Objectives and spatial scales
- Sampling frequency
- Collocation
- Special NCore-related requirements
- Meteorology
- Probe location and other restrictions within a site
- Periodic performance evaluations
- Quality Assurance
- Data reporting

#### 2.1.1 Changes to the NAAQS

**Pb** – In November 2008, EPA revised the Pb NAAQS from 1.5 µg/m<sup>3</sup> to 0.15 µg/m<sup>3</sup>. New requirements for the placement of monitors were added: (1) near Pb sources (by January 1, 2010) having annual ambient air Pb emissions that are expected to exceed one ton and (2) in non-source urban areas (by January 1, 2011) with populations greater than 500,000. In December 2009, EPA proposed revisions to these monitoring requirements. In December 2010, the EPA finalized the Pb monitoring requirements which required Pb monitoring near sources with Pb emissions greater than 0.5 tons. The rule also clarified that monitoring near airports was only required at select locations. Additionally, the final rule adjusted the non-source monitoring requirement to be limited to NCore sites that are located within CBSAs with populations of 500,000 or greater. NCore Pb monitors and source-oriented Pb monitors associated with the new 0.5 to one ton emissions threshold were to be operational one year from the date of the final rule.

**O<sub>3</sub>** – After several delays, in September 2011, the EPA indicated that they would uphold their original 2008 decision to set the eight-hour NAAQS at 0.075 ppm. The EPA has also indicated that the proposed monitoring rule issued in July 2009, would likely not move forward on several fronts. The EPA has unofficially stated that the only part of the proposed rule that may be implemented would be the changes in ozone seasons. As a result, unlike previous network plans, ADEQ will not include the 2009 proposed monitoring rule in their network plan evaluation for 2012.

**SO<sub>2</sub>** – In June 2010, EPA revised the primary SO<sub>2</sub> standard by establishing a new one-hour standard at a level of 75 parts per billion (ppb). The new form is the three-year average of the 99<sup>th</sup> percentile of the annual distribution of daily maximum one-hour concentrations. It is also revoking the two existing primary standards of 140 ppb evaluated over 24 hours and the 30 ppb evaluated over a year. Additionally, the EPA required changes to data reporting requirements to include reporting the maximum five minute concentration for each hour in addition to the hourly averaged concentrations. ADEQ began collecting and processing hourly maximum five minute SO<sub>2</sub> concentrations in July and August, 2010. New monitoring requirements for placement of monitors were also issued, and monitors must be operational by January, 2013. The new monitoring requirements do not result in any SO<sub>2</sub> network changes for ADEQ, as population oriented monitors will be covered by Maricopa and Pima County agencies and the source oriented monitors have been established for years.

**NO<sub>2</sub>** – In January 2010, EPA set a new one-hour standard for NO<sub>2</sub> of 100 ppb. EPA is retaining the annual standard of 53 ppb. The form of the standard is the three-year average of the 98<sup>th</sup> percentile of the annual distribution of daily maximum one-hour average concentrations. New monitoring requirements were established including near roadway monitors in urban areas, additional urban monitors in large urban areas, and monitors in areas with populations susceptible to NO<sub>2</sub> related health effects. The new monitoring requirements are not expected to result in any NO<sub>2</sub> network changes for ADEQ, as population oriented monitors and near roadway monitors will be operated by Maricopa and Pima County agencies.

**CO** – In August 2011, EPA finalized network design changes that would place CO monitors at a subset of near-road NO<sub>2</sub> monitoring sites. ADEQ will not be required to and does not anticipate creating any near-road NO<sub>2</sub> sites. Two sites are anticipated in Maricopa County and one in Pima County. ADEQ's CO monitoring efforts continue to focus on CO trace-level monitoring at the JLG Supersite as part of the NCore network.

## **2.2 State Implementation Plan (SIP) and Maintenance Area Network**

ADEQ maintains several air monitoring sites for the purpose of tracking compliance in areas that are currently not attaining one or more of the NAAQS and in areas where the NAAQS has been met, but ongoing demonstration of compliance is required. Monitoring requirements for these areas are described in their associated SIPs.

## **2.3 Source Oriented Network**

Historically, ADEQ has required several of the major point sources in the state to conduct ambient monitoring for criteria pollutants, primarily PM<sub>10</sub> and SO<sub>2</sub>, in and around the permitted facility. These monitors constitute a subset of the compliance monitoring network described above. ADEQ activities

with respect to this network have been limited to performance audits and review of ambient data summaries submitted by the individual sources. Recently, however, SIP support has required the submittal of data by some sources to the AQS, including review of quality assurance documents kept by the sources to support their ambient monitoring programs. ADEQ continues to work with the permitted facilities to obtain all ambient air quality data that are required to be reported to AQS. In 2012, a proposal was submitted to ASARCO and Freeport-McMoRan suggesting changes in the source SO<sub>2</sub> monitoring at their facilities at Hayden and Miami, respectively. These suggested changes involved ADEQ assuming additional monitoring responsibilities. Additional information is provided in the Source Compliance Monitoring Network Requirements section.

## **2.4 NCore Network**

EPA describes the nationwide NCore network composed of approximately 70 urban and 20 rural sites as a multipollutant network that integrates several advanced measurement systems for particles, pollutant gases, and meteorology. Some of the missions of the NCore network are:

- Tracking long-term trends of criteria and non-criteria pollutants;
- Support for long-term health assessments that contribute to ongoing reviews of the NAAQS;
- Support to scientific studies ranging across technological, health, and atmospheric process disciplines; and
- Support to ecosystem assessments recognizing that national air quality networks benefit ecosystem assessments and, in turn, benefit from data specifically designed to address ecosystem analyses.

As required under 40 CFR Part 58.13, ADEQ's NCore site (JLG Supersite) was operational by January 1, 2011. In addition to the above missions and the NCore monitoring requirements set forth in the CFR, ADEQ will use the JLG Supersite to test new technologies that may be adopted in various ADEQ monitoring networks. Examples would include advanced communications and serial data collection, remote span checks and calibrations, high sensitivity instrumentation, and instruments that monitor pollutants that may be added to the current CFR requirements. Additional NCore information is available from the EPA website: <http://www.epa.gov/ttn/amtic/ncore/index.html>

## **2.5 Meteorological Network**

ADEQ collects meteorological data at sites throughout the state to support the analysis of ambient air quality data and to provide support for exceptional event reporting. Meteorological measurements are also required for the NCore and PAMS networks. ADEQ currently meets the meteorological monitoring requirements for the NCore and PAMS networks. ADEQ intends to add meteorological instrumentation to most of ADEQ's monitoring sites that are not currently equipped. Additions will occur as time and funding permits. A priority list has been created to sequence the installations as materials and manpower become available.

## **2.6 Photochemical Assessment Monitoring Stations (PAMS)**

Section 182(c)(1) of the 1990 Clean Air Act (CAA) Amendments requires the Administrator to promulgate rules for enhanced monitoring of O<sub>3</sub> that includes concurrent monitoring of ozone, oxides of nitrogen (NO<sub>x</sub>), total reactive nitrogen (NO<sub>y</sub>), speciated volatile organic compounds (VOC), carbonyls,

CO, and meteorology to obtain comprehensive and representative O<sub>3</sub> data. Immediately following the promulgation of those rules, the affected states began to implement a program to improve ambient monitoring activities related to the precursors of ozone. Each SIP for the affected areas must contain commitments to implement the appropriate ambient monitoring network for such air pollutants. The subsequent revisions to 40 CFR 58 (1993) required states to establish PAMS as part of their SIP monitoring networks in O<sub>3</sub> non-attainment areas classified as serious, severe, or extreme. The principal reasons for requiring the collection of additional ambient air pollutant and meteorological data are the widespread non-attainment of the O<sub>3</sub> NAAQS and the need for a more comprehensive air quality database for O<sub>3</sub> and its precursors. ADEQ operates three PAMS sites, JLG Supersite (type 2), Queen Valley (type 3), and VEI (meteorological) to represent the Phoenix metropolitan area.

EPA has recently assembled a workgroup to evaluate the current PAMS program and consider the possible re-invention of the PAMS program. The scope of the evaluation was extensive and included PAMS objectives, network design, methods, and quality assurance. ADEQ participated in the PAMS re-invention process and will continue to follow this activity closely to be aware of possible future implications for the ADEQ network.

## **2.7 National Air Toxics Trend Sites (NATTS)**

The NATTS network was designed to monitor and record the concentrations of certain air toxics on a national scale. Data from EPA's national monitoring activities are used to estimate national average concentrations for these air toxics compounds and to detect trends. Using this information, EPA, states, and local agencies can estimate changes in the risks of human exposure. These changes can then be used to support changes in environmental policy. As part of the National Air Toxics Assessment (NATA) process, ambient air quality data are used to assess the national toxics inventory and long-term hazardous air pollutant (HAP) trends. ADEQ accepted federal funding and responsibility for this program in 2003. The ADEQ JLG Supersite is the designated NATTS site for Phoenix.

## **2.8 Chemical Speciation Network (CSN)**

The CSN was established to meet the regulatory requirements for monitoring speciated PM<sub>2.5</sub> to determine the chemical composition of these particles. The purpose of the CSN is to determine, over a period of several years, trends in concentration levels of selected ions, metals, carbon species, and organic compounds in the PM<sub>2.5</sub> samples collected at select sites throughout the country. The program began in 1999 with 54 Speciation Trends Network (STN) sites across the nation located primarily in or near larger MSAs. The network has increased to around 200 sites nationwide. Monitoring at JLG Supersite includes one STN speciation sampler and two IMPROVE samplers as part of the CSN network. The collocated IMPROVE samplers provide precision information for the IMPROVE network and are used for comparison of the speciation results from both programs. In 2009, a URG 3000N carbon sampler was added and data from that sampler was then used in place of the data from the Met One SASS carbon channel. This substitution was made as part of a national program designed to make the characteristics of the CSN carbon method match the IMPROVE carbon method more closely.

## **2.9 Class I Area Network and IMPROVE Program**

Visibility monitoring networks track impairment in specified national parks and wilderness areas. These parks and wilderness areas are called federally mandatory Class I areas (CIAs) and were designated based on an evaluation required by Congress in the 1977 federal CAA Amendments. The evaluation, which was performed by the United States Forest Service (USFS) and National Park Service (NPS), reviewed the areas of parks and national forests which were designated as wilderness before 1977, were more than 6,000 acres, and have visual air quality as an important resource for visitors. Of the 156 Class I Areas designated across the nation, 12 are located in Arizona. Nine sites are located in USFS areas and three in NPS areas. EPA initiated the nationally-operated IMPROVE monitoring network in 1987 whose purpose is to characterize broad regional trends and visibility conditions using monitoring data collected in or near Class I Wilderness Areas across the United States. In addition to the eleven Class I sites (two were combined in the past) ADEQ added six other IMPROVE sites identified as Protocol sites in the IMPROVE table in Appendix C. Refer to section 4.12 and the map in Appendix B for additional details regarding ADEQ's Class I Visibility and IMPROVE networks.

Due to budget constraints, ADEQ shut down the Class I nephelometer network in 2010. Over a decade of data were collected at several of these nephelometer sites. In early 2011, a draft summary report was written which summarizes the nephelometer data that were collected since 1997. The report provides comparisons of calculated visibility impairment between the IMPROVE aerosol monitors and collocated nephelometers. Summaries and trends in visibility data are also presented within the report, as well as meteorological data summaries in the form of wind roses. This report is meant to serve as a final data summary for the Class I Nephelometer network. Information from this report may be utilized in the future if further modifications are needed to the Arizona Class I visibility network.

## **2.10 AIRNow Reporting**

ADEQ has recently renewed efforts to provide data to the AIRNow system and has been successful in transferring some data to AIRNow via their new AQCSV file format. Data currently being submitted to AIRNow on a near-real time basis include, ozone, continuous PM<sub>10</sub> and PM<sub>2.5</sub>, and SO<sub>2</sub> data. ADEQ will continue their efforts in expanding their data submission to AIRNow to support air quality forecasting and near-real time data reporting. Appendix C contains an indication of whether data from specific monitors and sites are submitting data to AIRNow.

## **2.11 Urban Haze Network**

Historically, ADEQ operated an urban haze network in the Phoenix and Tucson metropolitan areas. The purpose of the networks is to provide policy-makers and the public with information regarding urban haze levels, track short-term and long-term urban haze trends, assess source contributions to urban haze, and better evaluate the effectiveness of air pollution control strategies on urban haze. Equipment used to evaluate urban visibility includes transmissometers, nephelometers, particulate monitors, and digital camera systems. A wealth of urban visibility related data and information have been collected for more than a decade in both the Phoenix and Tucson area. In 2010, due to budget cuts, this non-mandatory program was reduced to operate in the Phoenix Metropolitan Area only. This network includes digital cameras, nephelometers, and transmissometer. Additional details regarding ADEQ's Urban Haze Network can be found in section 4.13.

## 2.12 E-BAM Network of PM<sub>2.5</sub> Special Purpose Monitors

The current network of E-BAM continuous particulate special purpose monitors (listed in Table 2.12-1) is composed of lightweight, portable monitors typically enclosed in self-contained, environmentally sealed containers. They can be battery or solar powered for operation at sites without fixed electrical power. E-BAMs continuously sample and report particulate concentrations. Data are sampled every second and concentrations recorded every minute. E-BAM monitors have been used by many agencies, particularly in the western United States, to provide continuous, real-time particulate concentration data that are useful for making informed smoke management decisions related to prescribed burns. E-BAM instruments are used for special purpose monitoring only. They are not classified as FRMs or FEMs and may not be used to demonstrate NAAQS compliance. ADEQ uses these monitors primarily to monitor populated areas that could be impacted by prescribed burns and wildfires. Historically, ADEQ's E-BAM monitors have been configured to measure particles  $\leq 10$  microns in diameter (PM<sub>10</sub>). To get a better understanding of smoke impacts in these smaller communities, ADEQ changed the configuration in 2011 of these monitors to measure only particles PM<sub>2.5</sub>. Hourly data from the E-BAM monitors can be viewed at: <http://www.phoenixvis.net/PPMmain.aspx>.

**Table 2.12-1 Location of E-BAM Monitors**

Site Name	Address
Flagstaff Middle School	755 N. Bonito, Flagstaff, AZ 86001
Prescott College AQD	336 Grove Ave., Prescott, AZ 86301
Sedona Fire Station AQD	310 Forest Road, Sedona, AZ, 86336
Show Low	561 E. Deuce of Clubs, Show Low, AZ 85901
Springerville	323 S. Mountain Ave., Springerville, AZ 85936
Verde Ranger Station	300 E. Highway 260, Camp Verde, AZ 86322

## 2.13 Arizona / Mexico Border Network

Historically, ADEQ has been involved in ambient air quality monitoring along the Arizona / Mexico border. Initially, ADEQ conducted particulate monitoring on both sides of the border. In 2008, due to changes in federal regulations regarding documentation needed to cross the border, ADEQ staff were not permitted to cross the border into Mexico. As a result, ADEQ's direct involvement with ambient air quality monitoring in Mexico was reduced. In its place, ADEQ relied upon contractors to perform the monitoring on the Mexico side of the border. Due to recent budget constraints by both ADEQ and EPA, this program could no longer be funded. As a result, the Agua Prieta Fire Station, Sonora Nogales Fire Station, and San Luis Rio Colorado monitoring sites were closed in June 2011. Currently, ADEQ is working with the EPA Border Program as part of the U.S. – Mexico Border Air Policy Forum and the Air Monitoring Working Group. This working group will review the air quality monitoring data and air monitoring networks in rural and urban areas along the border and evaluate the adequacy of these networks to identify operational and maintenance needs, plan for future capabilities, and develop recommendations to resolve any inadequacies. Through this effort, relationships between EPA, ADEQ, Secretariat of Environment and Natural Resources (SEMARNAT), and Commission for Ecology and Sustainable Development (CEDES) are expected to develop, such that data can be shared across the border and capacity can be built to meet the needs of each of the air monitoring program objectives.

### 3.0 MONITORING NETWORK EVALUATION

This section provides a summary of the changes in ADEQ's current monitoring network that have taken place since the 2011 Network Plan was issued as well as changes planned for the next 18 months. While future changes cannot always be anticipated due to unforeseen circumstances, ADEQ puts forth an extensive effort to document plans for future changes throughout the monitoring network. In the instances that unforeseen changes occur to the monitoring network, these changes will always be documented as having occurred via the network plan. A summary of the changes are listed below. Specific details regarding these changes can be found in their respective sections within Section 4.

#### 3.1 Site Closures

Prescott College AQD – The site may be closed following the 2012 ozone season. It does not meet siting requirements because of the close proximity to tall trees and to a nearby road with a high traffic count. These conditions make the Prescott College AQD site unsuitable for continued, long-term placement of the O<sub>3</sub> monitor. In addition, environmental control issues (the O<sub>3</sub> instrument is in a room at the college that may not be temperature-controlled in summer months) have impacted the operation of the seasonal O<sub>3</sub> monitor. A search for a suitable site will continue in 2012. ADEQ plans to run O<sub>3</sub> monitors at the current Prescott site and at an additional site in Prescott during a portion of the 2012 O<sub>3</sub> season so that data from the two sites can be compared. A potential site has been identified at a Prescott Parks Maintenance building located in the vicinity of Embry Riddle University at 3700 Willow Creek Road in Prescott (ZIP 86301). An E-BAM monitor is also located at the Prescott College site. At this time, it is not known if this E-BAM monitor will be removed along with the O<sub>3</sub> monitor.

Mexico Sites – Due to budget constraints by both ADEQ and EPA, the Agua Prieta Fire Station, Sonora Nogales Fire Station, and San Luis Rio Colorado monitoring sites were closed in June 2011. ADEQ is working with the EPA Border Program as part of the U.S. – Mexico Border Air Policy Forum and the Air Monitoring Working Group. This working group will review the air quality monitoring data and air monitoring networks in rural and urban areas along the border and evaluate the adequacy of these networks to identify operational and maintenance needs, plan for future capabilities, and develop recommendations to resolve any inadequacies.

Sedona Post Office – Due to concerns about local emissions affecting the PM<sub>2.5</sub> EBAM monitor, a new site was established in Sedona and the Sedona Post Office site was discontinued. Several sites were evaluated with temporary monitors. A location at a Fire Station was determined to be most representative and best suited to house the PM<sub>2.5</sub> EBAM monitor.

Paul Spur Chemical Lime Plant South – In an effort to consolidate meteorological and PM instrumentation near the lime plant at Paul Spur, the previously existing meteorological station was discontinued and the meteorological instrumentation was moved to the same location as the PM<sub>10</sub> instruments.

Miami Ridgeline – ADEQ is in the beginning stages of transitioning the Miami, AZ area sites to operation by ADEQ staff. As a result, two additional SO<sub>2</sub> sites and one additional PM<sub>10</sub> site will be operated by ADEQ. With the addition of these sites, ADEQ is proposing to discontinue the Miami

Ridgeline site. The exact timing of this is not known and this process may take some time due to the complex nature of such an action. Additional details may be found in Section 4.

### **3.2 New Sites**

Replacement for Prescott College AQD – An O<sub>3</sub> monitor will be located at a new site in Prescott. The current site does not meet siting requirements because of the close proximity to tall trees and to a nearby road with a high traffic count. In addition, environmental control issues have impacted the operation of the seasonal O<sub>3</sub> monitor. A potential site has been identified at a Prescott Parks Maintenance building located in the vicinity of Embry Riddle University at 3700 Willow Creek Road in Prescott (ZIP 86301). It is ADEQ's goal to run O<sub>3</sub> monitors at the two sites in Prescott during a portion of the 2012 O<sub>3</sub> season so that data from the two sites can be compared.

Sedona Fire Station AQD – Due to concerns about local emissions affecting the PM<sub>2.5</sub> EBAM monitor that was previously located at a Post Office, a new site was established in Sedona. Several sites were evaluated with temporary monitors. A location at a Fire Station was determined to be most representative and best suited to house the PM<sub>2.5</sub> EBAM monitor.

Miami, AZ area sites – ADEQ is in the beginning stages of transitioning the Miami, AZ area sites to operation by ADEQ staff. As a result, two additional SO<sub>2</sub> sites and one additional PM<sub>10</sub> site will be operated by ADEQ. These new sites include Jones Ranch and Miami Townsite for SO<sub>2</sub> and Miami Golf Course for PM<sub>10</sub>. Additional details may be found in Section 4.

### **3.3 Instrument Changes**

Paul Spur Chemical Lime Plant PM<sub>10</sub> – The collocated Partisol 2000 instruments were replaced by a continuous TEOM instrument at the beginning of 2012. This reduced the filter-based PM<sub>10</sub> network to six sites which reduced the required number of collocated PM<sub>10</sub> sites to one which is currently Payson Well Site.

Paul Spur Chemical Lime Plant Meteorology – In an effort to consolidate meteorological and PM instrumentation near the lime plant at Paul Spur, the previously existing meteorological station was discontinued and the meteorological instrumentation was moved to the same location as the PM<sub>10</sub> instruments. Additionally, in an attempt to standardize meteorological measurements at ADEQ sites, a temperature / relative humidity probe was installed at the new site to accompany the existing anemometer.

JLG Supersite PM<sub>10</sub>, and PM<sub>2.5</sub> TEOMs – The PM<sub>2.5</sub> FDMS TEOM and the PM<sub>10</sub> TEOM instruments will be removed at the end of June 2012. Simultaneous TEOM and BAM monitoring was warranted for a period of time to assess the comparability between the two instrument types.

JLG Supersite Pb – Recent revisions to the Pb monitoring rule required Pb monitoring at NCore sites that are located within a combined statistical area (CBSA) with a population greater than 500,000. The Phoenix CBSA meets this population requirement, therefore, Pb monitoring is required at ADEQ's NCore site (JLG Supersite). Currently, a PM<sub>10</sub> low volume sampler produces Pb results as part of the NATTS PM<sub>10</sub> Metals program. ERG recently obtained approval of their ICP-MS analysis method for Pb

and will report the Pb concentrations as part of the NAAQS requirement. It is important to note that no physical changes in instrumentation or analysis method will have been made.

Miami Golf Course PM<sub>10</sub> – ADEQ plans to install a continuous PM<sub>10</sub> TEOM at the Miami Golf Course site in Miami, AZ. The PM instrumentation at this site has historically been operated by Freeport McMoRan. The exact date of installment is not known, but should occur prior to the start of 2013. The data generated from this TEOM will be reported to EPA's AQS database and serve as the official NAAQS compliance data for the Miami, AZ planning area.

Bullhead City PM<sub>10</sub> – ADEQ anticipates replacing the Partisol 2000 PM<sub>10</sub> instrument with a continuous PM<sub>10</sub> TEOM. There's also a possibility that a new site may be needed due to some uncertainties at the current Post Office. Logistics are currently being evaluated and a definitive date for replacement has not been determined.

Douglas Red Cross PM<sub>10</sub> & PM<sub>2.5</sub> – ADEQ anticipates replacing the Partisol PM<sub>10</sub> and PM<sub>2.5</sub> instruments with continuous PM instruments. ADEQ is still evaluating which continuous PM<sub>2.5</sub> monitoring method to use, and the decision may impact the continuous PM<sub>10</sub> method selected for the Douglas Red Cross site.

Nogales Post Office Meteorology – In an attempt to standardize meteorological measurements at ADEQ sites, a temperature / relative humidity probe was added to the Nogales Post Office site in August, 2011, which previously only contained an anemometer for measurements of wind speed and direction.

Ajo Meteorology – In an attempt to standardize meteorological measurements at ADEQ sites, a temperature / relative humidity probe may be added to the Ajo site which currently only contains an anemometer for measurements of wind speed and direction.

### 3.4 Summary of Network Changes

**Table 3.4-1 Instruments Closed in 2011-2012 or to be Closed in 2012-2013**

Site Name	AQS ID	Classification	Scale	Monitor Objective	Parameter(s) Measured	Report to AQS	Reason for Monitor Closure
JLG Supersite	04-013-9997	SLAMS/NCore	Neighborhood	Population	PM <sub>10</sub> , PM <sub>2.5</sub>	Yes	PM <sub>2.5</sub> FDMS TEOM and PM <sub>10</sub> TEOM replaced by NCore BAMS monitors
Paul Spur Chemical Lime Plant	04-003-0011	SLAMS	Middle	Source	PM <sub>10</sub>	Yes	Collocated Partisol 2000 PM <sub>10</sub> instruments replaced by PM <sub>10</sub> TEOM
Paul Spur Chemical Lime Plant South	NA	SLAMS	Middle	Source	Wind	No	Meteorology moved from Paul Spur Chemical Lime Plant South site to Paul Spur Chemical Lime Plant.
Sedona Post Office	04-005-1010	SPM	Neighborhood	Population	PM <sub>2.5</sub> EBAM	No	Adverse affect of local emissions. Site moved to Sedona Fire Station AQD
Prescott College AQD	04-025-8033	SLAMS	Neighborhood	Population	O <sub>3</sub>	Yes	Site does not meet EPA siting requirements
Bullhead City	04-015-1003	SLAMS	Neighborhood	Population	PM <sub>10</sub>	Yes	Partisol 2000 FRM anticipated to be replaced by a continuous instrument
Miami Ridgeline	04-007-0009	SLAMS	Neighborhood	Source	SO <sub>2</sub> , PM <sub>10</sub>	Yes	Proposing to close site. Associated with transition to ADEQ operation of Miami monitors
Agua Prieta Fire Station	80-26-1000	SPM	Neighborhood	Transport	PM <sub>10</sub> , PM <sub>2.5</sub>	Yes	Funds not available for continued operation
San Luis Rio Colorado	80-26-8012	SPM	Neighborhood	Transport	PM <sub>10</sub> , PM <sub>2.5</sub>	Yes	Funds not available for continued operation
Sonora Nogales Fire Station	80-26-0005	SPM	Neighborhood	Transport	PM <sub>10</sub> , PM <sub>2.5</sub>	Yes	Funds not available for continued operation

**Table 3.4-2 Instruments Added in 2011-2012 or to be Added in 2012-2013**

Site/City Name	AQS ID	Classification	Scale	Objective	Parameter(s) Measured	Report to AQS	Reason for Monitor Addition
Prescott MSA	NA	SLAMS	Urban or Neighborhood	Population	O <sub>3</sub>	Yes	Replacement for Prescott College AQD
Paul Spur Chemical Lime Plant	04-003-0011	SLAMS	Middle	Source	PM <sub>10</sub> , Met	Yes	PM <sub>10</sub> TEOM replaced collocated Partisol 2000 PM <sub>10</sub> instrument. Met added replacing instruments from nearby site.
Douglas Red Cross	04-003-1005	SLAMS	Neighborhood	Population	PM <sub>10</sub> , PM <sub>2.5</sub>	Yes	Continuous PM <sub>10</sub> and PM <sub>2.5</sub> instruments anticipated to replace filter-based Partisol 2000s.
Bullhead City	04-015-1003	SLAMS	Neighborhood	Population	PM <sub>10</sub>	Yes	Continuous PM <sub>10</sub> anticipated to replace Partisol 2000 FRM
Miami Golf Course	04-007-8000	SLAMS	Neighborhood	Population	PM <sub>10</sub>	Yes	Install TEOM as part of transition from Freeport McMoRan to ADEQ operation

<b>Site/City Name</b>	<b>AQS ID</b>	<b>Classification</b>	<b>Scale</b>	<b>Objective</b>	<b>Parameter(s) Measured</b>	<b>Report to AQS</b>	<b>Reason for Monitor Addition</b>
Miami Townsite	NA	SLAMS	Neighborhood	Population	SO <sub>2</sub>	Yes	Install SO <sub>2</sub> analyzer as part of transition from Freeport McMoRan to ADEQ operation
Jones Ranch	NA	SLAMS	Middle	Source	SO <sub>2</sub>	Yes	Install SO <sub>2</sub> analyzer as part of transition from Freeport McMoRan to ADEQ operation
Sedona Fire Station AQD	NA	SPM	Neighborhood	Population	PM <sub>2.5</sub> EBAM	No	Site moved to Sedona Fire Station AQD from Sedona Post Office
Nogales Post Office	04-023-0004	SLAMS	Neighborhood	Population	TEMP/RH	No	TEMP/RH probe added to conform to ADEQ Met standards
Ajo	04-019-0001	SLAMS	Neighborhood	Source	TEMP/RH	No	TEMP/RH probe anticipated to be added to existing site.

#### 4.0 ADEQ MONITORING NETWORKS

Minimum monitoring requirements for the number of sites in SLAMS networks (including PAMS and NCore) are described in 40 CFR Part 58 Appendix D and are typically based on the population of urban areas. As EPA reviews the NAAQS for each of the criteria pollutants, additional monitoring requirements for these pollutants may be added. The additional requirements may be based on population or a combination of population and some other metric, such as design values, traffic counts, or emission inventories. Additional monitoring requirements may also be based solely on the discretion of the EPA Regional Administration to adequately assess air quality for sensitive population groups. Currently, minimum monitoring requirements are only associated with MSAs, and there are no minimum monitoring requirements for Micropolitan Statistical Areas.

**Table 4.0-1 Metropolitan Statistical Areas As of the July 2010 Census**

Metropolitan Statistical Area	Area included	Population
Flagstaff	Coconino County	134,421
Lake Havasu City – Kingman	Mohave County	200,186
Phoenix – Mesa – Scottsdale	Maricopa & Pinal Counties	4,192,887
Prescott	Yavapai County	211,033
Tucson	Pima County	980,263
Yuma	Yuma County	195,751

**Table 4.0-2 Micropolitan Statistical Areas As of the July 2010 Census**

Micropolitan Statistical Area	County	Population
Nogales	Santa Cruz	47,420
Payson	Gila	53,597
Safford	Graham	45,657
Show Low	Navajo	107,449
Sierra Vista-Douglas	Cochise	131,346

#### 4.1 PM<sub>2.5</sub> Monitoring Network Requirements

The number of PM<sub>2.5</sub> samplers required in urban areas is based on population (see Table 4.0-1) and design values for PM<sub>2.5</sub> concentrations (see Table 4.1-2).

**Table 4.1-1 Minimum Number of PM<sub>2.5</sub> Monitors Required (40 CFR 58 Appendix D)**

Population (MSA)	Most recent 3 yr design value $\geq$ 85% of any PM <sub>2.5</sub> NAAQS *	Most recent 3 yr design value <85% of any PM <sub>2.5</sub> NAAQS *
>1,000,000	3	2
500,000 – 1,000,000	2	1
50,000 – 500,000	1	0

\* 85% of Annual NAAQS (15  $\mu\text{g}/\text{m}^3$ ) = 12.75  $\mu\text{g}/\text{m}^3$ ; 85% of 24-Hour NAAQS (35  $\mu\text{g}/\text{m}^3$ ) = 29.75  $\mu\text{g}/\text{m}^3$

The required sample collection frequency is based on the type of sampler and the design value calculated from data collected at each FRM (filter-based) or FEM (continuous) sampler (see Table 4.1-2). 40 CFR Part 58.12 (d)(1) states the manual PM<sub>2.5</sub> sample collection frequency requirement at required SLAMS stations as every third day at sites without a collocated continuously operating PM<sub>2.5</sub> monitor. For SLAMS PM<sub>2.5</sub> sites with manual and continuous PM<sub>2.5</sub> monitors, the agency may request approval from the EPA Regional Administrator for a reduction to every sixth day and/or seasonal sampling schedule. However, in response to EPA's approval letter for the 2011 Network Plan, ADEQ intends to clarify the sampling schedules for PM<sub>2.5</sub> FRM monitors.

**Table 4.1-2 PM<sub>2.5</sub> Design Values and Sampling Frequencies at ADEQ FRM/FEM Sites**

Site Name	2009-2011 24-Hour Design Value (µg/m <sup>3</sup> )	2009-2011 Annual Design Value (µg/m <sup>3</sup> )	Current Sample Frequency	Required Frequency
Douglas Red Cross	13	7.0	1 in 6	1 in 3
Flagstaff Middle School	14	5.9	1 in 6	1 in 6
JLG Supersite	21	8.2	1 in 3	1 in 3
Nogales Post Office	30	11.1	1 in 6	1 in 6
Prescott Valley*	10	4.3	1 in 6	1 in 6
Yuma Supersite*	15	7.5	1 in 6	1 in 6

\* Indicates SPM monitor

ADEQ currently operates EPA-approved FRM samplers at six PM<sub>2.5</sub> monitoring sites. In addition to the PM<sub>2.5</sub> FRM at JLG Supersite, ADEQ also operates an EPA-approved FEM continuous monitor at this site to fulfill NCore requirements. The FRM sampler is considered the primary monitor for PM<sub>2.5</sub> NAAQS compliance purposes. Several non-FEM continuous PM<sub>2.5</sub> monitors are also in operation throughout the state, most of which are associated with the Smoke Management EBAM network. See Section 2.12 for additional details on the EBAM network.

#### Monitor Type and Sample Schedule Clarification

ADEQ operates two collocated Partisol 2000 PM<sub>2.5</sub> FRM instruments and a PM<sub>2.5</sub> non-FEM BAM continuous instrument at the Nogales Post Office site. This combination of instruments along with Regional Administrator approval results in a 1-in-6 day monitoring frequency requirement for the FRM instrument(s). ADEQ may replace the non-FEM continuous instrument with an FEM continuous instrument in the future, but until then, plans to maintain the same configuration that is currently in place at the Nogales Post Office site. ADEQ operates a PM<sub>2.5</sub> FRM instrument at Flagstaff Middle School on a 1-in-6 sampling schedule. ADEQ may re-evaluate the need for a PM<sub>2.5</sub> monitor at Flagstaff Middle school due to the long history of low concentrations. at this site. Until then, ADEQ plans to continue operating the FRM sampler on a 1-in-6 sampling schedule due to the collocated continuous non-FEM monitor that is in place as part of the EBAM network.

The Prescott Valley and Yuma Supersite PM<sub>2.5</sub> monitors are special purpose monitors and as a result, can operate on the 1-in-6 day sampling schedule. These monitors had been mistakenly labeled as SLAMS monitors in previous network plans. As part of the 2012 network plan, ADEQ's intent is to clarify these monitors as SPMs. The initial designation of these monitors as SPMs occurred in the 2007

network plan. In the coming years, ADEQ plans to evaluate the data at these sites to determine if future monitoring is warranted. PM<sub>2.5</sub> concentrations have been low at both sites, particularly at Prescott Valley. Considering the above clarifications, as can be seen from Table 4.1-2, the only PM<sub>2.5</sub> FRM monitor that does not meet the sample frequency requirement is the Douglas Red Cross site. ADEQ plans to replace the Douglas Red Cross filter-based instrument with an FEM continuous instrument following the availability of additional 103 funds. For additional details of the PM<sub>2.5</sub> network and associated sample schedules, see Appendix G for a copy of the letter to EPA Region 9 requesting approval.

SLAMS Sites with design values  $\pm 10$  percent of 35 $\mu\text{g}/\text{m}^3$  (31.5 to 38.5 $\mu\text{g}/\text{m}^3$ ) and sites where 24-hour values exceed the NAAQS for three consecutive years require an every third day frequency. Sites within  $\pm 5\%$  of 35 $\mu\text{g}/\text{m}^3$  (33.25 to 36.75 $\mu\text{g}/\text{m}^3$ ) need to operate on a daily schedule. At a minimum, operating frequencies of ADEQ PM<sub>2.5</sub> monitors will be evaluated every five years as part of the Five Year Network Assessment. More frequent evaluations may occur, which would be addressed in the annual monitoring network plan.

#### 4.1.1 PM<sub>2.5</sub> Collocation Requirements

Table 4.1-3 summarizes ADEQ's PM<sub>2.5</sub> collocation requirements. As can be seen in the table, only one collocated site is needed for the ADEQ PM<sub>2.5</sub> network. This site is the Nogales Post Office Site, which is the highest PM<sub>2.5</sub> design value site in the ADEQ PM<sub>2.5</sub> network. While ADEQ does operate one continuous FEM monitor at the JLG Supersite, this monitor is not the primary monitor and therefore, does not require a collocated FRM. However, due to NCore requirements, a PM<sub>2.5</sub> FRM is located at this site also. The JLG Supersite continuous PM<sub>2.5</sub> FEM monitor is labeled as both an NCore monitor as well as a QA Collocated monitor for the FRM primary monitor. While the methods are different, value is still gained by evaluating data from these collocated monitors.

**Table 4.1-3 PM<sub>2.5</sub> FRM/FEM Collocation Details**

Method Code	# of Sites	# of Primary Monitors	# of Required Collocated Monitors	# of Active Collocated Monitors
143 (Partisol 2000)	6	6	1	2 <sup>1</sup>
170 (Met One BAM 1020)	1	0	0	1 <sup>2</sup>

<sup>1</sup> One site contains collocated monitors of the same method (Nogales Post Office) while one contains collocated monitors of differing methods (JLG Supersite)

<sup>2</sup> Collocation is of differing methods (JLG Supersite)

#### 4.1.2 Compliance with 40 CFR Part 58.10 (c)

A process for relocating violating PM<sub>2.5</sub> monitors is described in 40 CFR Part 58.10 (c). It requires the annual monitoring network plan to document how state and local agencies provide for the review of changes to a PM<sub>2.5</sub> monitoring network that impact the location of a violating PM<sub>2.5</sub> monitor or the creation/change to a community monitoring zone, including a description of the proposed use of spatial averaging for purposes of making comparisons to the annual PM<sub>2.5</sub> NAAQS as set forth in Appendix N

to Part 50. The affected agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

ADEQ does not intend to establish community monitoring zones as described in the rule or utilize spatial averaging for comparison to the PM<sub>2.5</sub> NAAQS. A public comment procedure is required prior to relocation of a violating monitor and ADEQ will utilize the following procedure:

1. Evaluation of the potential replacement site will include review and comparison of available pollutant data, meteorology, climatology, terrain, and siting characteristics. This information will be documented in a brief report.
2. Make notice of such a change in the annual monitoring network plan.
3. If the change must be accomplished prior to annual monitoring network plan submittal, ADEQ will make appropriate notice via the agency Web page and invite participation from the public prior to relocation of the affected site.
4. Relocation of the monitor.

#### 4.2 PM<sub>10</sub> Monitoring Network Requirements

The number of PM<sub>10</sub> samplers required in urban areas is based on population (see Table 4.2-1) and design values for PM<sub>10</sub> 24-hour concentrations (see Table 4.2-2). Maricopa, Pinal, and Pima Counties have delegation authority for their monitoring networks and AQS reporting. ADEQ's PM<sub>10</sub> monitoring network includes the MSAs in all other Arizona counties, as well as the PM<sub>10</sub> non-attainment areas in those counties. ADEQ operates a PM<sub>coarse</sub> monitor (difference method using BAM instruments) in the Phoenix metropolitan area at the JLG Supersite NCore site. PM<sub>10</sub> concentrations are available from the PM<sub>10</sub> BAM instrument to support the multipollutant measurements at that site.

**Table 4.2-1 Minimum Number of PM<sub>10</sub> Monitors Required (40 CFR 58 Appendix D)**

<b>Population (MSA)</b>	<b>High Concentration Exceeds 24-Hour NAAQS by 20% or more (&gt;180µg/m<sup>3</sup>)</b>	<b>Medium Concentration Exceeds 80% of 24-Hour NAAQS (&gt;120µg/m<sup>3</sup>)</b>	<b>Low Concentration Less than 80% of 24-Hour NAAQS (&lt;120 µg/m<sup>3</sup>)</b>
>1,000,000	6-10	4-8	2-4
500,000 – 1,000,000	4-8	2-4	1-2
250,000 – 500,000	3-4	1-2	0-1
100,000 – 250,000	1-2	0-1	0

The monitoring rule in 40 CFR Part 58.12 (e) states that for PM<sub>10</sub> sites, "...the minimum monitoring schedule for the site in the area of expected maximum concentration shall be based on the relative level of that monitoring site concentration with respect to the 24-hour standard." In rural areas of Arizona where there is only one PM<sub>10</sub> monitor to represent the area, such as Ajo, Hayden, and Yuma, sites can be considered de facto maximum-concentration sites whose operating frequencies must be determined using the Ratio-to-Standard diagram in 40 CFR Part 58.12 (e). Due to the variability in PM<sub>10</sub> concentrations from year to year throughout Arizona, the operating frequencies of ADEQ PM<sub>10</sub> monitors will be evaluated every five years as part of the Five Year Network Assessment. In response to the PM<sub>10</sub> sampling frequency comments raised in EPA's approval letter of ADEQ's 2011 Network Plan,

PM<sub>10</sub> sample frequencies are specifically addressed in this year's plan. Table 4.2-2 provides the maximum 24-hour concentration and the 'design value to NAAQS ratio' for each site as was published in the 2010 Network Plan, as well as updated information using the most recent data (2009-2011). As can be seen in the table, four of the twelve sites experienced a change in the required sampling frequency over the two year period. Two sites would have required more frequent sampling while two would have required less frequent sampling. Based on the recommended methodology used to assess PM<sub>10</sub> sample frequencies, the changes in required sampling frequencies that would occur on a year to year basis make it impractical to assess and implement sample frequency changes as part of the annual monitoring network plan. As a result, ADEQ has confirmed that the Five Year Network Assessment will be a better tool to assess sampling frequencies throughout the PM<sub>10</sub> network. Additionally, ADEQ's general trend towards continuous PM<sub>10</sub> monitoring should alleviate some of these concerns in the future. Taking into consideration the recent changes to the PM<sub>10</sub> network and planned changes to occur in the next year, all sites now meet or exceed the sample frequency requirement as determined from both evaluations.

In recent years, ADEQ has transitioned several PM<sub>10</sub> monitors from filter-based methods to continuous methods. As stated in ADEQ's Five Year Network Assessment, this transition to continuous PM<sub>10</sub> samplers continues to be a focus for ADEQ. As a continuation of this effort, replacing the filter-based PM<sub>10</sub> monitors in Bullhead City and Douglas Red Cross is being evaluated and will likely occur within the next six to twelve months. In addition to these planned changes, ADEQ is also currently negotiating with Freeport McMoRan in the Miami, AZ area to install and operate a continuous PM<sub>10</sub> TEOM at the Miami Golf Course site. The PM<sub>10</sub> monitor at this site has previously been operated by Freeport McMoRan. With the operation of a PM<sub>10</sub> monitor by ADEQ staff, the data can be more efficiently loaded to the ADEQ internal database, and ultimately reported to EPA's AQS database in a timely manner. Due to potential changes in the SO<sub>2</sub> network, ADEQ is also proposing that Freeport McMoRan discontinue PM<sub>10</sub> monitoring at the Miami Ridgeline site as the Miami Golf Course site represents maximum concentrations in the Miami area. For additional details on these proposed changes to the PM<sub>10</sub> network, see Appendix H for a copy of the letter to EPA Region 9 requesting approval.

Table 4.2-3 shows the most recent design values for all sites within ADEQ's PM<sub>10</sub> network. Due to the large number of exceptional events that have occurred over the last several years, two separate design value scenarios are provided. Additionally, due to changes from filter-based to continuous monitors at several sites, PM<sub>10</sub> data from different instrumentation were merged at some sites to calculate the expected number of exceedances over the three-year period.

**Table 4.2-2 PM<sub>10</sub> Maximum Values and Sampling Frequencies for ADEQ Monitors**

Site Name	2007-2009 Max (µg/m <sup>3</sup> )	Ratio	2009-2011 Max (µg/m <sup>3</sup> )	Ratio	Current Sample Frequency	Required Frequency	
						2010 Network Plan	2012 Network Plan
Ajo	153	1.02	213	1.42	Continuous	Every Day	1 in 6
Bullhead City	98	0.65	132	0.88	1 in 6	1 in 6	Every Other Day
Douglas Red Cross	97	0.65	138	0.92	1 in 6	1 in 6	Every Day
Flagstaff Middle School	56	0.37	61	0.40	1 in 6	1 in 6	1 in 6
Hayden Old Jail	225	1.50	225	1.50	Continuous	1 in 6	1 in 6
JLG Supersite	521	3.47	331	2.20	Continuous	1 in 6	1 in 6
Nogales Post Office	238	1.58	238	1.58	1 in 6 and Continuous	1 in 6	1 in 6
Paul Spur Chemical Lime Plant	159	1.06	85	0.56	Continuous	Every Day	1 in 6
Payson Well Site	61	0.41	42	0.28	1 in 6	1 in 6	1 in 6
Prescott Valley	63	0.42	90	0.60	1 in 6	1 in 6	1 in 6
Rillito	208	1.39	242	1.61	Continuous	1 in 6	1 in 6
Yuma	386	2.57	306	2.04	Continuous	1 in 6	1 in 6

**Table 4.2-3 PM<sub>10</sub> Design Values (Estimated Exceedances) and Annual Means for ADEQ Sites**

Site Name	2009-2011 Estimated Days PM <sub>10</sub> >150 µg/m <sup>3</sup> Including Events	2009-2011 Estimated Days PM <sub>10</sub> >150 µg/m <sup>3</sup> Excluding Events	2011 Annual Mean Concentration µg/m <sup>3</sup>
Ajo <sup>1</sup>	1.4	0	29.0
Bullhead City	0	0	15.4
Douglas Red Cross *	0	0	34.5
Flagstaff Middle School	0	0	15.7
Hayden Old Jail <sup>1</sup>	1.0	0	40.5
JLG Supersite	2.0	0	34.3
Nogales Post Office FRM	0	0	39.7
Nogales Post Office Continuous	4.2	3.5	54.2
Paul Spur Chemical Lime Plant	0	0	23.2
Payson Well Site	0	0	18.0
Prescott Valley	0	0	11.4
Rillito <sup>1</sup>	2.0	0	41.9
Yuma Supersite <sup>2</sup>	2.7	0	29.8

<sup>1</sup> Filter-based and continuous records merged to calculate design value

<sup>2</sup> Continuous records from Yuma Courthouse and Yuma Supersite merged to calculate design value

\* Design Value does not meet data completeness criteria

#### 4.2.1 PM<sub>10</sub> Collocation Requirements

Table 4.2-1 summarizes ADEQ's PM<sub>10</sub> collocation requirements. As can be seen in the table, only one collocated site is needed for the ADEQ PM<sub>10</sub> network. This site is the Payson Well Site. While the Payson Well Site annual mean is not within the highest 25% of the PM<sub>10</sub> FRM network, the highest site (Nogales Post Office) is collocated with a PM<sub>10</sub> BAM monitor. The Payson Well Site is the third highest of the PM<sub>10</sub> FRM network. In addition to the one required collocated site, ADEQ operates two additional sites with collocated PM<sub>10</sub> instruments, although one of these sites (JLG Supersite) will be reduced to one PM<sub>10</sub> monitor in the near future. While the methods are different, value is still gained by evaluating data from these collocated monitors.

**Table 4.2-4 PM<sub>10</sub> FRM/FEM Collocation Details**

Method Code	# of Sites	# of Primary Monitors	# of Required Collocated Monitors	# of Active Collocated Monitors
126 (Partisol 2000)	6	6	1	2 <sup>1</sup>
079 (TEOM)	6	5	0	1 <sup>2</sup>
122 (BAM)	2	1	0	1 <sup>2</sup>

<sup>1</sup> One site contains collocated monitors of the same method (Payson Well Site) while one contains collocated monitors of differing methods (Nogales Post Office)

<sup>2</sup> Collocation is of differing methods (Nogales Post Office FRM & BAM; JLG Supersite BAM & TEOM)

### 4.3 O<sub>3</sub> Monitoring Network Requirements

The minimum monitoring requirements for O<sub>3</sub> are shown below in Table 4.3-1. In September 2011, the EPA indicated that they would uphold their original 2008 decision to set the eight-hour NAAQS at 0.075 ppm. The EPA has also indicated that the proposed monitoring rule issued in July 2009, would likely not move forward on several fronts. Unlike previous network plans, ADEQ will not include the 2009 proposed monitoring rule in their network plan evaluation for 2012. As a result, ADEQ is no longer considering installing an ozone monitor within the Lake Havasu / Kingman MSA. If future monitoring rules require such a monitor, ADEQ will re-evaluate the ozone network.

**Table 4.3-1 Minimum Number of O<sub>3</sub> Monitors Required (40 CFR 58 Appendix D)**

Population (MSA)	Most recent 3 year 8-hour Design Value $\geq$ 85% of NAAQS (0.075 ppm) or no Design Value available	Most recent 3 year 8-hour Design Value <85% NAAQS (0.075 ppm)
>10 Million	4	2
4-10 Million	3	1
350,000 - 4 Million	2	1
50,000 – 350,000	1	0

ADEQ operates a network of seven O<sub>3</sub> monitors throughout Arizona (see Table 4.3-2). Authority to operate O<sub>3</sub> monitors has been delegated to Maricopa, Pima, and Pinal counties. ADEQ will be relocating the Prescott College AQD monitor following the 2012 O<sub>3</sub> season due to siting requirements. Prior to the 2011 O<sub>3</sub> season, ADEQ upgraded their O<sub>3</sub> monitoring network by replacing the Thermo 43C analyzers with newer API Teledyne analyzers.

**Table 4.3-2 O<sub>3</sub> Design Values at ADEQ Sites**

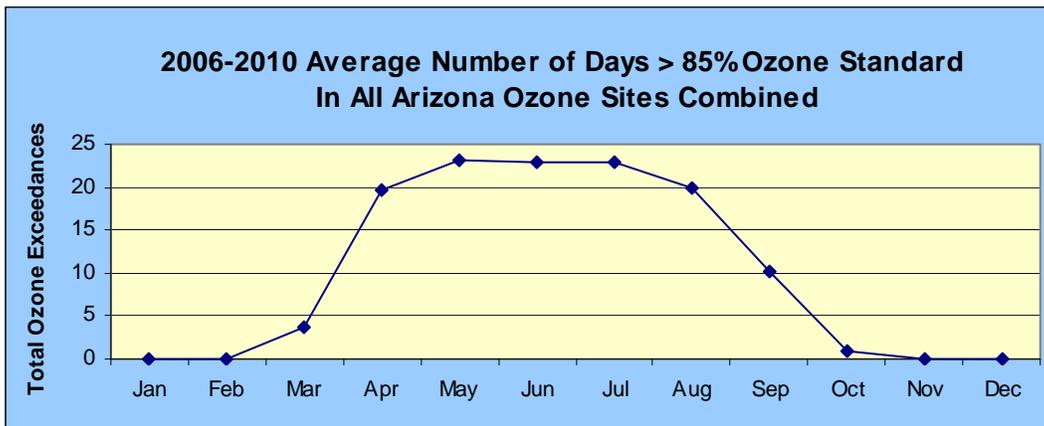
Site	Current Operating Schedule	2009-2011 Design Value (ppm)
Alamo Lake	March - October	0.070
Flagstaff Middle School	March - October	0.067
JLG Supersite	January - December	0.075
Prescott College AQD	March - October	0.066
Queen Valley	March - October	0.073
Tonto National Monument	March - October	0.072
Yuma Supersite	March - October	0.073

#### 4.3.1 O<sub>3</sub> Season

In accordance with 40 CFR Part 58, Appendix D, Paragraph 4.1(i), ADEQ was granted a modification to the January through December O<sub>3</sub> season defined in the regulation. Prior to the 2008 revision to the O<sub>3</sub>

NAAQS, the 1998 EPA guidance document entitled, “Guideline for Selecting and Modifying the Ozone Monitoring Season Based on an Eight-Hour Ozone Standard” supported a shorter O<sub>3</sub> season for Arizona (April through October) based upon data collected from 1990-1995. During the Spring of 2011, this analysis was updated to include the 2008 O<sub>3</sub> NAAQS, as well as more recent data. To get the best representation of the entire state, data from all O<sub>3</sub> sites in Arizona were used in the analysis. For the period 2006-2010, the average number of days above 85 percent of the 2008 NAAQS of 0.075 ppm continues to support the operation of seasonal monitors (see Figure 4.3-1). However, the data indicate that the O<sub>3</sub> season should be extended one month to include the month of March. In 2012 ADEQ extended the O<sub>3</sub> season by starting to monitor in March instead of April. ADEQ may do additional monitoring in the off season of November – February for its own purposes; however, those data will not be reported to the AQS database. As shown in Table 4.3-2, the current ADEQ seasonal sites are Alamo Lake, Flagstaff Middle School, Prescott College AQD, Queen Valley, Tonto National Monument, and Yuma Supersite. The JLG Supersite will continue to operate on a January to December schedule.

**Figure 4.3-1 Average Number of Days exceeding 85% of the 2008 O<sub>3</sub> NAAQS**



#### 4.4 Pb Monitoring Network Requirements

In November 2008, EPA revised the Pb NAAQS from 1.5 µg/m<sup>3</sup> to 0.15 µg/m<sup>3</sup>. New requirements for the placement of monitors were added: (1) near Pb sources (by January 1, 2010) having annual ambient air Pb emissions that are expected to exceed one ton and (2) in non-source urban areas (by January 1, 2011) with populations greater than 500,000. In December 2009, EPA proposed revisions to these monitoring requirements. In December, 2010, the EPA finalized the Pb monitoring requirements which required Pb monitoring near sources with Pb emissions greater than 0.5 tons. Monitors near these 0.5 to 1 ton sources are to be operational one year from the date of the final rule. Additionally, the final rule adjusted the non-source monitoring requirement to be limited to NCore sites with CBSA populations greater than 500,000. ADEQ has installed source-oriented Pb monitors at the Globe Highway site as well as the Miami Golf Course site, effective January, 2011. For the NCore-Pb requirement, ADEQ will use the same PM<sub>10</sub> metals speciation sample that is used for the NATTS program for the analysis of Pb in PM<sub>10</sub>. Eastern Research Group (ERG) currently analyzes these samples and has recently received EPA approval for the ICP-MS analysis method for lead. No changes in the actual monitoring or analysis method will occur for Pb data collected at JLG Supersite; however, a new parameter code and method code may be associated with the data in AQS due to the newly approved analysis method. The Pb

monitoring final rule also clarified that Pb monitoring will not be required in the Prescott area, despite Ernest A. Love Field Airport exceeding the 0.5 ton Pb emissions threshold.

**Table 4.4-1 Pb Design Values at ADEQ Sites**

Site Name	2009-2011 Design Value ( $\mu\text{g}/\text{m}^3$ )
Globe Highway <sup>1</sup>	0.27
Miami Golf Course <sup>2</sup>	0.06
JLG Supersite *	---

\* PM<sub>10</sub> Metals (low-Vol., filter-based) analysis method approved 2012

<sup>1</sup> Design Value based on one year of data, but is valid due to NAAQS violation

<sup>2</sup> Design Value invalid due to incomplete data (only one year collected)

#### 4.4.1 Pb Collocation Requirements

Table 4.4-2 summarizes ADEQ’s Pb collocation requirements. As can be seen in the table, only one collocated site is needed for the ADEQ Pb network. This site is the Globe Highway site in Hayden, AZ. As can be seen in table 4.4-1, this site contains the highest design value in the Pb network. Collocation for NCore-Pb sites are determined by the EPA, and the JLG Supersite has not been selected as a collocated site.

**Table 4.4-2 Pb FRM/FEM Collocation Details**

Method Code	# of Sites	# of Primary Monitors	# of Required Collocated Monitors	# of Active Collocated Monitors
191 (Pb-TSP ICPMS)	2	2	1	1
202 (Pb-PM <sub>10</sub> ICPMS)	1	1	0	0

#### 4.5 SO<sub>2</sub> Monitoring Network Requirements

ADEQ operates a network of three SO<sub>2</sub> monitors throughout Arizona. Authority to operate SO<sub>2</sub> monitors has also been delegated to Maricopa and Pima counties. ASARCO LLC and Freeport-McMoRan Copper & Gold Inc. also operate SO<sub>2</sub> monitoring networks in Gila County for compliance purposes to support SIP requirements. ADEQ is currently negotiating with both companies to make changes in which ADEQ may assume some of the SO<sub>2</sub> monitoring responsibilities.

**Table 4.5-1 SO<sub>2</sub> Design Values at ADEQ Sites**

Site Name	2009-2011 1-Hour Design Value (ppb)
Miami Ridgeline	111
Hayden Old Jail	259
JLG Supersite *	7

\* Based on incomplete data (2011)

The SO<sub>2</sub> monitoring requirements set forth in 40 CFR Part 58 Appendix D is based on a Population Weighted Emissions Index (PWEI) that is calculated for each CBSA. CBSAs with PWEIs greater than 5,000 require at least one SO<sub>2</sub> monitor. CBSAs with PWEIs greater than 100,000 require a minimum of two SO<sub>2</sub> monitors. The Phoenix and Tucson metropolitan areas are the only areas within the state of Arizona that require ambient monitoring of SO<sub>2</sub>. The current SO<sub>2</sub> monitors in place that are operated by Maricopa and Pima counties meet or exceed the current monitoring requirements set forth in 40 CFR Part 58 Appendix D. In an effort to more efficiently report SO<sub>2</sub> and PM<sub>10</sub> data to EPA's AQS database, ADEQ has begun negotiations with Freeport McMoRan to discuss changes in operator status. ADEQ may assume monitoring responsibilities or collocate monitors at Freeport McMoRan sites in the Miami, AZ area. ADEQ is proposing to collocate SO<sub>2</sub> monitors at Freeport McMoRan's Jones Ranch and Miami Townsite sites. Data from these monitors would be routinely reported to EPA's AQS database. In doing so, ADEQ is proposing to discontinue the Miami Ridgeline site as the Jones Ranch and Miami Townsite sites would provide sufficient coverage for SO<sub>2</sub> concentrations in the Miami area with the Jones Ranch site representing maximum concentrations and the Miami Townsite site representing general population exposure. For additional details on these changes, see Appendix H for a copy of the letter to EPA Region 9 requesting approval. ADEQ has also contacted ASARCO LLC to discuss similar changes. Until a more permanent plan is established, ADEQ will continue to operate at least one SO<sub>2</sub> monitor in the Hayden and Miami areas to support the local facility networks. Additionally, ADEQ will continue to work with these facilities to obtain quality assured data and will perform annual performance evaluations for these facilities' SO<sub>2</sub> monitors. ADEQ also operates a trace-level SO<sub>2</sub> monitor at its NCore site (JLG Supersite), as required in 40 CFR Part 58 Appendix D.

#### **4.6 NO<sub>2</sub> Monitoring Network Requirements**

ADEQ operates one NO<sub>2</sub> monitor throughout the state of Arizona. This NO<sub>2</sub> monitor is located at the JLG Supersite and is operated to fulfill a PAMS requirement. Authority to operate NO<sub>2</sub> monitors has also been delegated to Maricopa and Pima counties.

The NO<sub>2</sub> monitoring requirements set forth in 40 CFR Part 58 Appendix D are based on a combination of CBSA population and Annual Average Daily Traffic (AADT) counts. The first requirement to be considered is the CBSA population. CBSAs with populations greater than 500,000 are required to operate one near roadway monitor, while CBSAs with populations greater than 2.5 million are required to operate two near roadway monitors. Additionally, CBSAs with populations greater than 500,000 which also contain roadway segments with 250,000 or greater AADT also require two near roadway monitors. As can be seen in table 4.0-1, two CBSAs (Phoenix and Tucson Metro areas) within the state of Arizona contain populations greater than 500,000 and therefore require at least one NO<sub>2</sub> near roadway monitor. The Phoenix CBSA also exceeds the 2.5 million population requirement, therefore two near roadway monitors are needed in the Phoenix CBSA. The required near roadway monitors in Tucson and Phoenix will be operated by the local monitoring agencies in their respected areas. Recent guidance from EPA has indicated a phased approach for NO<sub>2</sub> near roadway monitor installments. The phased approach would push back the deadlines for monitor installments to January, 2014 for Maricopa County and January, 2017 for Pima County. As a result, Pima County has relaxed their planning efforts given the longer time frame. As part of the five-year network assessment submitted in 2011, ADEQ has reviewed population and AADT data and has determined that no other areas in the state require near roadway NO<sub>2</sub> monitors.

In addition to the near roadway monitoring requirements set forth in 40 CFR Part 58 Appendix D, there is also a requirement for area-wide NO<sub>2</sub> monitoring. CBSAs with populations of one million or more require one NO<sub>2</sub> monitor to measure NO<sub>2</sub> concentrations that represent neighborhood or larger spatial scales. The Phoenix metropolitan area is the only area within the state of Arizona that require ambient monitoring of NO<sub>2</sub>. The current NO<sub>2</sub> monitors in place that are operated by Maricopa and Pima counties meet or exceed the current monitoring requirements set forth in 40 CFR Part 58 Appendix D. ADEQ will continue to monitor NO<sub>2</sub> at JLG Supersite as part of the NO<sub>x</sub> measurements which are required for the PAMS program.

**Table 4.6-1 NO<sub>2</sub> Design Values at ADEQ Sites**

Site Name	2009-2011 1-Hour Design Value (ppb)
JLG Supersite *	54

\* Design Value does not meet data completeness criteria

#### 4.7 CO Monitoring Network Requirements

ADEQ operates one CO (carbon monoxide) monitor throughout Arizona. This CO monitor utilizes an instrument with sufficient sensitivity to monitor trace levels. It is located at the JLG Supersite to fulfill NCore and PAMS monitoring requirements. Authority to operate CO monitors has also been delegated to Maricopa and Pima counties. The Phoenix population exceeds the one million population requirement set forth in 40 CFR Part 58 Appendix D, therefore one CO monitor is required to be collocated with a near-road NO<sub>2</sub> monitor. The required near roadway monitor in Phoenix will be operated by Maricopa County. The most recent Census data show the Tucson MSA slipped slightly below one million so no near-road CO monitoring is required. The one CO monitor that is currently operated by ADEQ meets or exceeds the minimum monitoring requirements for the NCore and PAMS, network design criteria set forth in 40 CFR Part 58 Appendix D. Due to the low range for which the JLG CO analyzer operates, ADEQ urges some caution when interpreting data for the purpose of NAAQS compliance. While under most circumstances the data can be used to determine compliance with the CO NAAQS due to the low nature of the ambient concentrations, the operating range (0-5 ppm) is below that of the CO NAAQS (9 ppm), therefore under certain rare circumstances (i.e. concentrations > 5 ppm), determining compliance with the CO NAAQS may not be possible.

**Table 4.7-1 CO Design Values at ADEQ Sites**

Site Name	2011 CO 1-Hour Design Value (ppm)	2011 CO 8-Hour Design Value (ppm)
JLG Supersite *	2.7	2.1

\* Design Value does not meet data completeness criteria

#### 4.8 PAMS Monitoring Network Requirements

Network design and monitoring requirements for PAMS stations are provided in 40 CFR 58 Appendix D for areas classified as serious, severe, or extreme nonattainment for O<sub>3</sub>. Two sites are required for

each area, providing all chemical measurements are made. Measurements include speciated VOCs, carbonyls, NO<sub>x</sub>, trace level nitrogen oxides (NO<sub>y</sub>), CO, O<sub>3</sub>, surface meteorology, and upper air meteorology. In 2008, EPA shortened the PAMS monitoring season to June through August.

ADEQ's PAMS network consists of two ambient air monitoring sites in the Phoenix-Mesa-Scottsdale MSA and a meteorological site for the collection of upper air meteorological data and solar radiation data.

#### JLG Supersite – Type 2 PAMS Site

The JLG Supersite was designated a PAMS site in 1999. Since the required manual method of eight three-hour canisters running daily is impractical due to increased expenses for staff, shipping, and analysis, ADEQ returned in 2008 to the 2006 monitoring schedule of a 24-hour canister sample every sixth day at the JLG Supersite during PAMS season for VOCs. This will be reviewed when the final results of the PAMS re-engineering program are available which is anticipated to include recommendations for changes to monitoring and new types of instruments. ADEQ also operates carbonyl, O<sub>3</sub>, CO, NO<sub>x</sub>, and surface meteorological monitoring equipment at JLG Supersite (see Table 4.8-1). Carbonyl monitoring at JLG Supersite is not currently required for PAMS but because carbonyls are considered important for PAMS, there are no current plans to discontinue carbonyl monitoring at JLG Supersite.

**Table 4.8-1 JLG Supersite PAMS Instrumentation**

Parameter	Period of Operation	Collection Method	Frequency and Duration
VOC *	June – August	Canister Sampler	Every 6th day, 24 Hr
Carbonyl *	June – August	Multi-port Carbonyl Sampler	Every 6th day, 3 - 3hr samples (0500-0800, 0800-1100, 1100-1400)
CO	Jan – Dec	Trace CO	Hourly average
O <sub>3</sub>	Jan – Dec	O <sub>3</sub> Analyzer	Hourly average
NO <sub>x</sub>	Jan – Dec	NO <sub>x</sub> Analyzer	Hourly average
Meteorology	Jan – Dec	<ul style="list-style-type: none"> <li>• wind speed/direction</li> <li>• temperature</li> <li>• relative humidity</li> </ul>	Hourly average

\* 24-hour VOC and Carbonyl measurements are also collected year-round as part of the NATTS program

#### Queen Valley – Type 3 PAMS Site

Queen Valley was designated a PAMS site in 2001. The site is located near the southeastern edge of the photochemical modeling grid domain and is considered to be downwind of the source of maximum precursor emissions in the Phoenix metropolitan area. Pollutants collected at the site include speciated PAMS VOCs, O<sub>3</sub>, total reactive NO<sub>x</sub>, and surface meteorology measurements. ADEQ's Five-Year Network Assessment identified the Queen Valley site as not meeting PAMS monitoring requirements due to the lack of meteorological measurements. Meteorological instrumentation was added during the second quarter of 2011. Carbonyl samples are not required at Type 3 sites. Table 4.8-2 lists the instrumentation and monitoring schedule at the Queen Valley site.

**Table 4.8-2 Queen Valley PAMS Instrumentation**

Parameter	Period of Operation	Collection Method	Frequency and Duration
VOC	June – August	Multi-port sampler	Every 6 <sup>th</sup> day, 24Hr, and 3 – 3hr samples (0500-0800, 1300-1600, 1600-1900)
O <sub>3</sub>	March – October	O <sub>3</sub> Analyzer	Hourly average
NO <sub>y</sub>	June – August	NO <sub>y</sub> Analyzer	Hourly average
Meteorology	Jan – Dec	<ul style="list-style-type: none"> <li>• wind speed/direction</li> <li>• temperature</li> <li>• relative humidity</li> </ul>	Hourly average

Vehicle Emissions Laboratory – Upper Air Meteorology Site

This site is intended to be a meteorological ‘supersite’ and includes a pyranometer to measure total solar radiation, UV solar radiation, wind speed, wind direction, differential temperature (2 meters and 10 meters), and relative humidity. Barometric pressure and precipitation measurements are collected by the National Weather Service (NWS) site at nearby Sky Harbor Airport. A Radio Acoustic Sounding System (RAAS) and a wind profiler have also been collecting continuous upper air meteorological data for determination of mixing heights since 1998. The PAMS re-engineering workgroup has noted the high maintenance cost and lack of use of the RASS and wind profiler data and unofficially recommended against its continued use – particularly if usable data is available from other sources. As a result, ADEQ is considering discontinuing its use. EPA is currently exploring the possibility of using mixing height data from some of the 1,000 ceilometers recently placed in use by NOAA.

**Table 4.8-3 Vehicle Emissions Laboratory PAMS Instrumentation**

Parameter	Period of Operation	Method	Duration
Meteorology	Jan – Dec	<ul style="list-style-type: none"> <li>• Radio Acoustic Sounding System (RASS)</li> <li>• pyranometer (total solar radiation)</li> <li>• ultra-violet (UV solar)</li> <li>• wind speed/direction</li> <li>• temperature</li> <li>• relative humidity</li> </ul>	Hourly average

**4.9 NCore Monitoring Network Requirements**

EPA has identified JLG Supersite as the required NCore site for the Phoenix metropolitan area. JLG Supersite has a long history of multipollutant monitoring since its establishment in 1993. Currently, several monitoring programs are supported at this site, (SLAMS, PAMS, NATTS, and CSN) as well as meteorology. The required NCore parameters are listed in Table 4.9-1. All required NCore monitors were operational by January 1, 2011. EPA approved ADEQ's NCore monitoring plan submitted in 2009, but did not grant the waiver request to substitute NO<sub>x</sub> monitoring for NO<sub>y</sub>. The NCore-Pb requirement is being met by using the current PM<sub>10</sub> metals speciation sampler (PM<sub>10</sub> Low-Vol Partisol 2000) and associated samples. ADEQ recently received notice that the ERG analysis method for PM<sub>10</sub> metals

speciation has been approved as a Federal Equivalent Method (FEM) for the analysis of Pb. While there will be no physical changes to the instrumentation or analysis method for Pb at the NCore site, the parameter code and method code associated with Pb-PM<sub>10</sub> data in AQS may change as is appropriate.

**Table 4.9-1 JLG Supersite NCore Instrumentation**

Required Measurement	Frequency/Duration	Status
PM <sub>2.5</sub> FRM mass	24 hour average every 3rd day	Thermo Partisol is current instrument; PM <sub>2.5</sub> samples collected since 1999
PM <sub>2.5</sub> speciation - organic and elemental carbon, major ions, and trace metals	24 hour average; every 3rd day	MetOne SuperSASS with URG module is current instrument; STN samples collected since 1999
Continuous PM <sub>coarse</sub> mass	Hourly	MetOne BAM 1020 FEM pair
Continuous PM <sub>2.5</sub> mass	Hourly	MetOne BAM 1020 FEM pair
O <sub>3</sub>	Hourly	API Teledyne 400E
CO	Hourly	Ecotech EC 9830
SO <sub>2</sub>	Hourly	Ecotech EC 9850
NO/NO <sub>y</sub>	Hourly	Ecotech EC 9843
Surface meteorology	Hourly	RM Young anemometer, Rotronics temperature/relative humidity probe currently in operation
Pb	24 hour average; every 6th day	Currently Pb measurements are from the NATTS PM <sub>10</sub> metals sampler. EPA recently approved ERG's ICP-MS analysis method as an FEM.

#### 4.10 SIP Monitoring Network Requirements

ADEQ is responsible for preparation and submittal of SIPs to EPA for the non-attainment and maintenance areas in Arizona. ADEQ is also responsible for conducting ambient air monitoring for these areas with the exception of the delegated agreements with Maricopa, Pima, and Pinal counties and tribal lands. Permitted sources are also responsible for monitoring air quality, if it is included in their air quality permit. Some monitoring sites are specifically named in some SIPs; other monitoring sites are not specifically named, but are representative of the air quality in that SIP area. Table 4.10-1 lists the ADEQ and source operated monitors used to determine SIP compliance.

**Table 4.10-1 SIP Network Monitoring Requirements**

Note: *Sites in italics are specifically required in SIP*; others meet the general SIP requirement that representative monitoring be conducted (no specific monitoring sites named in SIP).

Area and County	Pollutant	Classification	ADEQ SIP Sites
Phoenix, Maricopa	CO	Maintenance/Attainment	<i>JLG Supersite</i>
Phoenix, Maricopa	O <sub>3</sub> 1-hr	Maintenance/Attainment	<i>JLG Supersite, Tonto National Monument</i>
Phoenix-Apache Junction, Maricopa and Pinal	O <sub>3</sub> 8-hr	"Basic" Nonattainment	Alamo Lake, <i>JLG Supersite</i> , Queen Valley, <i>Tonto National Monument</i>
Ajo, Pima	PM <sub>10</sub>	Moderate Nonattainment	<i>Ajo</i>
Bullhead City, Mohave	PM <sub>10</sub>	Maintenance/Attainment	<i>Bullhead City (Post Office)</i>

Area and County	Pollutant	Classification	ADEQ SIP Sites
Douglas-Paul Spur, Cochise	PM <sub>10</sub>	Moderate Nonattainment	Douglas Red Cross , <i>Paul Spur Chemical Lime Plant</i>
Hayden, Gila and Pinal	PM <sub>10</sub>	Moderate Nonattainment	<i>Hayden Old Jail</i>
Miami, Gila	PM <sub>10</sub>	Moderate Nonattainment	<i>Freeport McMoRan sites: Golf Course &amp; Miami Ridgeline</i>
Nogales, Santa Cruz	PM <sub>10</sub>	Moderate Nonattainment	<i>Nogales Post Office</i>
Payson, Gila	PM <sub>10</sub>	Maintenance/Attainment	<i>Payson Well Site</i>
Phoenix, Maricopa, and Pinal (Apache Junction portion) Phoenix (Salt River Area)	PM <sub>10</sub>	Serious Nonattainment	<i>JLG Supersite</i>
Rillito, Pima	PM <sub>10</sub>	Moderate Nonattainment	<i>Rillito</i>
Yuma, Yuma	PM <sub>10</sub>	Moderate Nonattainment	Yuma Supersite
Nogales, Santa Cruz	PM <sub>2.5</sub>	Nonattainment	Nogales Post Office
Ajo, Pima	SO <sub>2</sub>	Maintenance/Attainment	No network or commitment
Douglas, Cochise	SO <sub>2</sub>	Maintenance/Attainment	No network or commitment
Hayden, Gila and Pinal	SO <sub>2</sub>	Nonattainment – Primary	<i>ADEQ (SO<sub>2</sub>, MET): Hayden Old Jail ASARCO (5 SO<sub>2</sub>, 3 MET [no met at Jail or Garfield]): Globe Hwy, Garfield Ave., Montgomery Ranch, Hayden Old Jail, Hayden Junction</i>
Miami, Gila	SO <sub>2</sub>	Maintenance/Attainment	<i>ADEQ: Miami Ridgeline Freeport McMoRan (SO<sub>2</sub>, MET) Jones Ranch, Miami Townsite</i>
Morenci, Greenlee	SO <sub>2</sub>	Maintenance/Attainment	No network or commitment
San Manuel, Pima and Pinal	SO <sub>2</sub>	Maintenance/Attainment	No network or commitment
Regional Haze, 12 Class I areas	Visibility Impairing pollutants (VOC, NO <sub>x</sub> , SO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , PM <sub>2.5</sub> species)	Statewide – IMPROVE monitors	ADEQ Protocol sites: Douglas Red Cross, Organ Pipe Natl Monument, JLG Supersite, Queen Valley, Saguaro West Natl Monument, Meadview  NPS / USFS sites: Chiricahua Entrance Station, Greer Water Treatment Plant, Grand Canyon - Indian Gardens, Grand Canyon - Hance Camp, Ike's Backbone, Meadview, Petrified Forest National Park, Pleasant Valley Ranger Station, Saguaro National Park-East, Sycamore Canyon, Tonto National Monument

#### 4.11 Source Compliance Monitoring Network Requirements

Historically, ADEQ has required several of the major point sources in the state to conduct ambient monitoring for selected pollutants in and around specific facilities. Some requirements are for prevention of significant deterioration (PSD) monitoring prior to operation of the facility. Other monitoring requirements are for the duration of the permit. ADEQ activities have been limited to regular performance audits of some equipment at these sites and review of ambient data submitted according to permit requirements. Recently, ADEQ has begun to submit a portion of these data to the EPA AQS database to support SIP compliance. Sources are required to review their data and submit quality assurance documents to ADEQ with the data. Table 4.11-1 lists the monitors operated by ADEQ permitted sources. ADEQ staff are currently working with ASARCO and Freeport McMoRan staff to

acquire and report SO<sub>2</sub> data from Miami and Hayden to the EPA AQS database. In an effort to more efficiently report SO<sub>2</sub> and PM<sub>10</sub> data from these areas to EPA's AQS database, ADEQ has begun negotiations with Freeport McMoRan to discuss changes in operator status. ADEQ may assume monitoring responsibilities or collocate monitors at existing Freeport McMoRan sites in the Miami, AZ area. ADEQ has also contacted ASARCO LLC to discuss similar changes. ADEQ will continue to perform annual performance evaluations for these facilities' SO<sub>2</sub> monitors. Except for potential changes to the Miami and Hayden area networks, the only other change in the source compliance monitoring network includes the discontinuation of PM<sub>10</sub> monitors in Rillito. ADEQ has operated a continuous PM<sub>10</sub> TEOM in Rillito for several years now, therefore, PM<sub>10</sub> monitoring conducted by the source was determined to be redundant and unnecessary.

**Table 4.11-1 Source Compliance Monitoring Network**

Site Name	City	Pollutant(s)	AQS Submittal
Globe Highway	Winkelman	SO <sub>2</sub>	No
ASARCO – Hayden – Garfield Ave.	Hayden	SO <sub>2</sub>	No
ASARCO – Montgomery Ranch	Hayden	SO <sub>2</sub>	No
ASARCO – Hayden Junction	Hayden Junction	SO <sub>2</sub>	No
Hayden Old Jail	Hayden	SO <sub>2</sub>	No <sup>1</sup>
Chemical Lime Plant	Nelson	Meteorology	No
Drake Cement	Sycamore Canyon	PM <sub>10</sub> , PM <sub>2.5</sub> mass and ammonium speciation, Meteorology	No
Miami Ridgeline	Miami	PM <sub>10</sub> mass and metals speciation	Yes (PM <sub>10</sub> mass only)
Miami Golf Course	Miami	PM <sub>10</sub> mass and metals speciation, collocated	Yes (PM <sub>10</sub> mass only)
FMMI – Miami – Jones Ranch	Miami	SO <sub>2</sub>	No <sup>2</sup>
FMMI – Miami – Townsite	Miami	SO <sub>2</sub>	No <sup>2</sup>
PCC – Clarkdale NW	Clarkdale	PM <sub>10</sub> mass and metals speciation, Meteorology	No
PCC – Clarkdale SE	Clarkdale	PM <sub>10</sub> mass and metals speciation, Meteorology	No
Carlota Mine – Sanctuary	Globe	PM <sub>10</sub> , H <sub>2</sub> SO <sub>4</sub> , Meteorology	No

Site Name	City	Pollutant(s)	AQS Submittal
TEP – Springerville – Coyote Hills	Springerville	NO <sub>2</sub> , PM <sub>10</sub> , SO <sub>2</sub> , Meteorology	No
TEP – Springerville – Coal Yard	Springerville	PM <sub>10</sub>	No

<sup>1</sup> ADEQ also operates an SO<sub>2</sub> monitor at the Hayden Old Jail site. The ADEQ data are submitted to AQS while the facility data are not.

<sup>2</sup> ADEQ has not yet been able to report these data to the AQS database.

#### 4.12 Class I Visibility Network

Visibility monitoring networks track impairment in specified national parks and wilderness areas. These parks and wilderness areas are called Class I Areas and were designated based on an evaluation required by Congress in the 1977 federal CAA Amendments. The evaluation which was performed by the USFS and NPS reviewed the wilderness areas of parks and national forests which were designated as wilderness before 1977, were more than 6,000 acres in size, and have visual air quality as an important resource for visitors. Of the 156 Class I Areas designated across the nation, 12 are located in Arizona.

For the Class I Area designations, EPA initiated a nationally-operated monitoring network in 1987 called the Interagency Monitoring of Protected Visual Environments (IMPROVE) program. The purpose of the network is to characterize broad regional trends and visibility conditions using monitoring data collected in or near Class I Areas across the United States. Originally, the national IMPROVE network was made up of approximately 30 sites at Class I areas. During 1999-2000 the number of sites increased to approximately 110. ADEQ, Pima County, and federal land managers at Arizona's Class I areas cooperatively operate the visibility monitoring network in Arizona. The current network is described in Table 4.12-1. In addition to the Class I IMPROVE monitors listed in Table 4.12-1, ADEQ also operates one IMPROVE monitor at the Douglas Red Cross site, and collocated monitors at the JLG Supersite. The JLG Supersite serves as an urban IMPROVE monitor and has been used to provide comparative analysis with data from the CSN network. The Douglas Red Cross site may serve multiple objectives and its data will be evaluated in the upcoming year to determine if it continues to meet its designated purpose(s) or if it could be better utilized at another location. See the IMPROVE map in Appendix B for a spatial representation of the IMPROVE monitoring network and Class I areas within the state of Arizona.

ADEQ's 1996 monitoring plan for the Arizona Class I areas proposed adding optical (nephelometer) and wind-speed and direction meteorological monitoring equipment to existing IMPROVE sites to supplement data collected by the IMPROVE aerosol monitors. Those continuous measurements were intended to supplement the IMPROVE measurements and better characterize the air quality in these areas. Part of the motivation for installing integrating nephelometers at IMPROVE sites was a desire to use short term (five minutes) visibility estimates to model the visual experience of a visitor to a Class I area. A second motivation for installing nephelometers at IMPROVE sites was to provide input to mathematical algorithms that create values that can be compared with the IMPROVE measurements to test the performance of the IMPROVE algorithm. Both the original and the revised IMPROVE

algorithms tend to slightly over-estimate the lowest extinction values typical of the Arizona IMPROVE sites.

**Table 4.12-1 2011 Arizona Class I Visibility Monitoring Network**

<b>Geographic Area Represented</b>	<b>Monitoring Location</b>
Background	Meadview, Organ Pipe National Monument
Chiricahua National Monument, Chiricahua Wilderness Area and Galiuro USFS Wilderness	Chiricahua Entrance Station
Grand Canyon National Park	Hance Camp and Indian Gardens
Mazatzal and Pine Mountain USFS Wilderness	Ike’s Backbone
Mount Baldy	Greer Water Treatment Plant
Petrified Forest National Park	Petrified Forest
Saguaro National Park	East Unit and West Unit
Sierra Ancha USFS Wilderness	Pleasant Valley Ranger Station
Superstition USFS Wilderness	Tonto National Monument, Queen Valley
Sycamore Canyon USFS Wilderness	Sycamore Canyon (Camp Raymond)

Due to budget constraints, ADEQ shut down the Class I nephelometer network in 2010. Over a decade of data were collected at several of these nephelometer sites. In early 2011, a draft summary report was written which summarizes the nephelometer data that were collected since 1997. The report provides comparisons of calculated visibility impairment between the IMPROVE aerosol monitors and collocated nephelometers. Summaries and trends in visibility data are also presented within the report, as well as meteorological data summaries in the form of wind roses. This report is meant to serve as a final data summary for the Class I Nephelometer network. Information from this report may be utilized in the future if further modifications are needed to the Arizona Class I visibility network.

**4.13 Urban Haze Monitoring Network**

Historically, ADEQ monitored the Phoenix and Tucson metropolitan areas with a network of instruments to characterize and quantify the extent of urban haze. There are no established federal or state standards for acceptable levels of urban haze. ADEQ began studying the nature and causes of urban hazes by conducting studies during the winter of 1989-90 in Phoenix and during the winter of 1992-93 in Tucson. These studies recommended long-term, year-round monitoring of visibility. In 1993, ADEQ began deploying visibility monitoring equipment in Phoenix and Tucson. These visibility monitoring data are needed to provide policymakers and the public with information, track short and long-term trends, assess source contributions to urban haze, and better evaluate the effectiveness of air pollution control strategies. Equipment currently used to evaluate urban visibility includes transmissometers, nephelometers, particulate monitors, and digital camera systems.

The Phoenix urban haze network consists of a transmissometer for measuring light extinction along a fixed path length of four and a half kilometers, three nephelometers for measuring light scattering, five digital camera systems to record visual characteristics of the urban area, and particulate filters for quantifying and characterizing particulate matter.

Due to budget constraints, the Tucson urban haze network was shut down in September, 2010. Approximately a decade of urban haze data were collected in the Tucson area. In early 2011, a draft summary report was written which summarizes the nephelometer and transmissometer data that were collected since 1997. The report provides summaries and trends in urban visibility data, as well as meteorological data summaries in the form of wind roses. This report is meant to serve as a final data summary for the Tucson Urban Haze network. Information from this report may be utilized in the future if further modifications are needed to the Urban Haze Network.

The current Phoenix urban haze sites (and their status) are described in Table 4.13-1. ADEQ continues to evaluate the Urban Haze program and is currently exploring the possibility of reallocation of the Phoenix visibility camera network to provide resources to additional areas around the state.

**Table 4.13-1 Urban Haze Monitoring Network**

<b>Site Name</b>	<b>Parameter(s) Measured</b>
<b>Phoenix Network - Operational</b>	
ADEQ Building	High Resolution Digital Camera
Banner Mesa Medical Center	High Resolution Digital Camera
Dysart	Light Scattering (Bscat) Nephelometer
Estrella	Light Scattering (Bscat) Nephelometer
Estrella Mountain Community College	2 High Resolution Digital Cameras
JLG Supersite	IMPROVE
North Mountain Summit	High Resolution Digital Cameras
Phoenix Transmissometer (Phoenix Baptist Hospital to Holiday Inn Hotel)	Transmissometer (Bext)
Vehicle Emissions Laboratory	Light Scattering (Bscat) Nephelometer

#### **4.14 Meteorology Monitoring Network**

ADEQ operates meteorological equipment at selected sites throughout its network (Table 4.14-1). Some sites were originally established because other meteorology networks (NWS, AZMet, etc.) were not located near ADEQ's ambient air quality sites. As recommended in ADEQ's Five-Year Network Assessment, ADEQ has begun to expand the meteorology monitoring network and standardize the meteorological measurements so that all sites collect measurements of wind speed, wind direction, temperature, and relative humidity. Currently, Ajo is the only meteorological site that does not have the full suite of meteorological instruments. A temperature / RH probe may be added to this site within the next year to compliment the current measurements of wind speed and wind direction.

Except for the items mentioned above ADEQ does not have any specific plans to make changes to the meteorological network, but may add additional meteorological equipment at existing SLAMS sites as resources and funding permit. At this time, ADEQ plans to only submit meteorological data that are required by 40 CFR Part 58.16 to EPA's AQS database. If future resources allow additional meteorological data submittals to the AQS database, ADEQ may do so on a voluntary basis. A spatial representation of ADEQ's meteorological monitoring network can be found in Appendix B.

**Table 4.14-1 Meteorology Monitoring Network**

Site	Temp.	Temp. Lapse Rate System	Relative Humidity	Wind	Total Horizontal Solar Radiation	Ultraviolet Solar Radiation	Wind Profiler	Report to AQS	Comments
Ajo				X				No	
Globe Highway	X		X	X				No	
Hayden Old Jail	X		X	X				No	
JLG Supersite	X		X	X				Yes	For NCore / PAMS support
Miami Golf Course	X		X	X				No	
Nogales Post Office	X		X	X				No	
Paul Spur Chemical Lime Plant	X		X	X				No	
Payson Well Site	X		X	X				No	
Queen Valley	X		X	X				Yes	For PAMS support
Rillito	X		X	X				No	
Vehicle Emissions Laboratory	X	X	X	X	X	X	X	Solar only	For PAMS support
Yuma Supersite	X		X	X				No	

## 5.0 MONITORING PLAN QUALITY ASSURANCE

EPA specifies the quality assurance requirements for SLAMS, SPMs, and PSD air monitoring programs in 40 CFR 58 Appendix A. Data quality objectives, measurement quality objective and indicators, quality control (QC) checks for the monitors, calculations for data quality assessments, and data reporting requirements are part of the Air Assessment Section's (AAS) quality management system.

### 5.1 The Quality System

All environmental data operations (EDOs) contain some level of uncertainty, or error, associated with them. The total measure of uncertainty is the sum of measurement error, which occurs in the data collection process, and population uncertainty, which relates to the representativeness of samples. ADEQ follows EPA's quality system approach which uses data quality objectives (DQOs) which are developed prior to sampling in a program's or project's planning phase. DQOs specify the amount of tolerable error that is not to be exceeded in order to make decisions using the air assessment data collected for each program's or project's specific purpose. To help meet DQOs, measurement quality objectives (MQOs), or performance constraints applied to air monitoring instruments, are used to keep measurement uncertainty within acceptable limits. Population uncertainty is controlled by proper site selection.

ADEQ serves as the Primary Quality Assurance Organization (PQAO) for the air monitoring stations it owns and operates. Being a PQAO streamlines Quality Assurance (QA) efforts by allowing meaningful measurement assessments to take place in a shorter period of time, by allowing expensive assessments such as collocated precision sampling and EPA-required performance evaluation (PE) audits such as the Performance Evaluation Program (PEP) and the National Performance Audit Program (NPAP) to take place at less sites and for results to be aggregated at higher levels that are representative of additional ADEQ sites.

As a PQAO, ADEQ uses precision and bias data from air monitoring instruments to assess how well we are achieving our established DQOs. Precision is defined as the measure of mutual agreement among individual measurements of the same property usually under prescribed similar conditions, and it is the random component of error. Precision data are generated from collocated sites and QC checks performed by the Air Monitoring Unit (AMU). Bias is the systematic or persistent distortion of a measurement process which causes error in one direction. It is determined by estimating the positive and negative deviation from the true value as a percentage of the true value. Bias data are generated from EPA and in-house PE audits.

The measurement uncertainty among all ADEQ stations monitoring for the same pollutant is expected to be reasonably homogeneous, as a result of common factors existing between those stations. Common factors typically include:

- stations being operated by a common team of field operators and according to a common set of field procedures (standard operating procedures (SOP)),
- common calibration facilities and standards,
- use of a common quality assurance program/project plan (QAPP),
- oversight by a common quality assurance organization, and

- support by a common management, laboratory, or headquarters.

### **5.1.1 ADEQ Quality Assurance Staff**

The QA Team is housed in the Data Management & Quality Assurance (DM&QA) Unit and is currently composed of two full-time employees specifically dedicated to QA/QC activities. The QA/QC Lead is a member of ADEQ's agency level QA team which is chaired by the agency's QA/QC and Laboratory Services Manager.

The QA Team provides oversight and guidance on air monitoring activities to help ensure EPA's QA requirements are met. The QA Team primarily interacts with staff from the AMU and the Air Filter Laboratory (AFL) both of which are within the AAS.

The QA Team has numerous responsibilities that include, but are not necessarily limited to:

- Coordinating the preparation of quality documents such as Quality Assurance Program Plans (QAPrP) which are required by EPA Region 9 and/or Quality Assurance Project Plans (QAPjP) and SOPs as required by EPA OAQPS for operating air monitoring equipment, sample handling, and sample processing,
- Conducting Technical Systems Audits (TSAs) of ADEQ air monitoring programs and laboratory services,
- Monitoring third-party laboratory performance on TSAs conducted by EPA,
- Conducting PE audits on ADEQ, source, and Pinal County Air Quality Control District (PCAQCD) monitors, and
- Reviewing documents such as chain-of-custody forms, data forms, and instrument performance forms that relate to DQOs.

Detailed information on the QA Team's activities is documented via an Annual Audit Report.

### **5.1.2 ADEQ Quality Documents**

ADEQ has an agency-level Quality Management Plan (QMP) that is managed by the QA/QC Manager who reports to the General Services Section in the Administrative Services Division. In 2010, the QA/QC Laboratory Services Manager submitted an updated QMP to EPA Region 9. This version was approved by the Region 9 Quality Assurance Administrator in November 2010. The QMP describes the quality management processes ADEQ uses to maintain a quality management system that supports programs involving environmental data or technology. The QMP is an "Umbrella" document which details in broad terms the strategies used to carry out QA/QC in environmental data collection activities.

Per EPA Region 9 guidance, AAS submitted a draft QAPrP to EPA Region 9 in November 2001, which was not approved. This document provided a broad overview of all air monitoring programs AAS operates. This document is being replaced by individual QAPrPs which provide more detail for each major air monitoring program. QAPjPs are developed for environmental data operations of limited scope and duration, such as special studies, which have known beginning and anticipated end dates. These projects may involve single or multi-pollutant monitoring, and the QAPjPs may refer to the

appropriate QAPrP for the pollutant to reduce duplication of effort. In practice, a QAPrP and a QAPjP are commonly referred to as a Quality Assurance Program/Project Plan (QAPP).

In 2010, the QA/QC Lead along with staff from AMU began revising the *National Air Toxics Trends Stations, Air Toxics Monitoring Program, & Photochemical Assessment Monitoring Stations QAPP* which was approved by EPA Region 9 in February 2008. Completion of this QAPP was delayed due to a re-evaluation of priorities and the QAPP schedule was revised to focus first on criteria pollutant-related QAPPs. In 2010, the QA Team began coordinating the development of a new QAPP for the new Pb monitoring program. This QAPP was submitted to EPA Region 9 as an Interim Final and was approved as such in October, 2011. The QA Team will finalize the Pb QAPP once sufficient information is available regarding the recently approved ERG analysis method. The team's goal is to expedite the completion of the Gas, PM, and Pb QAPPs as soon as practicable, with a general goal of completing or updating one QAPP per year in addition to accomplishing other QA tasks.

The instruments used in the NCore program will be addressed in several program specific QAPPs that include, but may not be limited to: the PM<sub>2.5</sub> and PM<sub>10</sub>, Gaseous Pollutants, and Meteorological QAPPs. The QA Auditor will manage PE audits on these instruments.

AAS follows the EPA's QAPP for the PM<sub>2.5</sub> STN monitoring program. This QAPP is undergoing update by the EPA OAQPS. Two samplers are used for collecting filter samples; the MetOne SuperSASS and the URG 3000. The QA Auditor conducts PE audits on the SuperSASS and URG 3000 four times per year (quarterly) per instrument.

SOPs for ambient air quality monitors are included in QAPPs as well as at monitoring sites for technicians and operators. AAS SOPs are being revised to follow EPA's format provided in the *Guidance for Preparing Standard Operating Procedures (SOPs) EPA QA/G-6*. The DM&QA Unit Manager, QA/QC Lead and the Document Control Specialist have been working on two new SOPs regarding the SOP development and document control processes. Both documents are near completion. The goal is to provide more guidance to staff creating or editing SOPs and to establish a new document control plan for AAS documents. In addition, DM&QA is developing a centralized storage area for the electronic versions of QAPPs and SOPs to ensure they are easily assessable for all. This change is expected to improve the usability of each SOP while streamlining the writing and review efforts.

## **5.2 Measurement Quality Checks – Precision and Bias Measurements**

AMU QC checks and QA PE audits generate data used to assess the quality of the ambient air quality data collected by AAS. The QC checks are used to assess precision, or imprecision actually, introduced into air quality data by the monitoring system. The PE audits generate data used to assess the amount of bias introduced into air quality data by the monitor. For particulate matter monitors, collocated sampling generates precision data as well. The information gleaned from precision and bias data is important for data certification and user purposes. This QA information is provided via the AMP 255 report which is generated by the EPA's AQS database. The AMP 255 report is included in Appendix F of this plan to demonstrate QA completeness requirements as required in 40 CFR Part 58.10.

The precision and bias data are reviewed for QA purposes by AMU and DM&QA staff to determine the quality of the ambient air data collected. Following reviews, the data are uploaded to the AQS database per 40 CFR 58 requirements for criteria pollutants.

### **5.2.1 Particulate Monitors – PM<sub>10</sub>**

ADEQ's current network operates both filter-based and continuous monitors for measuring PM<sub>10</sub>. Currently, Partisol samplers are used for filter-based measurement and both TEOMs and BAMs are used for continuous measurements. Flow rate verifications are performed once every four weeks and instrument calibrations are performed at minimum once per year or more frequently if needed by AMU staff. The QA Auditor performs PE audits on these samplers once every six months.

Section 3.3.1 of 40 CFR Part 58 Appendix A indicates that 15 percent of the filter-based PM<sub>10</sub> sites in a network must be collocated. The collocated monitors must be within four meters of each other and at least one meter apart for flow rates less than 200 liters/min. ADEQ has six filter-based PM<sub>10</sub> sites and according to the rule one collocated site is required. ADEQ operates collocated filter-based samplers at Payson Well Site to meet this collocation requirement. All concentrations from the collocated samplers are reported to the AQS with parameter occurrence code (POC) 2. Collocated samples are collected every sixth day for precision measurements. Historically, ADEQ has operated two collocated sites, but with the change from filter-based measurements to continuous at Paul Spur Chemical Lime Plant, the need for collocation at Paul Spur was eliminated.

### **5.2.2 Particulate Monitors – PM<sub>2.5</sub>**

ADEQ's current network operates both filter-based and continuous monitors for measuring PM<sub>2.5</sub>. Currently, Partisol samplers are used for filter-based measurements and TEOMs, BAMs and a few nephelometers are used for continuous measurements. Flow rate verifications are performed every four weeks and calibrations are performed annually or more frequently if needed by AMU. The QA Auditor performs PE audits on these monitors once every six months.

For the PM<sub>2.5</sub> network, each filter-based sampling method must include collocated sampling at 15 percent of the monitoring sites operated by the reporting agency. If the area has less than four monitoring sites at least one must have a precision measurement. ADEQ currently operates six PM<sub>2.5</sub> sites which results in one collocated site being required. This requirement is met with the collocation of Partisols at the Nogales Post Office site. Previously, collocated PM<sub>2.5</sub> sampling also occurred at the JLG Supersite; however, with the replacement of the Partisol 2025 instruments with a Partisol 2000 instrument, collocation will no longer be required at this site. Section 3.2.5.6 of 40 CFR Part 58 Appendix A requires that the collocated monitors must be within four meters of each other and at least one meter apart for flow rates less than 200 liters/min. Collocated samples are collected every sixth day to ensure an adequate number of precision measurements. All concentrations from the collocated monitors are reported as POC 2. PEP audits are conducted on PM<sub>2.5</sub> filter-based samplers by the EPA. The PEP audit results are also used for measuring bias and are reported to AQS by the EPA. The ADEQ network has more than five filter-based sites, which requires eight PEP audits distributed evenly over four quarters. According to this schedule, all samplers will receive a PEP audit within a six year period.

ADEQ operates two air samplers, the SuperSASS and the URG 3000, for the PM<sub>2.5</sub> STN as part of the CSN. Speciation filter samples are collected every third day. There is no collocation requirement for these samplers, but data generated from these samplers complement the data generated from the collocated IMPROVE samplers at JLG Supersite. Flow rate verifications are performed every four weeks and calibrations are performed annually or more frequently if needed. The QA Auditor audits each sampler quarterly. Beginning with 2010, all precision and bias measurements for the SuperSASS and URG are reported to the AQS by the Research Triangle Institute.

### **5.2.3 Gas Monitors – SO<sub>2</sub>, O<sub>3</sub>, CO, NO<sub>2</sub>**

One-point precision checks along with zero and span checks are conducted biweekly and multipoint verifications/calibrations are performed quarterly by AMU for all gas monitors. Multi-point PE audits are performed annually by QA. Both measurements are reported to the AQS. NPAP audits are conducted by EPA annually for bias measurements. NPAP results are reported to AQS by the EPA. Beginning in July 2010, the frequency of these audits increased and are now conducted on a semi-annual basis.

All shelters for the gas monitors contain temperature probes. The shelter temperature is checked daily via the data collection system (DCS) to verify proper operating conditions for the monitors. Shelter temperatures are required to be between 20° and 30° C. Shelter temperature probes are audited once every six months by QA.

### **5.2.4 Air Toxics Monitors**

ADEQ's JLG Supersite in Phoenix is a designated air monitoring station for the NATTS program. AMU conducts verifications and calibrations on the samplers used to collect PM<sub>10</sub> metals, Polycyclic Aromatic hydrocarbons (PAHs), and hexavalent chrome. Calibrations occur once every six months and verifications occur on a monthly or quarterly basis. QA conducts PE audits on the samplers once every six months. The VOC sampler is currently calibrated annually by ATEC and certified annually by ERG. The carbonyl sampler is currently calibrated annually by ATEC and certified annually by either ATEC or ERG.

ADEQ monitors VOCs for the Urban Air Toxics monitoring program at Maricopa County's South Phoenix site.

The QA auditor does not audit the carbonyl or VOC air toxics samplers which are returned to the manufacturer annually for certification. Audits are conducted on the Xonteck sampler which is used for collecting hexavalent chrome samples and the PUF which is used for collecting polycyclic aromatic hydrocarbon samples.

### **5.2.5 Meteorological Equipment**

Meteorological equipment is audited by the QA Team annually. The meteorological equipment at the designated NCore site will be audited once every six months.

### **5.3 Calculations and Reporting**

ADEQ submits the required AQS precision and bias report (AMP 255) to Region 9 in the annual Certification Letter per certification guidelines and CFR requirements. As stated above, all collocated particulate matter (PM) measurements are submitted quarterly to AQS as POC 2. AQS then calculates the precision statistics. The PM flow verification data and gaseous biweekly precision check data are submitted quarterly as precision records. Audit data for both PM monitors and gas monitors are also submitted quarterly.

### **5.4 ADEQ AQD Audit Responsibilities**

The QA Team conducts PE audits of ADEQ monitors, PCAQCD monitors that are included in the interagency agreement regarding PQAOs, and some source monitors.

#### **5.4.1 Internal Technical System Audits**

In 2010, the QA Team provided support and assistance to AMU in addressing the findings and recommendations from the Southern Regional Office (SRO) and Northern Regional Office (NRO) staff and operator TSAs. Corrective actions for a couple of complex findings are still in progress.

To date, the QA Auditor conducts audits on 12 IMPROVE samplers at 11 sites operating throughout the state annually. These audits are limited to evaluating site conditions and instrument performance with occasional operator interaction. Seven samplers are “protocol” samplers meaning they are owned by ADEQ. The other samplers are owned and operated by the National Park Service or the United States Forestry Service. Currently, ADEQ does not receive funds for the audits performed on IMPROVE samplers. This schedule was reviewed in 2011 and there have been no changes to the audit services provided for the IMPROVE program at this time.

In late 2009, the QA/QC Lead initiated the startup of an Air Toxics Team whose members include technicians from AMU, the QA Auditor, and the data management lead. The purpose of this team is to update the NATTS / ATMP / PAMS QAPP and instrument SOPs. The team meets on a regular basis to address issues related to air toxics sampling.

In mid-2010, the QA/QC Lead initiated the startup of a Pb Monitoring Team whose members include staff from Special Projects, AMU, the AFL, DM&QA as well as the manager of AAS. The purpose of the team was to ensure all pertinent staff were able to work together to develop program-related SOPs and the program QAPP.

In late 2011, the QA/QC Lead initiated the started up of a Gaseous Pollutant monitoring team which includes staff from DM&QA and AMU. The team is currently working on the Gaseous Pollutant QAPP and updating SOPs for gas analyzers.

#### **5.4.2 ADEQ Rankings in EPA Program Reports**

In early 2009, the QA Team reviewed the report of EPA's PEP audit program. DM&QA staff began investigating what changes may have occurred within the PM<sub>2.5</sub> network to cause a shift in program performance over the last nine years. Based on EPA's Three-Year Quality Assurance Reports for the SLAMS PM<sub>2.5</sub> Ambient Air Monitoring Program covering years 1999 through 2007, ADEQ's PM<sub>2.5</sub> network fell from a high rating to a low rating for bias results. While the information from the report is evaluated with caution due to the relatively low sample size used to summarize the results for Arizona, four areas are under review to identify and eliminate possible source(s) of error occurring in the network: the sampler and impactor combination, the AFL gravimetric weighing process, operator training, and the PEP audit and data assessment process. To date, AFL has participated in three round-robins in the Gravimetric Inter-Laboratory Comparison Study conducted by the EPA's National Air and Radiation Environmental Laboratory (NAREL) and scored well on each. AMU is currently working on updating their training procedures for those responsible for operating filter-based PM<sub>10</sub> and PM<sub>2.5</sub> instrumentation. Evaluation on the network will continue in an effort to reduce any bias that may present. ADEQ looks forward to reviewing the comprehensive PEP QA report that EPA is working on which summarizes data over a much larger time period.

#### **5.4.3 Technical Assistance and QA Handbook Document Development**

In 2010, the process of verifying flow standards used by AMU and QA underwent review. This review was initiated by the QA/QC Lead's involvement as a reviewer on a new flow standard TAD by OAQPS. Currently, most AMU and QA flow standards are certified, or verified, annually. The calibrators used by QA for criteria pollutant gases and the O<sub>3</sub> standard are checked twice per year. All gas and flow rate standards used by AMU and the QA Team are traceable to the National Institute of Standards and Technology (NIST) flow standard. The flow standard TAD draft has not been released for comment by EPA OAQPS at this time.

Throughout 2011, ADEQ DM&QA and AMU staff were actively involved in updating Volume II of EPA's Quality Assurance Handbook for Air Pollution Measurement Systems. ADEQ staff participated in bi-monthly conference calls with EPA's OAQPS staff, as well as EPA regional staff and other state and local monitoring staff. ADEQ continues to work with EPA and other state and local agency staff as the document is finalized in 2012. While ADEQ is currently working to establish program specific QAPPs for all air quality monitoring networks, the EPA QA Handbook serves as consistent guidance for AMU and DM&QA staff.

#### **5.5 EPA Audit Responsibilities**

EPA Headquarters and Region 9 each have authority to audit ADEQ's ambient air monitoring program.

##### **5.5.1 PEP and NPAP Audits**

In 2012, ADEQ will continue to participate in the EPA NPAP and the PM<sub>2.5</sub> and Pb PEP audits.

### **5.5.2 Technical System Audits**

In April 2012 EPA Region 9 conducted a TSA of ADEQ's air monitoring program. Findings and recommendations from the TSA will be reviewed by AAS staff and a Corrective Action Plan will be submitted to EPA Region 9 following the review. ADEQ will work with EPA Region 9 on the findings from the 2012 TSA. EPA Region 9 is required to conduct TSAs on the ADEQ monitoring program every three years.

In April 2010, ADEQ underwent a TSA of the NATTS program. The TSA was conducted by RTI, a contractor for EPA. A few outstanding findings and recommendations are being addressed.

## Appendix A – Definitions and Abbreviations

AAAD	Air Assessment Ambient Database
AAS	Air Assessment Section
AADT	Annual Average Daily Traffic
ADEQ	Arizona Department of Environmental Quality
AFL	Air Filter Lab
AMU	Air Monitoring Unit
Auto GC/MS	Automated Gas Chromatograph Mass Spectrometer
AQS	Air Quality System (EPA database)
BAM	Beta Attenuation Monitor
Bext	Total Light Extinction
Bscat	Light Scattering
CAA	Clean Air Act
CBSA	Core Based Statistical Area
CEDES	Commission for Ecology and Sustainable Development
CFR	Code of Federal Regulations
CIA	Class I area
CO	Carbon Monoxide
CSN	Chemical Speciation Network
DCS	Data Collection System
DM&QA	Data Management and Quality Assurance Unit
DQO	Data Quality Objective
E-BAM	Environmental Proof - Beta Attenuation Monitor
EDO	Environmental Data Operation
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
HAP	Hazardous Air Pollutants
ICPMS	Inductively Coupled Plasma Mass Spectrometry
IMPROVE	Interagency Monitoring of PROtected Visual Environments
MCAQD	Maricopa County Air Quality Department
MET	Meteorological Measurements (wind, temperature, relative humidity)
MQO	Measurement Quality Objective
MSA	Metropolitan Statistical Area
$\mu\text{g}/\text{m}^3$	Micrograms per Cubic Meter
NAAQS	National Ambient Air Quality Standard
NAREL	National Air and Radiation Environmental Laboratory
NATA	National Air Toxics Assessment
NATTS	National Air Toxics Trends Station
NCore	National Core multipollutant monitoring stations
NIST	National Institute of Standards and Technology
NM	National Monument
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen oxides
NO <sub>y</sub>	Reactive Nitrogen Oxides

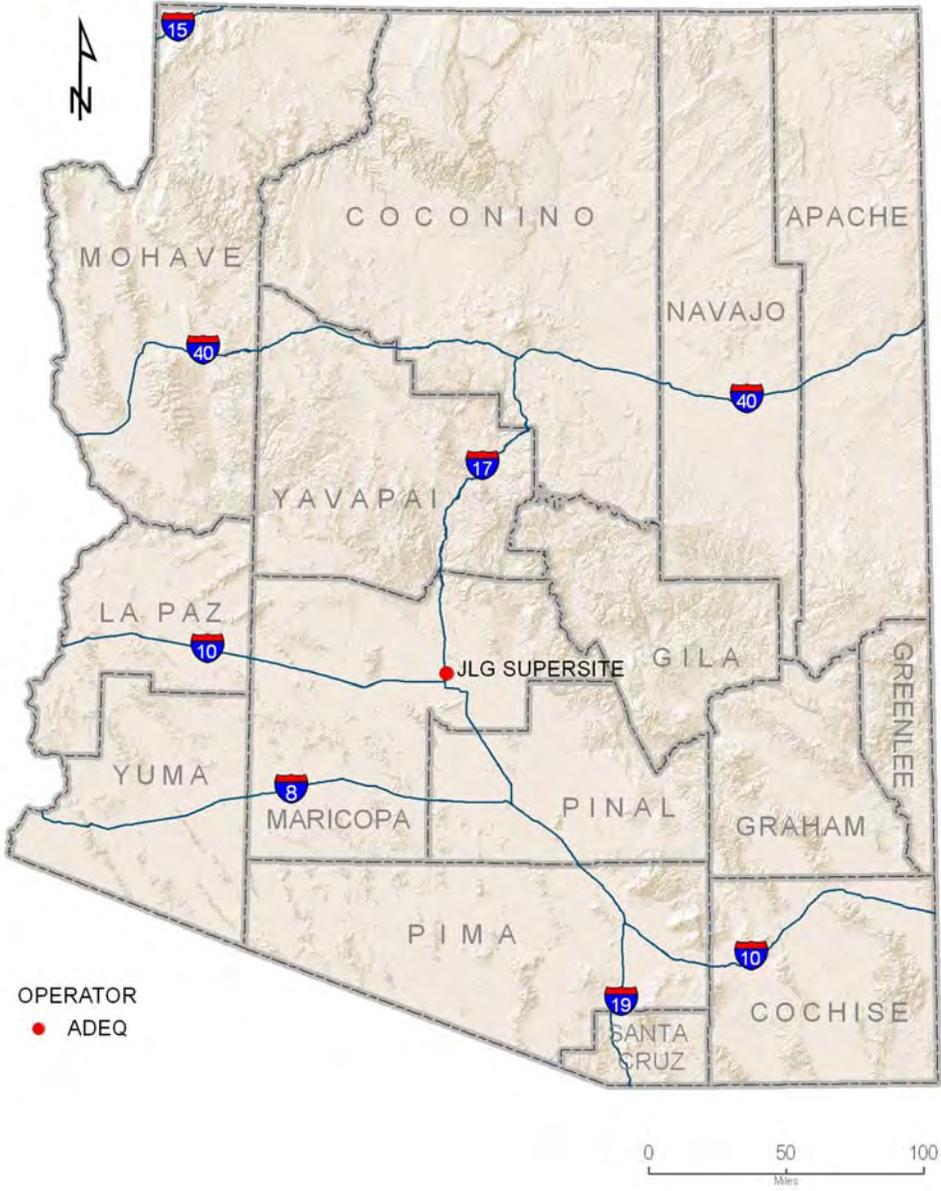
NPAP	National Performance Audit Program
NPS	National Park Service
NRO	Northern Regional Office
NWS	National Weather Service
O <sub>3</sub>	Ozone
OAQPS	Office of Air Quality Planning and Standards
PAHs	Polyaromatic Hydrocarbons
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PCAQCD	Pinal County Air Quality Control District
PDEQ	Pima County Department of Environmental Quality
PE	Performance Evaluation
PEP	Performance Evaluation Program
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter < 10 microns
PM <sub>coarse</sub>	Coarse Particulate Matter 2.5 to 10 microns aerodynamic diameter
PM <sub>2.5</sub>	Particulate Matter < 2.5 microns
POC	Parameter Occurrence Code
ppb	Parts Per Billion
ppm	Parts Per Million
PQAO	Primary Quality Assurance Organization
PSD	Prevention of Significant Deterioration
PWEI	Populated Weighted Emissions Index
QA	Quality Assurance
QAPP	Quality Assurance Program and/or Project Plan
QAPjP	Quality Assurance Program Plan
QAPrP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
RASS	Radar Acoustic Sounding System
SEMARNAT	Secretariat of Environment and Natural Resources
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO <sub>2</sub>	Sulfur Dioxide
SOP	Standard Operating Procedure
SPM	Special Purpose Monitor
SRO	Southern Regional Office
STN	Speciation Trends Network
TAD	Technical Assistance Document
TEOM	Tapered Element Oscillating Microbalance
TSA	Technical System Audit
USFS	United States Forest Service
VOC	Volatile Organic Compound

## **Appendix B – Network Maps**

There are eleven maps in this section illustrating the location of ADEQ and Source monitors:

- CO Network
- NO<sub>2</sub> Network
- O<sub>3</sub> Network
- SO<sub>2</sub> Network
- Pb Network
- PM<sub>10</sub> Network
- PM<sub>2.5</sub> Network
- PM<sub>2.5</sub> EBAM Network
- Meteorological Network
- Urban Visibility Network
- IMPROVE Network & Class I Wilderness areas

# CO Network

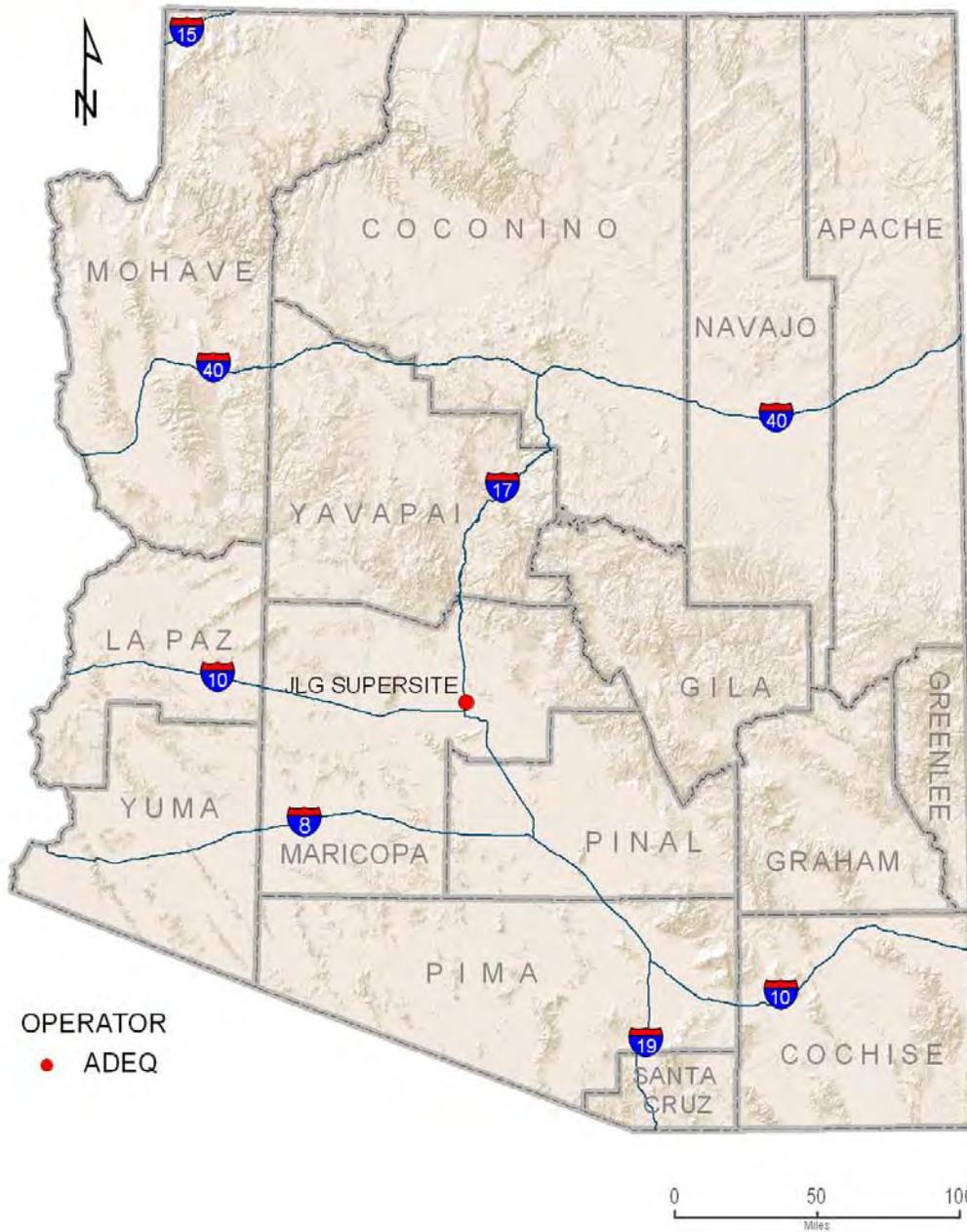


Source: AAAD



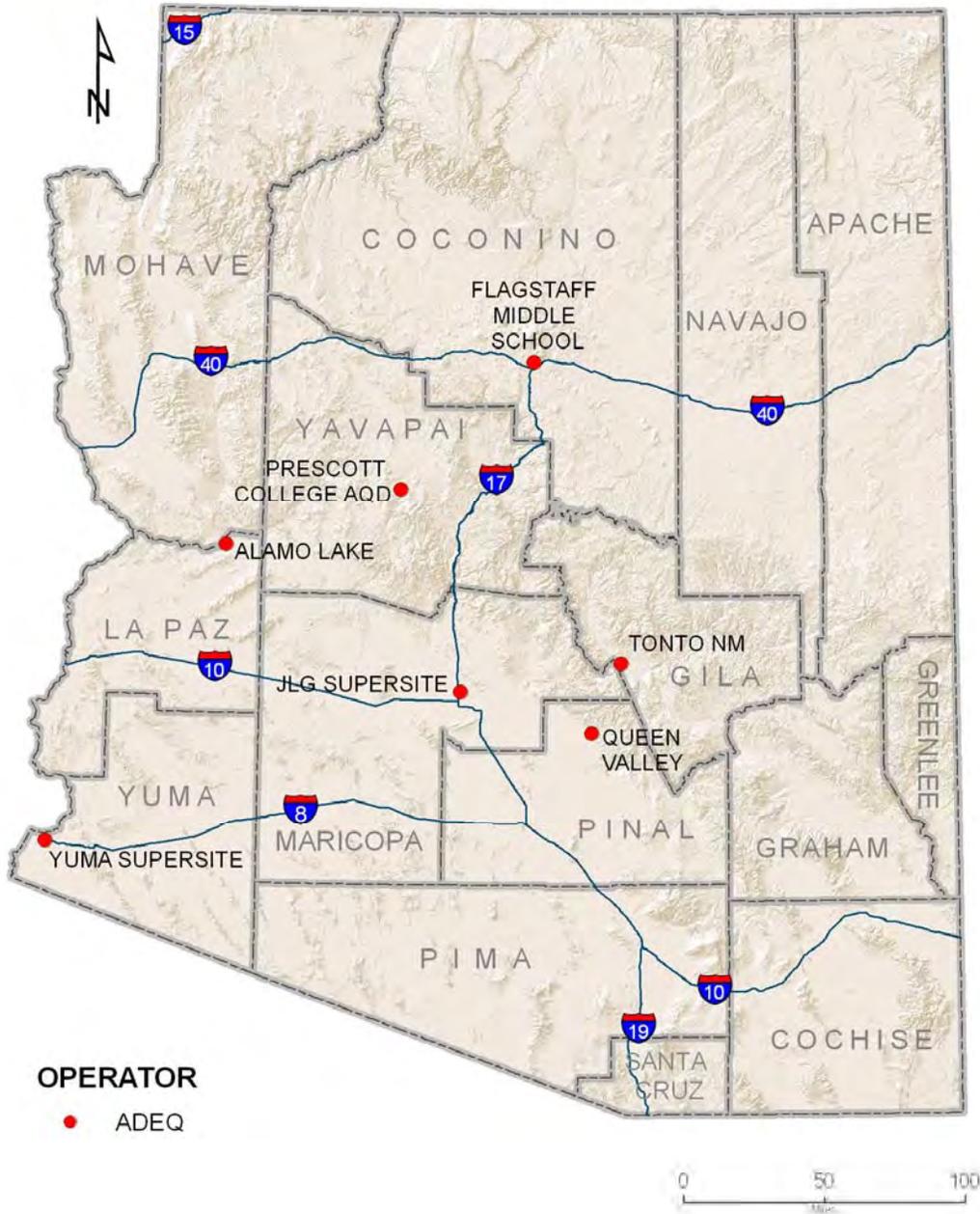
May 31, 2012 Author - N Caroli

# NO<sub>2</sub> Network



Source: AAAD  
**ADEQ**  
Arizona Department  
of Environmental Quality  
Janice K. Brewer, Governor  
Henry R. Darwin, Director  
May 31, 2012 Author - N Caroli

# O<sub>3</sub> Network



**OPERATOR**  
● ADEQ

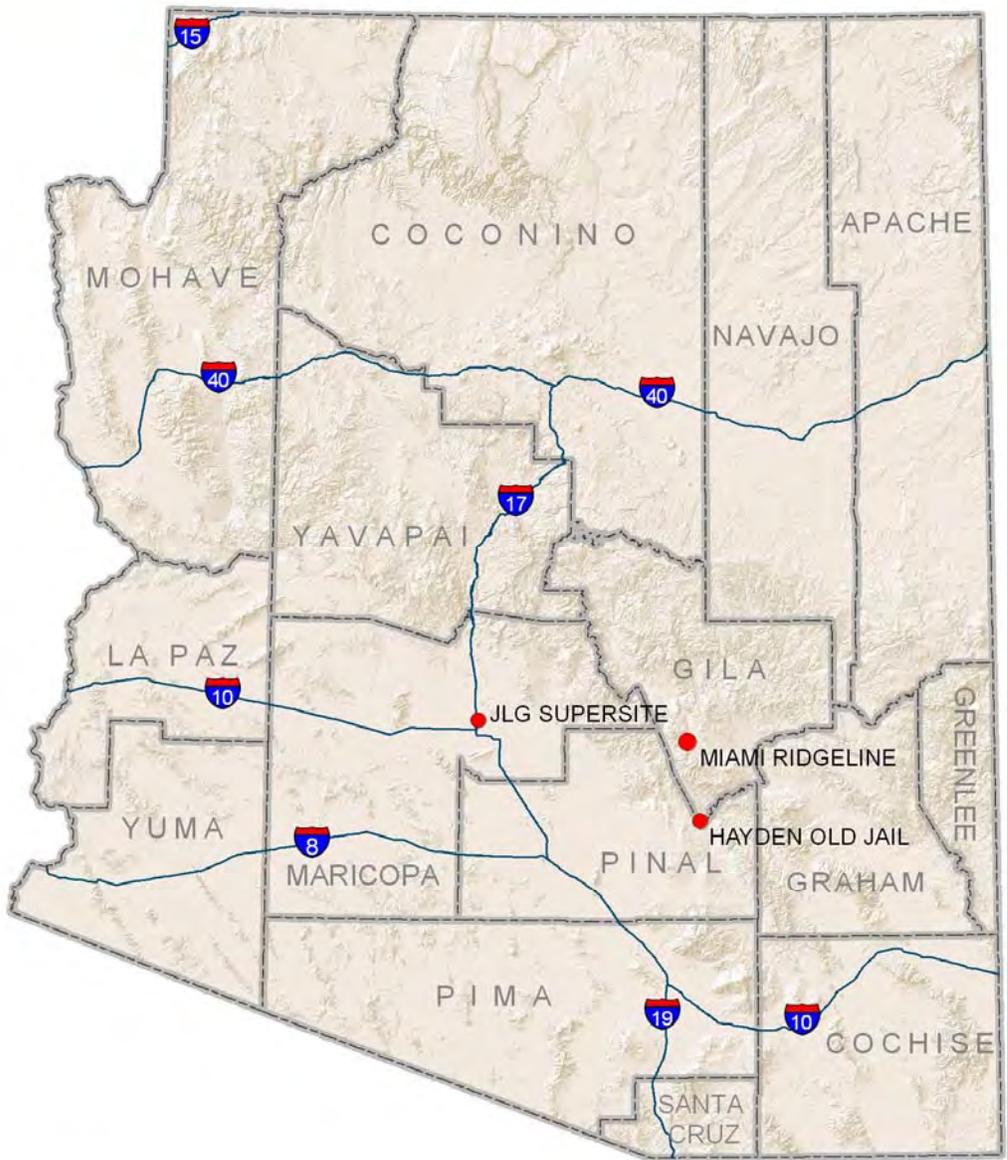
Source: AAAD

**ADEQ**  
 Arizona Department  
 of Environmental Quality

Janice K. Brewer, Governor  
 Henry R. Darwin, Director

May 31, 2012 Author - N Caroli

# SO<sub>2</sub> Network

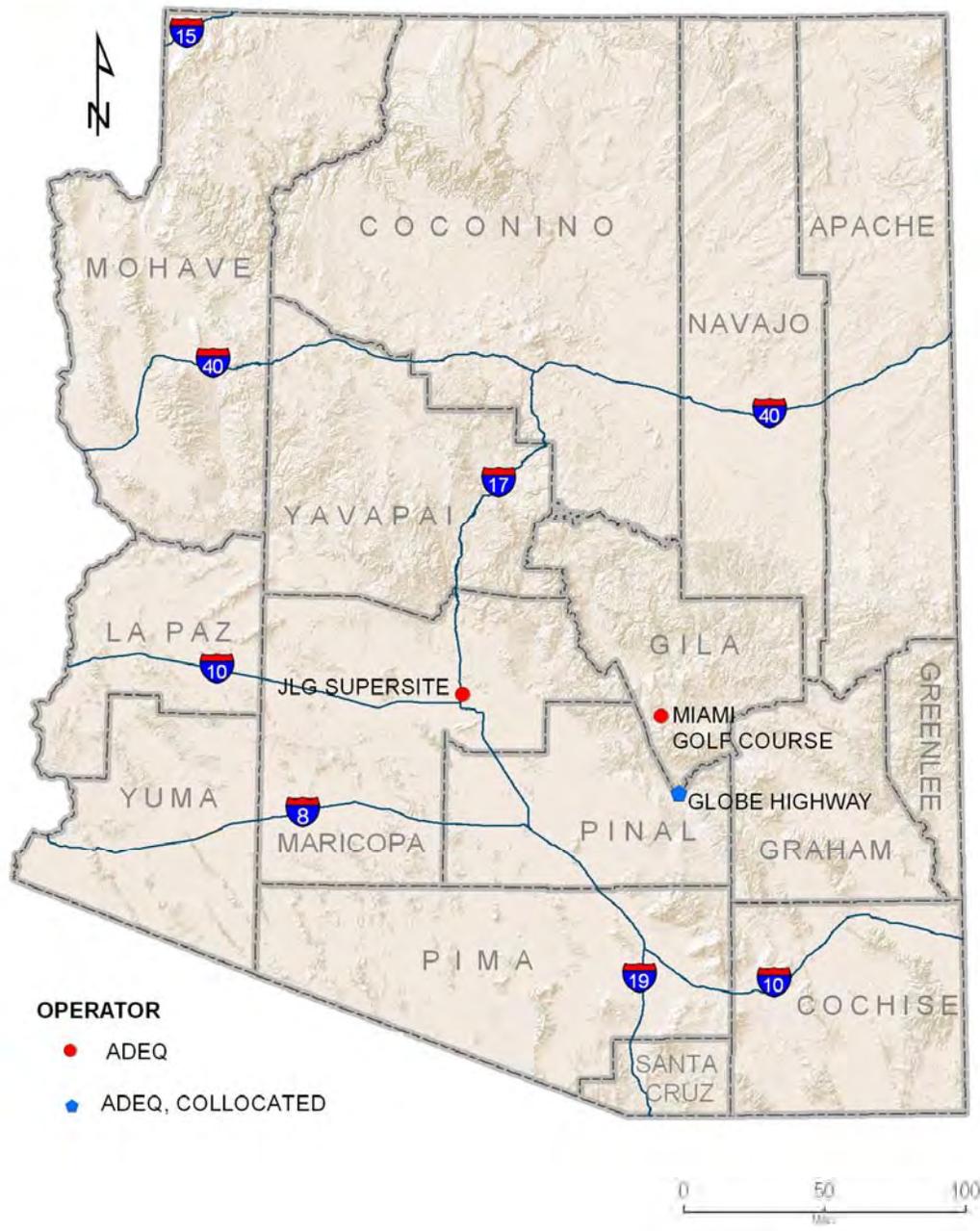


**OPERATOR**  
● ADEQ



June 04, 2012 Author - N Caroli

# P b Network



**OPERATOR**

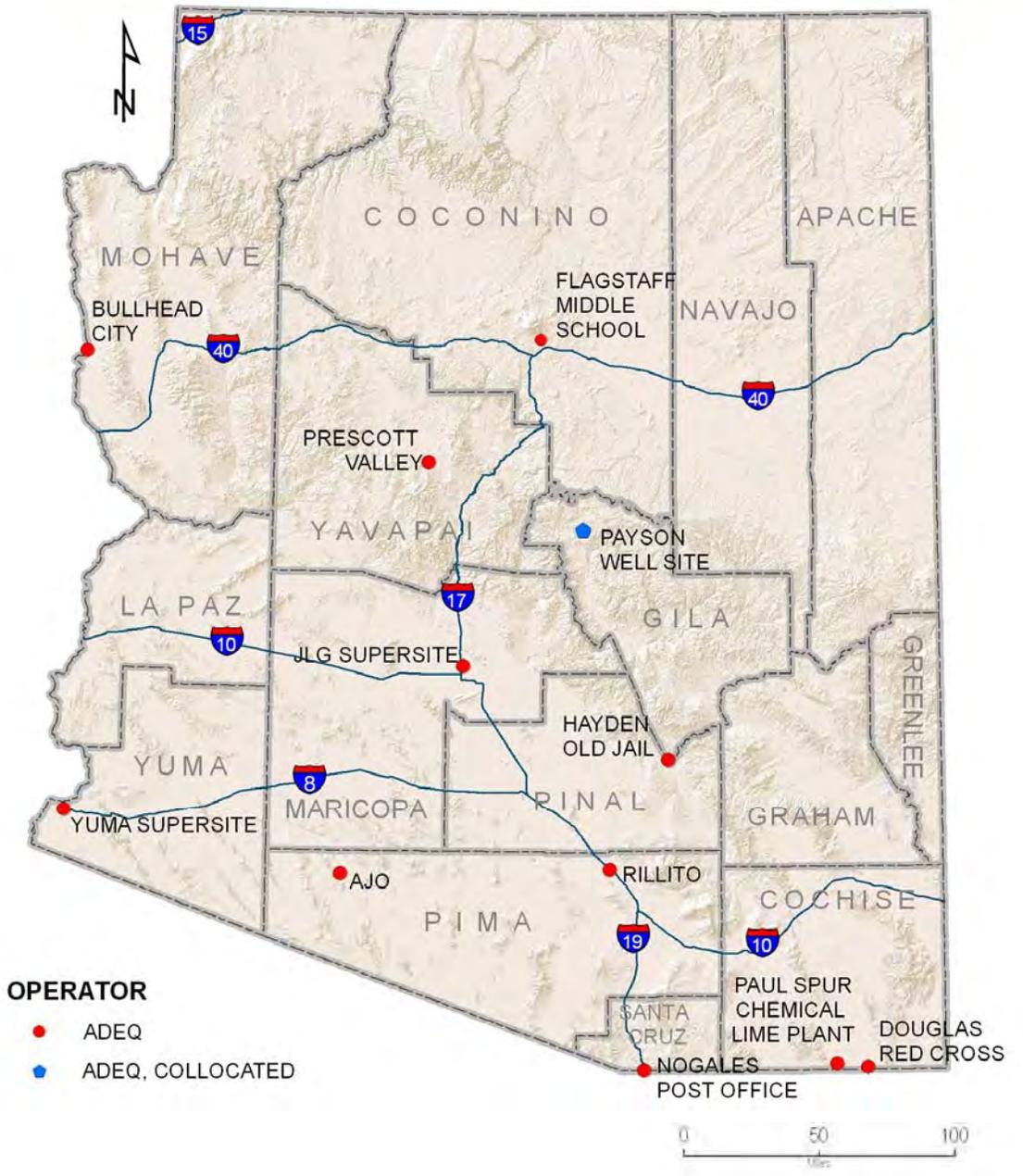
- ADEQ
- ◆ ADEQ, COLLOCATED

Pb NETWORK	
SITE	MONITOR TYPE
GLOBE HIGHWAY	Pb-TSP
MIAMI GOLF COURSE	Pb-TSP
JLG SUPERSITE	Pb-PM10

Source: AAAD  
**ADEQ**  
 Arizona Department  
 of Environmental Quality  
Lance E. Brown, Governor  
 Henry R. Osawa, Director

June 01, 2012 Author - N Caroli

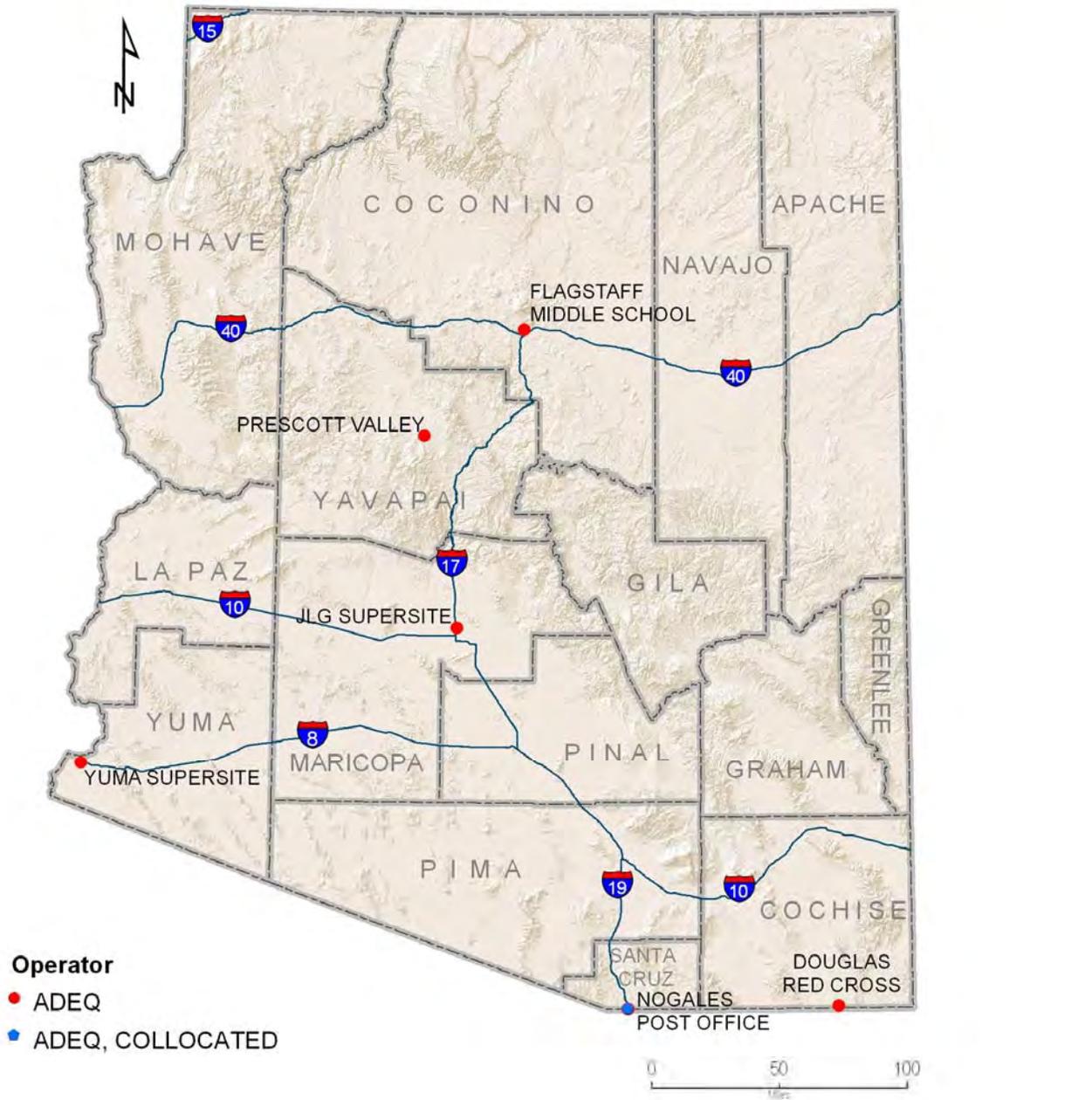
# P M<sub>10</sub> Network



- OPERATOR**
- ADEQ
  - ADEQ, COLLOCATED

Source: AAAD  
**ADEQ**  
 Arizona Department  
 of Environmental Quality  
 Janice K. Brewer, Governor  
 Henry R. Darwin, Director  
 June 01, 2012 Author - N Caroli

# PM<sub>2.5</sub> Network

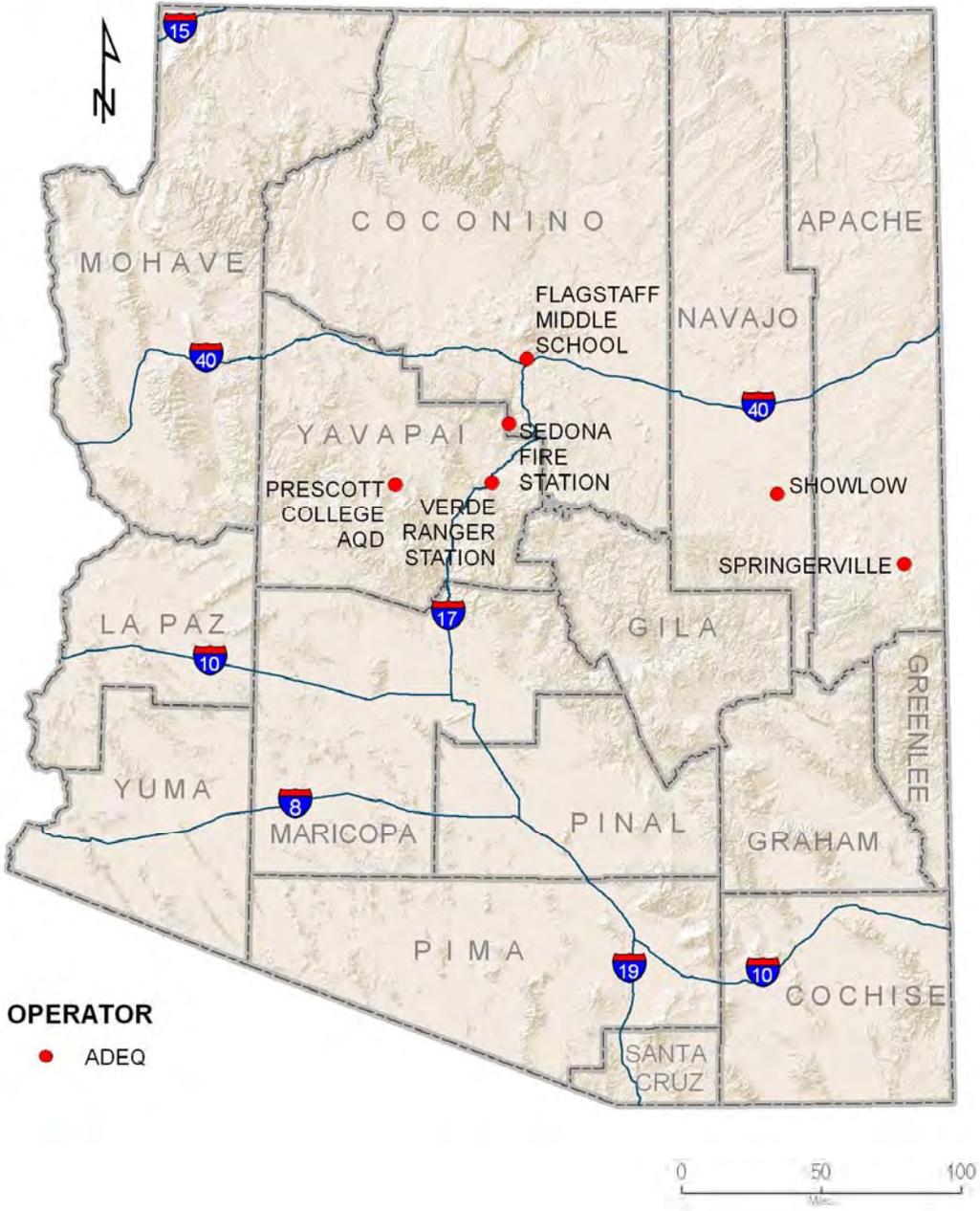


Source: AAAD



June 01, 2012 Author - N Caroli

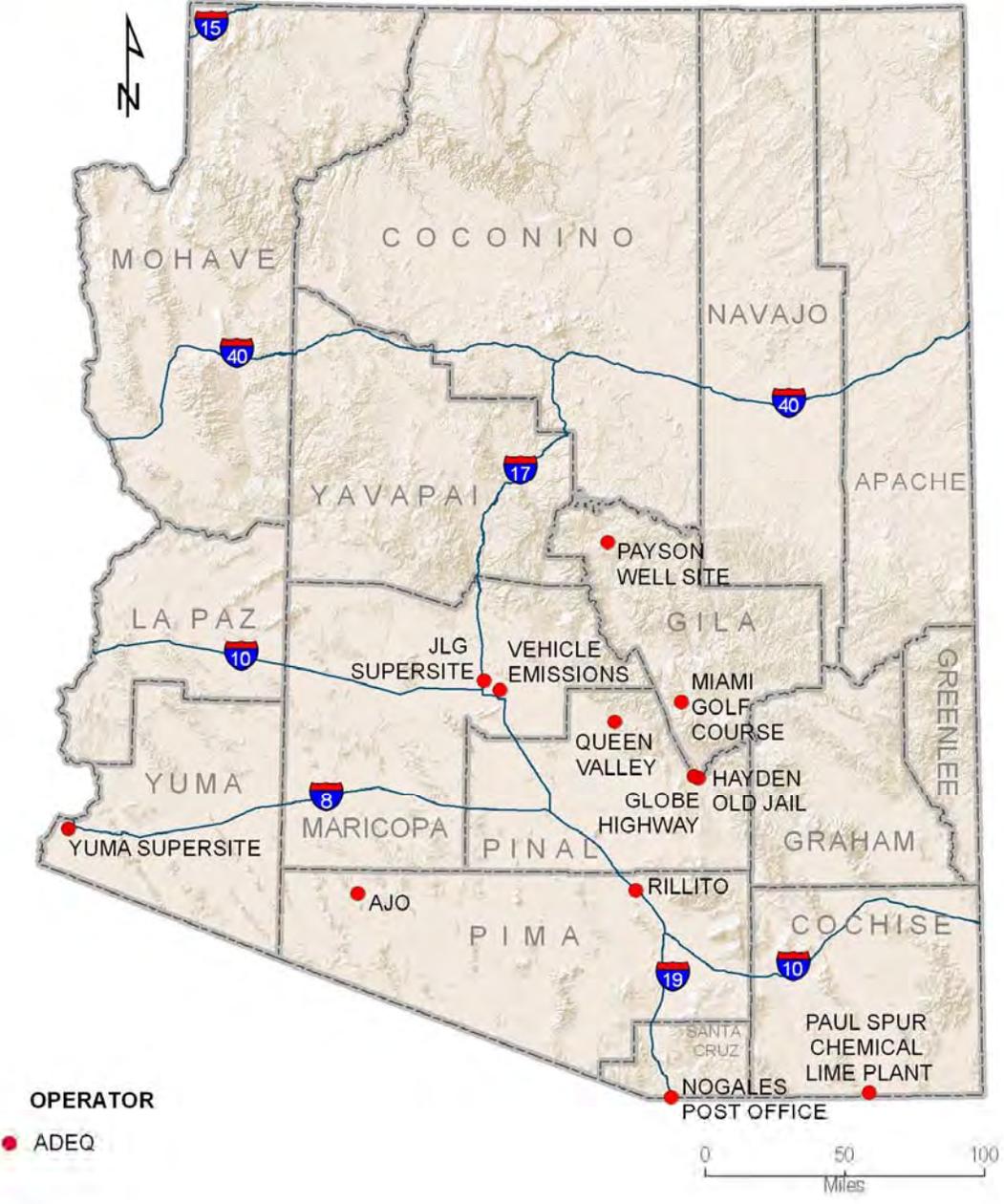
# PM<sub>2.5</sub> EBAM Network



Source: AAAD  
**ADEQ**  
Arizona Department  
of Environmental Quality  
Janice K. Brewer, Governor  
Henry K. Darwin, Director

May 31, 2012 Author - N Caroli

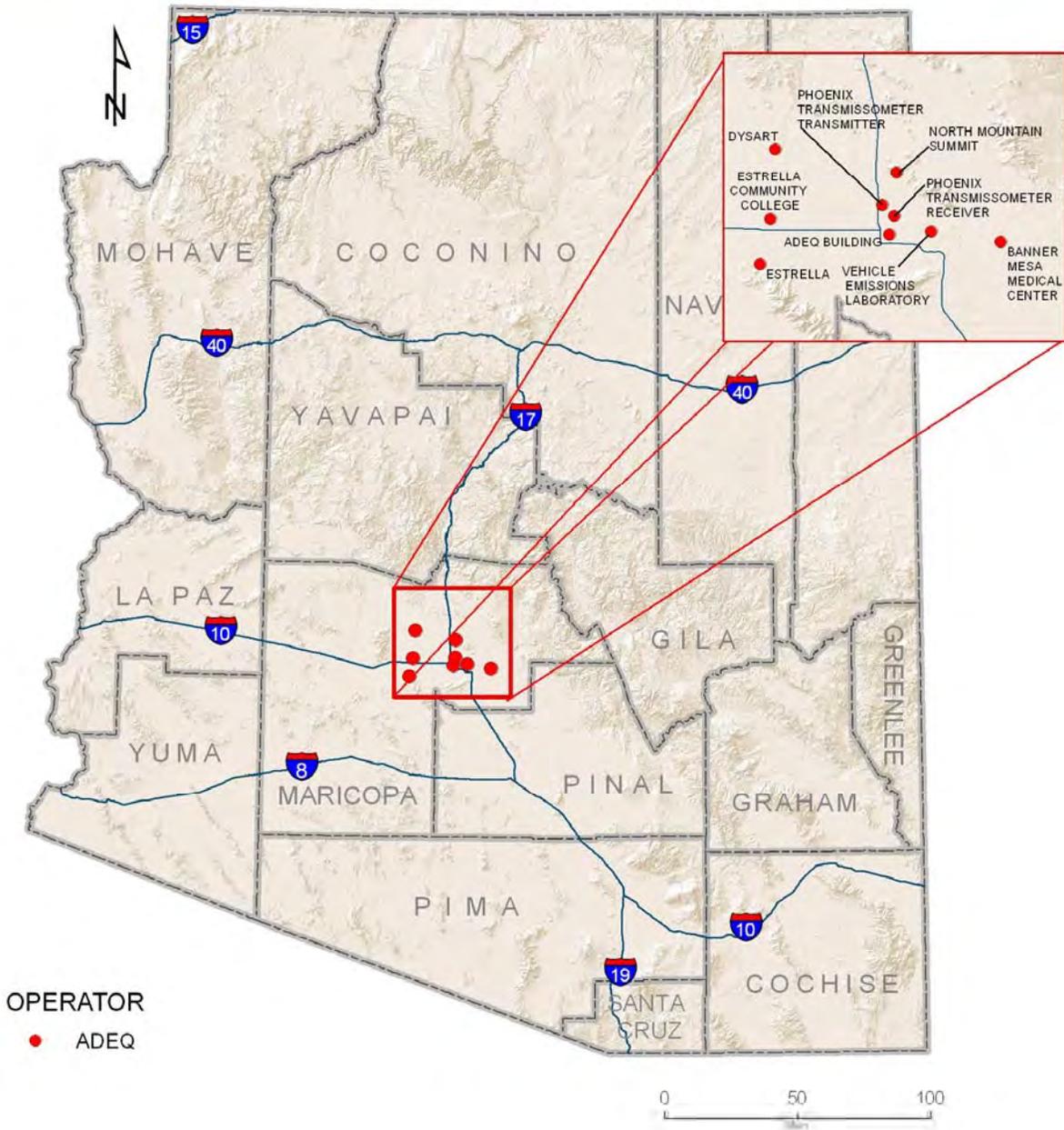
# Meteorological Network



**OPERATOR**  
 ● ADEQ

Source: AAAD  
**ADEQ**  
 Arizona Department  
 of Environmental Quality  
 Janice K. Brewer, Governor  
 Henry R. Darwin, Director  
 June 11, 2012 Author - N Caroli

# Urban Visibility Network

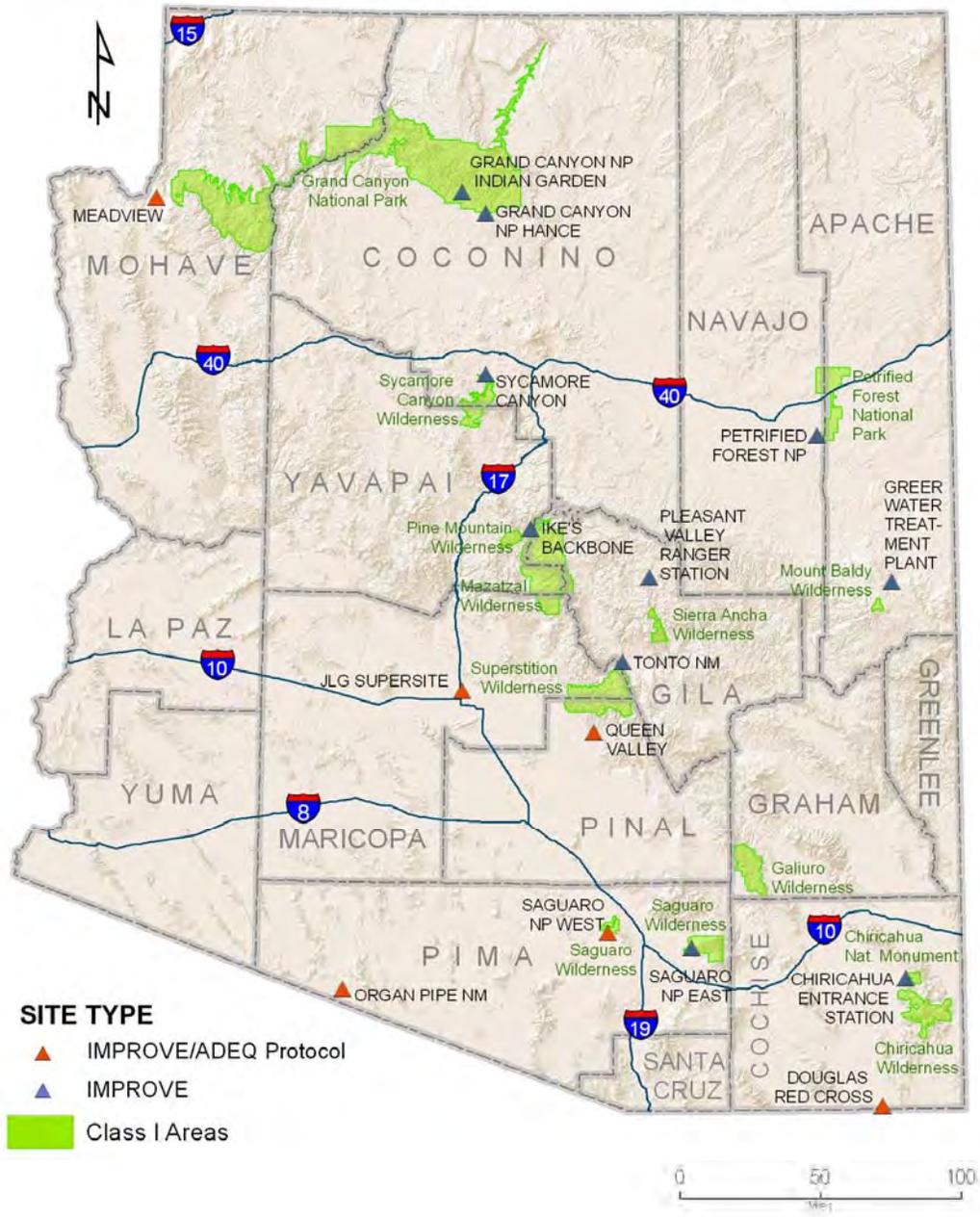


URBAN VISIBILITY NETWORK			
SITE	MONITOR TYPE	SITE	MONITOR TYPE
ADEQ BUILDING	CAMERA	NORTH MOUNTAIN SUMMIT	CAMERA
BANNER MESA MEDICAL CENTER	CAMERA	PHOENIX TRANSMISSOMETER RECEIVER	TRANSMISSOMETER
DYSART	NEPHELOMETER	PHOENIX TRANSMISSOMETER TRANSMITTER	TRANSMISSOMETER
ESTRELLA	NEPHELOMETER	VEHICLE EMISSIONS LABORATORY	NEPHELOMETER
ESTRELLA COMMUNITY COLLEGE	CAMERA		



May 31, 2012 Author - N Caroli

# IMPROVE Network & Class I Areas



May 30, 2012 Author - N Caroli

## Appendix C – Current Monitors by Program or Network

This appendix contains detailed information about monitors that are operated by ADEQ, or monitors that ADEQ has a strong association with (e.g. IMPROVE monitors). Only those monitors that are in operation at the time that this network plan was created are included in this appendix. Monitors that are proposed to be installed or those that were discontinued prior to the creation of this network plan are not included in this appendix. Since individual pollutants or networks have specific monitoring or siting criteria, this appendix was created so that siting criteria can be easily identified and evaluated throughout a program or network. See Appendix D for detailed information on specific monitoring sites.

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## Definitions for Appendix C – Current Monitors by Program or Network

Monitor	<i>The pollutant(s) or the atmospheric parameter(s) being monitored at the site</i>
CBSA	<i>Core Based Statistical Area that the site is located within. A CBSA is a U.S. geographic area defined by the Office of Management and Budget based around an urban center of at least 10,000 people and adjacent areas that are socioeconomically tied to the urban center by commuting.</i>
Site	<i>Official name for the site as written in ADEQ's AZURITE / AAAD database</i>
Objective	<i>A brief description of the intended purpose of the monitor's measurements (maximum concentration, population exposure, source-oriented, background, transport, visibility or welfare based)</i>
Spatial scale	<i>Area represented by an air quality monitor (microscale: 0 – 100 m, middle scale: 0.1 – 0.5 km, neighborhood: 0.5 – 4 km, urban: 4 – 50 km, regional: ~50 – 500 km, or national/global)</i>
Monitor start date	<i>Date that a pollutant, parameter, or measurement was started at the site</i>
Instrument	<i>Specific make and model of physical device used to collect air samples or take measurements</i>
Instrument start date	<i>The date that the current type of instrument (i.e. method) began operation at the site</i>
Instrument location	<i>The physical location of the instrument within the site (e.g. rooftop, shelter, tower, etc.)</i>
Analysis method	<i>The method used to analyze collected pollutant or collect measurements</i>
Method code	<i>An AQS code representing a particular method for collecting samples of the specified pollutant parameter</i>
Sampling schedule	<i>Frequency the instrument collects samples or measurements (e.g. hourly, daily, 1-in-3, 1-in-6, etc.)</i>
Sampling duration	<i>Length of time instrument collects samples or measurements (e.g. 1-hour, 24-hour, etc.)</i>
Sampling season	<i>Period that the instrument collects samples or measurements throughout a given year (typically expressed as a range of months)</i>
Probe height from ground	<i>Distance the probe is from the ground in meters (O<sub>3</sub> and SO<sub>2</sub> probes must be between 2 and 15 meters; others pollutants must be between 2 to 7 meters; meteorology typically 2 or 10 meters)</i>
Probe distance from structure	<i>Horizontal or vertical distance probe is from the supporting structure in meters</i>
Probe material	<i>Type of material probe is made of (SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub> must have FEP Teflon or borosilicate glass; PAMS and VOCs must be borosilicate glass or stainless steel)</i>
Residence time	<i>Number of seconds it takes a sample of air to travel from the inlet to the instrument (reactive gases must be less than 20 seconds)</i>
Distance from obstructions	<i>Distance the instrument is from the closest obstruction(s) in meters (probes and inlets must be at least 1 meter from obstructions)</i>
Distance from trees	<i>Distance the instrument is from the nearest tree in meters (must be a minimum of 10 meters from drip line)</i>

Unrestricted airflow degrees	<i>Angular measure (in degrees) of the area around an instrument that is free from obstructions (minimum of 270°)</i>
Distance between collocated monitors	<i>Distance between the centers of collocated instruments in meters (must be between 1 and 4 meters)</i>
In climate controlled shelter?	<i>An indication as to whether the site has a climate controlled area for the particular monitor (Yes or No)</i>
One-point QC check frequency	<i>Frequency at which zero/span/precision checks occur for gaseous instruments (daily, weekly, bi-weekly, monthly)</i>
Flow rate verification frequency	<i>Frequency at which flow rate verifications occur for particulate instruments (daily, weekly, bi-weekly, monthly)</i>
Monitor audit frequency	<i>Frequency at which independent performance audits occur (quarterly, biannually, annual)</i>
PEP audit monitor?	<i>An indication as to whether a PM<sub>2.5</sub> or Pb monitor should be subjected to Performance Evaluation Program audits (Yes or No)</i>
NPAP audit monitor?	<i>An indication as to whether a gaseous monitor should be subjected to National Performance Audit Program audits (Yes or No)</i>
Data Submitted to AQS?	<i>An indication as to whether data from the monitor are loaded to EPA's AQS Database (Yes or No)</i>
Data Submitted to AirNOW?	<i>An indication as to whether data from the monitor are loaded to the AirNOW database (Yes or No)</i>
Protocol Site?	<i>An indication as to whether an IMPROVE monitor / site is a Protocol Site (Yes or No)</i>

Meteorology - Temp/RH					
CBSA	Payson	Payson	Phoenix-Mesa-Scottsdale	Payson	Nogales
Site	Globe Highway	Hayden Old Jail	JLG Supersite	Miami Golf Course	Nogales Post Office
Objective	Population	Population	Population	Population	Population
Spatial scale	Middle	Neighborhood	Neighborhood	Middle	Neighborhood
Monitor start date	4/15/2011	2/2/2011	7/1/1993	6/8/2011	8/11/2011
Instrument	Vaisala HMP 155 Probe	Vaisala HMP 45C Probe	Rotronics MP101A Probe	Vaisala HMP 155 Probe	Vaisala HMP 45C Probe
Instrument Start Date	4/15/2011	2/2/2011	1/15/2010	6/8/2011	8/11/2011
Instrument Location	Tower	Tower	Tower	Tower	Tower
Analysis method	None	None	None	None	None
Method code	--	--	--	--	--
Sampling schedule	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly	Hourly	Hourly
Sampling season	All year	All year	All year	All year	All year
Probe height from ground	2 m	2.3 m	2 m	2 m	5.2 m
Probe distance from structure	1 m	0.6 m	1 m	1 m	3 m
Distance from obstructions	32 m	0.6 m	8 m	--	13.1 m
Distance from trees	36 m	4.3 m	5 m	5 m	7.3 m
Unrestricted airflow degrees	360°	150°	210°	90°	360°
In climate-controlled shelter?	N	N	N	N	N
Monitor audit frequency	Annual	Annual	Annual	Annual	Annual
Data submitted to AQS?	N	N	Y	N	N
Data submitted to AirNOW?	N	N	N	N	N

Meteorology - Temp/RH - continued					
CBSA	Sierra Vista-Douglas	Payson	Phoenix-Mesa-Scottsdale	Pima	Yuma
Site	Paul Spur Chemical Lime Plant	Payson Well Site	Queen Valley	Rillito	Yuma Supersite
Objective	Source	Population	Population	Source	Population
Spatial scale	Middle	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	12/1/2011	5/30/1991	6/23/2003	3/30/2010	3/17/2010
Instrument	Vaisala HMP 155 Probe	Vaisala HMP 45C Probe	Vaisala HMP 45C Probe	Vaisala HMP 45C Probe	Vaisala HMP 155 Probe
Instrument Start Date	12/1/2011	6/19/2003	4/19/2011	3/30/2010	3/17/2010
Instrument Location	Tower	Tower	Tower	Tower	Tower
Analysis method	None	None	None	None	None
Method code	--	--	--	--	--
Sampling schedule	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly	Hourly	Hourly
Sampling season	All year	All year	All year	All year	All year
Probe height from ground	2.7 m	3 m	2.4 m	2 m	2 m
Probe distance from structure	0.9 m	1 m	1 m	1 m	1 m
Distance from obstructions	2 m	7 m	7.3 m	1 m	1 m
Distance from trees	9 m	5 m	1.2 m	18 m	--
Unrestricted airflow degrees	360°	250°	180°	360°	220°
In climate-controlled shelter?	N	N	N	N	N
Monitor audit frequency	Annual	Annual	Annual	Annual	Annual
Data submitted to AQS?	N	N	Y	N	N
Data submitted to AirNOW?	N	N	N	N	N

Meteorology - Wind

CBSA	Tucson	Payson	Payson	Phoenix-Mesa-Scottsdale	Payson	Nogales
Site	Ajo	Globe Highway	Hayden Old Jail	JLG Supersite	Miami Golf Course	Nogales Post Office
Objective	Population	Population	Population	Population	Population	Population
Spatial scale	Neighborhood	Middle	Neighborhood	Neighborhood	Middle	Neighborhood
Monitor start date	7/1/1969	4/15/2011	2/2/2011	7/1/1993	6/8/2011	1/1/1980
Instrument	RM Young 5103 Anemometer	RM Young 5305 Anemometer	RM Young 5103 Anemometer			
Instrument Start Date	6/11/2003	4/15/2011	2/2/2011	7/1/1993	6/8/2011	6/13/2003
Instrument Location	Tower	Tower	Tower	Tower	Tower	Pole
Analysis method	None	None	None	None	None	None
Method code	40	40	40	40	40	40
Sampling schedule	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
Sampling season	All year					
Probe height from ground	11.3 m	10 m	10 m	10 m	10 m	12 m
Distance from obstructions	--	--	--	8 m	--	--
Distance from trees	9 m	--	2 m	5 m	10 m	--
Unrestricted airflow degrees	360°	360°	360°	360°	360°	360°
In climate-controlled shelter?	N	N	N	N	N	N
Monitor audit frequency	Annual	Annual	Annual	Biannual	Annual	Annual
Data submitted to AQS?	N	N	N	Y	N	N
Data submitted to AirNOW?	N	N	N	N	N	N

Meteorology - Wind - continued

CBSA	Sierra Vista-Douglas	Payson	Phoenix-Mesa-Scottsdale	Tucson	Phoenix-Mesa-Scottsdale	Yuma
Site	Paul Spur Chemical Lime Plant	Payson Well Site	Queen Valley	Rillito	Vehicle Emissions Laboratory	Yuma Supersite
Objective	Source	Population	Population	Source	Population	Population
Spatial scale	Middle	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	12/1/2011	5/30/1991	6/23/2003	1/8/2004	5/11/1999	3/17/2010
Instrument	RM Young 5305 Anemometer	RM Young 5103 Anemometer	RM Young 5103 Anemometer	RM Young 5103 Anemometer	RM Young 5305 Anemometer	RM Young 5305 Anemometer
Instrument Start Date	12/1/2011	5/30/1991	4/19/2011	1/8/2004	5/11/1999	3/17/2010
Instrument Location	Tower	Tower	Tower	Tower	Tower	Tower
Analysis method	None	None	None	None	None	None
Method code	40	40	40	40	40	40
Sampling schedule	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
Sampling season	All year	All year	All year	All year	All year	All year
Probe height from ground	10 m	10 m	10 m	10 m	10 m	10 m
Distance from obstructions	--	7 m	73 m	20 m	30 m	50 m
Distance from trees	9 m	5 m	--	20 m	50 m	--
Unrestricted airflow degrees	360°	360°	360°	360°	360°	360°
In climate-controlled shelter?	N	N	N	N	N	N
Monitor audit frequency	Annual	Annual	Annual	Annual	Annual	Annual
Data submitted to AQS?	N	N	Y	N	N	N
Data submitted to AirNOW?	N	N	N	N	N	N

Non-regulatory - SPM							
Monitor	PM2.5	PM2.5	PM2.5	PM2.5	PM2.5	PM2.5	PM2.5
CBSA	Flagstaff	Nogales	Prescott	Flagstaff	Navajo	None	Prescott
Site	Flagstaff Middle School	Nogales Post Office	Prescott College AQD	Sedona Fire Station AQD	Show Low	Springerville	Verde Ranger Station
Objective	Population	Population	Population	Population	Population	Population	Population
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	8/27/2001	4/1/1999	7/13/2011	12/16/2011	6/8/2011	6/8/2011	8/2/2011
Instrument	Met One E-BAM	Met One 1020 BAM	Met One E-BAM	Met One E-BAM	Met One E-BAM	Met One E-BAM	Met One E-BAM
Instrument Start Date	7/14/2011	2/2/2004	7/13/2011	12/16/2011	6/8/2011	6/8/2011	8/2/2011
Instrument Location	Rooftop	Rooftop	Rooftop	Rooftop	Rooftop	Rooftop	Metal Platform
Analysis method	Beta Ray Attenuation	Beta Ray Attenuation	Beta Ray Attenuation	Beta Ray Attenuation	Beta Ray Attenuation	Beta Ray Attenuation	Beta Ray Attenuation
Method code	--	731	--	--	--	--	--
Sampling schedule	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
Sampling season	All year	All year	All year	All year	All year	All year	All year
Probe height from ground	6 m	8 m	6 m	3.6 m	5 m	8 m	3.5 m
Probe distance from structure	--	--	--	--	--	--	--
Distance from obstructions	10 m	11.9 m	--	3 m	--	--	--
Distance from trees	15 m	10 m	7 m	--	10 m	30 m	30 m
Unrestricted airflow degrees	300°	300°	250°	300°	220°	250°	360°
In climate-controlled shelter?	N	Y	N	N	N	N	N
Flow-rate verification frequency	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
Monitor audit frequency	--	Biannual	--	--	--	--	--
Data submitted to AQS?	N	Y	N	N	N	N	N
Data submitted to AirNOW?	N	Y	N	N	N	N	N

NAAQS - SLAMS - CO	
CBSA	Phoenix-Mesa-Scottsdale
Site	JLG Supersite
Objective	Population
Spatial scale	Neighborhood
Monitor start date	7/1/1993
Instrument	Ecotech EC 9830 CO Analyzer
Instrument Start Date	12/15/2011
Instrument Location	Shelter
Analysis method	Gas Filter Correlation
Method code	588
Sampling schedule	Continuous
Sampling duration	Hourly
Sampling season	All Year
Probe height from ground	5 m
Probe material	Borosilicate Glass Funnel / FEP Teflon Sample Line
Residence time	16.14 sec
Distance from obstructions	8 m
Distance from trees	5 m
Unrestricted airflow degrees	210°
In climate-controlled shelter?	Y
One-point QC check frequency	Every 2 weeks
Monitor audit frequency	Annual
NPAP audit monitor?	Y
Data submitted to AQS?	Y
Data submitted to AirNOW?	Y

NAAQS - SLAMS - NO2

CBSA	Phoenix-Mesa-Scottsdale
Site	JLG Supersite
Objective	Population
Spatial scale	Neighborhood
Monitor start date	7/1/1993
Instrument	Thermo 42C NOx Analyzer
Instrument Start Date	7/1/1993
Instrument Location	Shelter
Analysis method	Chemiluminescence
Method code	74
Sampling schedule	Continuous
Sampling duration	Hourly
Sampling season	All Year
Probe height from ground	5 m
Probe distance from structure	2m
Probe material	Borosilicate Glass Funnel / FEP Teflon Sample Line
Residence time	15.69 sec
Distance from obstructions	8 m
Distance from trees	5 m
Unrestricted airflow degrees	210°
In climate-controlled shelter?	Y
One-point QC check frequency	Every 2 weeks
Monitor audit frequency	Annual
NPAP audit monitor?	Y
Data submitted to AQS?	Y
Data submitted to AirNOW?	N

NAAQS - SLAMS - O3

CBSA	None	Flagstaff	Phoenix-Mesa-Scottsdale	Prescott	Phoenix-Mesa-Scottsdale	Payson	Yuma
Site	Alamo Lake	Flagstaff Middle School	JLG Supersite	Prescott College AQD	Queen Valley	Tonto National Monument	Yuma Supersite
Objective	Transport	Population	Population	Population	Transport	Transport	Population
Spatial scale	Regional	Neighborhood	Urban	Neighborhood	Urban	Urban	Neighborhood
Monitor start date	5/20/2005	3/13/2008	7/1/1993	3/25/2008	1/1/1998	5/22/2002	5/6/2008
Instrument	Teledyne API 400E O3 Analyzer	Teledyne API 400E O3 Analyzer	Teledyne API 400E O3 Analyzer	Thermo 49C O3 Analyzer	Teledyne API 400E O3 Analyzer	Teledyne API 400E O3 Analyzer	Teledyne API 400E O3 Analyzer
Instrument Start Date	3/10/2011	3/11/2011	4/1/2011	2/10/2012	3/16/2011	3/16/2011	3/3/2011
Instrument Location	Shelter						
Analysis method	UV Photometric						
Method code	087	087	087	047	087	087	087
Sampling schedule	Continuous						
Sampling duration	Hourly						
Sampling season	March – Oct.	March – Oct.	All Year	March – Oct.	March – Oct.	March – Oct.	March – Oct.
Probe height from ground	5 m	10 m	5 m	6 m	5 m	6 m	5 m
Probe distance from structure	2 m	0.5 m	--	--	--	2 m	2 m
Probe material	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line
Residence time	2.95 sec	8.66 sec	15.71 sec	3.60 sec	3.46 sec	3.53 sec	4.99 sec
Distance from obstructions	7 m	--	8 m	--	73 m	--	35 m
Distance from trees	12 m	15 m	5 m	12 m	3 m	4 m	--
Unrestricted airflow degrees	360°	360°	210°	250°	360°	360°	360°
In climate-controlled shelter?	Y	Y	Y	Y	Y	Y	Y
One-point QC check frequency	Every 2 weeks						
Monitor audit frequency	Annual						
NPAP audit monitor?	Y	Y	Y	Y	Y	Y	Y
Data submitted to AQS?	Y	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	Y	Y	Y	Y	Y	Y	Y

NAAQS - SLAMS - SO2

CBSA	Payson	Phoenix-Mesa-Scottsdale	Payson
Site	Hayden Old Jail	JLG Supersite	Miami Ridgeline
Objective	Source	Population	Source
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitor start date	1/1/1975	3/3/2005	10/5/1995
Instrument	Thermo 43C SO2 Analyzer	Ecotech EC 9850 SO2 Analyzer	Thermo 43C SO2 Analyzer
Instrument Start Date	10/10/2001	6/1/2010	7/21/1999
Instrument Location	Shelter	Shelter	Shelter
Analysis method	Pulsed Fluorescence	Pulsed Fluorescence	Pulsed Fluorescence
Method code	60	592	60
Sampling schedule	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly
Sampling season	All year	All year	All year
Probe height from ground	5 m	5 m	4 m
Probe distance from structure	7 m	--	2 m
Probe material	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line
Residence time	4.85 sec	15.64 sec	5.13 sec
Distance from obstructions	7 m	8 m	5 m
Distance from trees	4.2 m	5 m	5 m
Unrestricted airflow degrees	360°	210°	180°
In climate-controlled shelter?	Y	Y	Y
One-point QC check frequency	Every 2 weeks	Every 2 weeks	Every 2 weeks
Monitor audit frequency	Annual	Annual	Annual
NPAP audit monitor?	Y	Y	Y
Data submitted to AQS?	Y	Y	Y
Data submitted to AirNOW?	Y	Y	Y

NAAQS - SLAMS - Pb

CBSA	Payson	Payson	Phoenix-Mesa-Scottsdale	Payson
Site	Globe Highway	Globe Highway	JLG Supersite	Miami Golf Course
Objective	Source	Source	Population	Source
Spatial scale	Middle	Middle	Neighborhood	Middle
Monitor start date	10/1/2010	10/1/2010	1/1/2005	10/1/2010
Instrument	Tisch TE-8550-BL TSP	Tisch TE-8550-BL TSP	R&P Partisol 2000	Tisch TE-8550-BL TSP
Instrument Start Date	10/1/2010	10/1/2010	1/1/2005	10/1/2010
Instrument Location	Platform	Platform	Metal Roof	Platform
Analysis method	ICP-MS with Heated Ultrasonic Nitric and Hydrochloric Acid Filter Extraction (TSP)	ICP-MS with Heated Ultrasonic Nitric and Hydrochloric Acid Filter Extraction (TSP)	ICP-MS with Heated Hot Block in Dilute Acid and Hydrogen Peroxide Filter Extraction (PM10)	ICP-MS with Heated Ultrasonic Nitric and Hydrochloric Acid Filter Extraction (TSP)
Method code	191	191	202	191
Sampling schedule	1 in 6	1 in 6	1 in 6	1 in 6
Sampling duration	24 hour	24 hour	24 hour	24 hour
Sampling season	All year	All year	All year	All year
Probe height from ground	2.5 m	2.5 m	5 m	3.5 m
Probe distance from structure	--	--	--	--
Distance from obstructions	3.7 m	3.7 m	8 m	--
Distance from trees	1.5 m	1.5 m	5 m	4 m
Unrestricted airflow degrees	330°	330°	210°	180°
Distance between collocated monitors	1.8 m	1.8 m	--	--
In climate-controlled shelter?	N	N	N	N
Flow-rate verification frequency	Every 12 days	Every 12 days	Monthly	Every 12 days
Monitor audit frequency	Quarterly	Quarterly	Biannual	Quarterly
PEP audit monitor?	Y	Y	N	Y
Data submitted to AQS?	Y	Y	Y	Y
Data submitted to AirNOW?	N	N	N	N

NAAQS - SLAMS - PM10

CBSA	Tucson	Lake Havasu City-Kingman	Sierra Vista-Douglas	Flagstaff	Payson	Phoenix-Mesa-Scottsdale	Nogales
Site	Ajo	Bullhead City	Douglas Red Cross	Flagstaff Middle School	Hayden Old Jail	JLG Supersite	Nogales Post Office
Objective	Population	Population	Population	Population	Source	Population	Population
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	2/11/1991	11/5/1997	9/2/1998	10/30/1996	1/6/1981	7/1/1993	1/1/1980
Instrument	R&P 1400AB TEOM	R&P Partisol 2000	R&P Partisol 2000	R&P Partisol 2000	R&P 1400 AB TEOM	Met One 1020 BAM	Thermo Partisol 2000
Instrument Start Date	2/19/2009	9/2/2003	4/1/2004	4/1/2004	3/3/2009	11/10/2010	8/27/2003
Instrument Location	Metal Platform	Rooftop	Metal Platform	Rooftop	Rooftop	Shelter	Rooftop
Analysis method	Tapered Element Oscillating Microbalance Technology	Gravimetric	Gravimetric	Gravimetric	Tapered Element Oscillating Microbalance Technology	Beta Ray Attenuation	Gravimetric
Method code	79	126	126	126	79	122	126
Sampling schedule	Continuous	1 in 6	1 in 6	1 in 6	Continuous	Continuous	1 in 6
Sampling duration	Hourly	24 hour	24 hour	24 hour	Hourly	Hourly	24 hour
Sampling season	All Year	All year	All year	All year	All year	All year	All year
Probe height from ground	3.5 m	5 m	3 m	6 m	5 m	5m	8 m
Probe distance from structure	--	--	--	--	--	--	--
Distance from obstructions	6.7 m	--	12 m	10 m	8 m	8 m	13.7 m
Distance from trees	9 m	11 m	6 m	15 m	15 m	5 m	7 m
Unrestricted airflow degrees	360°	360°	320°	300°	360°	210°	300°
Distance between collocated monitors	--	--	--	--	--	--	--
In climate-controlled shelter?	Y	N	N	N	Y	Y	N
Flow-rate verification frequency	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
Monitor audit frequency	Biannual	Biannual	Biannual	Biannual	Biannual	Biannual	Biannual
Data submitted to AQS?	Y	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	Y	N	N	N	Y	Y	N

NAAQS - SLAMS - PM10 continued

CBSA	Sierra Vista-Douglas	Sierra Vista-Douglas	Payson	Payson	Prescott	Tucson	Yuma
Site	Paul Spur Chemical Lime Plant	Paul Spur Chemical Lime Plant	Payson Well Site	Payson Well Site	Prescott Valley	Rillito	Yuma Supersite
Objective	Source	Source	Population	Population	Population	Source	Population
Spatial scale	Middle	Middle	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	1/6/1991	1/6/1991	1/1/1991	1/1/1991	3/16/2003	1/3/1985	12/1/2009
Instrument	Thermo Partisol 2000	R&P 1400 AB TEOM	R&P Partisol 2000	Thermo Partisol 2000	R&P Partisol 2000	R&P 1400 AB TEOM	R&P 1400 AB TEOM
Instrument Start Date	12/16/1997	1/12/2012	6/30/2003	7/1/2009	12/28/2007	3/30/2010	12/1/2009
Instrument Location	Metal Platform	Metal Platform	Metal Platform	Metal Platform	Rooftop	Metal Platform	Shelter
Analysis method	Gravimetric	Gravimetric	Gravimetric	Gravimetric	Gravimetric	Tapered Element Oscillating Microbalance Technology	Tapered Element Oscillating Microbalance Technology
Method code	126	79	126	126	126	79	79
Sampling schedule	1 in 6	Continuous	1 in 6	1 in 6	1 in 6	Continuous	Continuous
Sampling duration	24 hour	Hourly	24 hour	24 hour	24 hour	Hourly	Hourly
Sampling season	All year	All year	All year	All year	All year	All year	All year
Probe height from ground	3 m	3 m	3 m	3 m	7 m	5 m	5 m
Probe distance from structure	--	--	--	--	--	--	2 m
Distance from obstructions	50 m	50 m	12 m	12 m	20 m	4 m	50 m
Distance from trees	5 m	5 m	5 m	5 m	--	20 m	--
Unrestricted airflow degrees	360°	360°	300°	300°	360°	360°	360°
Distance between collocated monitors	--	--	2 m	2 m	--	--	--
In climate-controlled shelter?	N	Y	N	N	N	Y	Y
Flow-rate verification frequency	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
Monitor audit frequency	Biannual	Biannual	Biannual	Biannual	Biannual	Biannual	Biannual
Data submitted to AQS?	Y	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	N	Y	N	N	N	Y	Y

NAAQS - SLAMS - PM2.5

CBSA	Sierra Vista-Douglas	Flagstaff	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Nogales	Nogales
Site	Douglas Red Cross	Flagstaff Middle School	JLG Supersite	JLG Supersite	Nogales Post Office	Nogales Post Office
Objective	Population	Population	Population	Population	Population	Population
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	11/2/2000	8/27/2001	7/1/2003	7/1/2003	4/1/1999	4/1/1999
Instrument	R&P Partisol 2000	R&P Partisol 2000	R&P Partisol 2000	Met One 1020 BAM	R&P Partisol 2000	R&P Partisol 2000
Instrument Start Date	4/1/2004	9/16/2003	7/1/2011	11/10/2010	9/26/2003	9/26/2003
Instrument Location	Metal Platform	Rooftop	Metal Roof	Shelter	Rooftop	Rooftop
Analysis method	Gravimetric	Gravimetric	Gravimetric	Beta Ray Attenuation	Gravimetric	Gravimetric
Method code	143	143	143	170	143	143
Sampling schedule	1 in 6	1 in 6	1 in 3	Continuous	1 in 6	1 in 6
Sampling duration	24 hour	24 hour	24 hour	Hourly	24 hour	24 hour
Sampling season	All year	All year	All Year	All year	All year	All year
Probe height from ground	3 m	6 m	5 m	5m	8 m	7 m
Probe distance from structure	--	--	--	--	--	--
Distance from obstructions	9 m	10 m	8 m	8 m	10.4 m	8 m
Distance from trees	6 m	15 m	5 m	5 m	12 m	10 m
Unrestricted airflow degrees	320°	300°	210°	210°	300°	300°
Distance between collocated monitors	--	--	--	--	2 m	2 m
In climate-controlled shelter?	N	N	N	Y	N	N
Flow-rate verification frequency	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
Monitor audit frequency	Biannual	Biannual	Biannual	Biannual	Biannual	Biannual
PEP audit monitor?	Y	Y	Y	--	Y	Y
Data submitted to AQS?	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	N	N	N	Y	N	N

NAAQS - NCore						
Monitor	CO	NOy	O3	SO2	Pb-PM10	PM10-2.5
CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	JLG Supersite	JLG Supersite				
Objective	Population	Population	Population	Population	Population	Population
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	7/1/1993	1/1/2011	7/1/1993	3/3/2005	1/1/2005	11/10/2010
Instrument	Ecotech 9830 CO Analyzer	Ecotech 9843 Reactive NOx	API Teledyne M400E O3 Analyzer	Ecotech 9850 SO2 Analyzer	R&P Partisol 2000	Paired Met One 1020 BAMs
Instrument Start Date	12/15/2011	4/1/2011	4/1/2011	6/1/2010	1/1/2005	11/10/2010
Instrument Location	Shelter	Shelter	Shelter	Shelter	Metal Roof	Shelter
Analysis method	Gas Filter Correlation	Chemiluminescence	UV Photometric	Pulsed Fluorescence	ICP-MS with Heated Hot Block in Dilute Acid and Hydrogen Peroxide Filter Extraction	Difference Method
Method code	588	591	087	592	202	185
Sampling schedule	Continuous	Continuous	Continuous	Continuous	1 in 6	Continuous
Sampling duration	Hourly	Hourly	Hourly	Hourly	24 hour	Hourly
Sampling season	All year	All year				
Probe height from ground	5 m	5 m	5 m	5 m	5 m	5m
Probe distance from structure	2 m	7 m	2 m	2 m	--	--
Probe material	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	--	--
Residence time	16.14 sec	13.08 sec	15.71 sec	15.64 sec	--	--
Distance from obstructions	8 m	8 m	8 m	8 m	8 m	8 m
Distance from trees	5 m	5 m	5 m	5 m	5 m	5 m
Unrestricted airflow degrees	210°	210°	210°	210°	210°	210°
In climate-controlled shelter?	Y	Y	Y	Y	N	N
One-point QC check frequency	Every 2 weeks	Every 2 weeks	Every 2 weeks	Every 2 weeks	--	--
Flow-rate verification frequency	--	--	--	--	Monthly	Monthly
Monitor audit frequency	Every 2 weeks	Every 2 weeks	Every 2 weeks	Every 2 weeks	Biannual	--
PEP audit monitor?	N	N	N	N	N	N
NPAP audit monitor?	Y	N	Y	Y	N	N
Data submitted to AQS?	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	Y	Y	Y	Y	N	N

NAAQS - NCore continued

Monitor	PM2.5	PM2.5	PM2.5 Speciation	PM2.5 Speciation	Temp/RH	Wind
CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite
Objective	Population	Population	Population	Population	Population	Population
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	7/1/2003	7/1/2003	2/21/2000	2/21/2000	7/1/1993	7/1/1993
Instrument	R&P Partisol 2000	Met One 1020 BAM	Met One Super SASS	URG 3000N	Rotronics MP101A Probe	RM Young 5103 Anemometer
Instrument Start Date	7/1/2011	11/10/2010	2/21/2000	10/1/2009	1/15/2010	7/1/1993
Instrument Location	Metal Roof	Metal Roof	Metal Roof	Metal Roof	Tower	Tower
Analysis method	Gravimetric	Beta Ray Attenuation	Energy Dispersive XRF & Ion Chromatography	IMPROVE A TOR & Various	None	None
Method code	145	170	811 & 812	831, 838, & Various	21	40
Sampling schedule	1 in 3	Continuous	1 in 3	1 in 3	Continuous	Continuous
Sampling duration	24 hour	Hourly	24 hour	24 hour	Hourly	Hourly
Sampling season	All year	All year	All year	All year	All year	All year
Probe height from ground	5 m	5 m	5 m	5 m	2 m	10 m
Probe distance from structure	--	--	--	--	--	--
Probe material	--	--	--	--	--	--
Residence time	--	--	--	--	--	--
Distance from obstructions	8 m	8 m	8 m	8 m	8 m	8 m
Distance from trees	5 m	5 m	5 m	5 m	5 m	5 m
Unrestricted airflow degrees	210°	210°	210°	210°	210°	360°
In climate-controlled shelter?	N	N	N	N	N	N
One-point QC check frequency	--	--	--	--	--	--
Flow-rate verification frequency	Monthly	Monthly	Monthly	Monthly	--	--
Monitor audit frequency	--	Biannual	Quarterly	Quarterly	Biannual	Biannual
PEP audit monitor?	Y	N	N	N	N	N
NPAP audit monitor?	N	N	N	N	N	N
Data submitted to AQS?	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	N	Y	N	Y	N	N

NAAQS - PAMS

Monitor	CO	NOx	O3	Carbonyl	Carbonyl	VOC	O3
CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	Queen Valley
Objective	Population	Population	Population	Population	Population	Population	Transport
Spatial scale	Neighborhood	Neighborhood	Urban	Urban	Urban	Urban	Urban
Monitor start date	7/1/1993	7/1/1993	7/1/1993	5/15/1999	5/15/1999	1/1/2003	1/1/1998
Instrument	Ecotech EC 9830 CO Analyzer	Thermo 42C NOx Analyzer	Teledyne API 400E O3 Analyzer	ATEC 8000 Carbonyl Cartridge Sampler	ATEC 8000 Carbonyl Cartridge Sampler	ATEC 8001 Canister Sampler	Teledyne API 400E O3 Analyzer
Instrument Start Date	12/15/2011	7/1/1993	4/1/2011	6/5/2007	6/5/2007	6/2/2011	3/16/2011
Instrument Location	Shelter	Shelter	Shelter	Shelter	Shelter	Shelter	Shelter
Analysis method	Gas Filter Correlation	Chemiluminescence	UV Photometric	TO-11A	TO-11A	TO-14	UV Photometric
Method code	588	74	087	202	202	126	087
Sampling schedule	Continuous	Continuous	Continuous	1 in 6	1 in 6	1 in 6	Continuous
Sampling duration	Hourly	Hourly	Hourly	24 hour	3 - 3 hour	24 hour	Hourly
Sampling season	All Year	All Year	All Year	All year	All year	June – Aug.	March – Oct.
Probe height from ground	5 m	5 m	5 m	5 m	5 m	4.5 m	5 m
Probe distance from structure	--	--	--	--	--	--	--
Probe material	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line	Stainless Steel Funnel / FEP Teflon Sample Line	Stainless Steel Funnel / FEP Teflon Sample Line	Stainless Steel Funnel / Stainless Steel Sample Line	Borosilicate Glass Funnel / FEP Teflon Sample Line
Residence time	16.14 sec	15.69 sec	15.71 sec	--	--	--	3.46 sec
Distance from obstructions	8 m	8 m	8 m	8 m	8 m	8 m	73 m
Distance from trees	5 m	5 m	5 m	5 m	5 m	5 m	3 m
Unrestricted airflow degrees	210°	210°	210°	210°	210°	210°	360°
In climate-controlled shelter?	Y	Y	Y	Y	Y	Y	Y
One-point QC check frequency	Every 2 weeks	Every 2 weeks	Every 2 weeks	Annual	Annual	Annual	Every 2 weeks
Monitor audit frequency	Annual	Annual	Annual	Annual	Annual	--	Annual
NPAP audit monitor?	Y	Y	Y	N	N	N	Y
Data submitted to AQS?	Y	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	Y	Y	Y	N	N	N	Y

NAAQS - PAMS continued

Monitor	NOy	VOC	Delta Temp	Total Horizontal Solar Radiation	Ultraviolet Solar Radiation	Wind Profiler
CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	Queen Valley	Queen Valley	Vehicle Emissions Laboratory	Vehicle Emissions Laboratory	Vehicle Emissions Laboratory	Vehicle Emissions Laboratory
Objective	Transport	Transport	Population	Population	Population	Population
Spatial scale	Urban	Urban	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	1/1/1998	5/20/2001	8/20/2004	6/18/1999	8/20/2004	1/1/1998
Instrument	Thermo 42C TL Reactive NOx	Met One 8001 Canister Sampler	RM Young RTD 7627 Delta Temp System	Li-Cor LI-200S2 Pyranometer	Epply TUVR Ultraviolet Sensor	Visalia LAP-3000 Wind Profiler
Instrument Start Date	5/9/2011	6/1/2010	8/20/2004	6/18/1999	8/20/2004	1/1/1998
Instrument Location	Shelter	Shelter	Tower	Tower	Tower	Ground
Analysis method	Chemiluminescence	TO-14	None	None	None	None
Method code	574	126	810	11	11	--
Sampling schedule	Continuous	1 in 6	Continuous	Continuous	Continuous	Continuous
Sampling duration	Hourly	24 hour	Hourly	Hourly	Hourly	Hourly
Sampling season	June – Aug.	June – Aug.	All year	All year	All year	All year
Probe height from ground	5 m	5 m	2 m & 9 m	5 m	5 m	--
Probe distance from structure	--	--	1 m	0.5 m	0.5 m	--
Probe material	Borosilicate Glass Funnel / FEP Teflon Sample Line	Stainless Steel Funnel / Stainless Steel Sample Line	--	--	--	--
Residence time	--	--	--	--	--	--
Distance from obstructions	73 m	30 m	30 m	30 m	35 m	5 m
Distance from trees	3 m	3 m	50 m	50 m	50 m	50 m
Unrestricted airflow degrees	360°	360°	360°	360°	360°	360°
In climate-controlled shelter?	Y	Y	N	N	N	N
One-point QC check frequency	Every 2 weeks	--	--	--	--	--
Monitor audit frequency	Annual	Every 3 Years	Annual	--	--	--
NPAP audit monitor?	Y	N	N	N	N	N
Data submitted to AQS?	Y	Y	N	Y	Y	N
Data submitted to AirNOW?	N	N	N	N	N	N

NAAQS - SPM			
Monitor	PM10	PM2.5	PM2.5
CBSA	Nogales	Prescott	Yuma
Site	Nogales Post Office	Prescott Valley	Yuma Supersite
Objective	Population	Population	Population
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitor start date	1/1/1980	12/28/2007	1/1/2010
Instrument	Met One 1020 BAM	Thermo Partisol 2000	R&P Partisol 2000
Instrument Start Date	2/2/2004	12/28/2007	1/1/2010
Instrument Location	Rooftop	Rooftop	Platform
Analysis method	Beta Ray Attenuation	Gravimetric	Gravimetric
Method code	122	143	143
Sampling schedule	Continuous	1 in 6	1 in 6
Sampling duration	Hourly	24 hour	24 hour
Sampling season	All year	All Year	All year
Probe height from ground	7 m	7 m	5 m
Probe distance from structure	--	--	--
Distance from obstructions	8 m	20 m	50 m
Distance from trees	12 m	--	--
Unrestricted airflow degrees	300°	360°	360°
In climate-controlled shelter?	Y	N	N
Flow-rate verification frequency	Monthly	Monthly	Monthly
Monitor audit frequency	Biannual	Biannual	Biannual
PEP audit monitor?	--	Y	Y
Data submitted to AQS?	Y	Y	Y
Data submitted to AirNOW?	Y	N	N

STN		
Monitor	PM2.5 Speciated	PM2.5 Speciation
CBSA	Phoenix-Mesa-	Phoenix-Mesa-
Site	JLG Supersite	JLG Supersite
Objective	Population	Population
Spatial scale	Neighborhood	Neighborhood
Monitor start date	2/21/2000	2/21/2000
Instrument	Met One Super SASS	URG 3000N
Instrument Start Date	2/21/2000	10/1/2009
Instrument Location	Metal Roof	Metal Roof
Analysis method	Energy Dispersive XRF & Ion Chromatography	IMPROVE A TOR & Various
Method code	811 & 812	831, 838, & Various
Sampling schedule	1 in 3	1 in 3
Sampling duration	24 hour	24 hour
Sampling season	All year	All year
Probe height from ground	5 m	5 m
Probe distance from structure	--	--
Distance from obstructions	8 m	8 m
Distance from trees	5 m	5 m
Unrestricted airflow degrees	210°	210°
In climate-controlled shelter?	N	N
Flow-rate verification frequency	Monthly	Monthly
Monitor audit frequency	Quarterly	Quarterly
Data submitted to AQS?	Y	Y
Data submitted to AirNOW?	N	N

TOXICS - NATTS

Monitor	VOC	VOC	Carbonyl	Carbonyl	Hexavalent Chromium	SVOC	PM10 Metal Speciation
CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite	JLG Supersite
Objective	Population	Population	Population	Population	Population	Population	Population
Spatial scale	Urban	Urban	Urban	Urban	Urban	Urban	Neighborhood
Monitor start date	6/6/2001	6/6/2001	5/15/1999	5/15/1999	1/1/2006	7/8/2007	1/1/2005
Instrument	ATEC 2200 VOC Canister Sampler	ATEC 2200 VOC Canister Sampler	ATEC 8000 Carbonyl Cartridge Sampler	ATEC 8000 Carbonyl Cartridge Sampler	Xontec 924 Toxic Air Sampler	Tisch TE-1000BL PUF	R&P Partisol 2000
Instrument Start Date	5/24/2007	5/24/2007	6/5/2007	6/5/2007	1/1/2006	7/8/2007	1/1/2005
Instrument Location	Shelter	Shelter	Shelter	Shelter	Metal Roof	Shelter	Metal Roof
Analysis method	TO-15	TO-15	TO-11A	TO-11A	CARB Method	TO-13	ICP-MS with Heated Hot Block in Dilute Acid and Hydrogen Peroxide Filter Extraction
Method code	101	101	202	202	920	118	202
Sampling schedule	1 in 6	1 in 6	1 in 6	1 in 6	1 in 6	1 in 6	1 in 6
Sampling duration	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour
Sampling season	All year	All year	All year	All year	All year	All year	All year
Probe height from ground	5 m	5 m	5 m	5 m	5 m	4.5 m	5 m
Probe distance from structure	--	--	--	--	--	--	--
Probe material	Stainless Steel Funnel / Stainless Steel Sample Line	Stainless Steel Funnel / Stainless Steel Sample Line	Stainless Steel Funnel / FEP Teflon Sample Line	Stainless Steel Funnel / FEP Teflon Sample Line	--	Stainless Steel Funnel / Stainless Steel Sample Line	--
Residence time	--	--	--	--	--	--	--
Distance from obstructions	8 m	8 m	8 m	8 m	8 m	8 m	8 m
Distance from trees	5 m	5 m	5 m	5 m	5 m	5 m	5 m
Unrestricted airflow degrees	210°	210°	210°	210°	210°	210°	210°
In climate-controlled shelter?	Y	Y	Y	Y	N	N	N
One-point QC check frequency	Annual	Annual	Annual	Annual	--	Monthly	--
Flow-rate verification frequency	--	--	--	--	--	--	Monthly
Monitor audit frequency	Annual	Annual	Annual	Annual	Biannual	Biannual	Biannual
Data submitted to AQS?	Y	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	N	N	N	N	N	N	N

TOXICS - UATMP	
Monitor	VOC
CBSA	Phoenix-Mesa-Scottsdale
Site	South Phoenix
Objective	Population
Spatial scale	Neighborhood
Monitor start date	8/5/2001
Instrument	ATEC 8001 Canister Sampler
Instrument Start Date	5/20/2010
Instrument Location	Shelter
Analysis method	TO-15
Method code	101
Sampling schedule	1 in 12
Sampling duration	24 hour
Sampling season	All year
Probe height from ground	6 m
Probe distance from structure	2 m
Probe material	Stainless Steel Funnel / Stainless Steel Sample Line
Residence time	--
Distance from obstructions	12 m
Distance from trees	10 m
Unrestricted airflow degrees	250°
In climate-controlled shelter?	Y
One-point QC check frequency	--
Monitor audit frequency	Annual
Data submitted to AQS?	Y
Data submitted to AirNOW?	N

Visibility - Urban Haze - Camera

CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	ADEQ Building	Banner Mesa Medical Center	Estrella Mountain Community College	Estrella Mountain Community College	North Mountain Summit
Objective	Visibility	Visibility	Visibility	Visibility	Visibility
Spatial scale	Urban	Urban	Urban	Urban	Urban
Monitor start date	7/1/2002	1/1/1993	1/1/1993	1/1/1993	1/1/1993
Instrument	Olympus SP500UZ Camera	Olympus SP500UZ Camera	Olympus SP500UZ Camera	Olympus SP500UZ Camera	Olympus SP500UZ Camera
Instrument Start Date	7/1/2003	7/1/2003	7/1/2003	7/1/2003	7/1/2003
Instrument Location	Rooftop	Rooftop	Rooftop	Rooftop	Tower
Analysis method	None	None	None	None	None
Method code	--	--	--	--	--
Sampling schedule	Every 5 min.	Every 5 min.	Every 5 min.	Every 5 min.	Every 5 min.
Sampling duration	< 1 sec	< 1 sec	< 1 sec	< 1 sec	< 1 sec
Sampling season	All year	All year	All year	All year	All year
In climate-controlled shelter?	N	N	N	N	N
Data submitted to AQS?	N	N	N	N	N
Data submitted to AirNOW?	N	N	N	N	N

Visibility - Urban Haze - Nephelometer

CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	Dysart	Estrella	Vehicle Emissions Laboratory
Objective	Population	Population	Population
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitor start date	1/1/2003	1/1/2003	6/25/2003
Instrument	Optec NGN 2 Nephelometer	Optec NGN 2 Nephelometer	Optec NGN 2 Nephelometer
Instrument Start Date	1/1/2003	1/1/2003	6/25/2003
Instrument Location	Tower	Tower	Tower
Analysis method	Light Scatter with correlation to PM2.5	Light Scatter with correlation to PM2.5	Light Scatter with correlation to PM2.5
Method code	--	--	--
Sampling schedule	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly
Sampling season	All year	All year	All year
Probe height from ground	6 m	6 m	5 m
Probe distance from structure	--	--	--
Distance from obstructions	--	--	30 m
Distance from trees	--	5 m	50 m
Unrestricted airflow degrees	360°	360°	360°
In climate-controlled shelter?	N	N	N
Monitor audit frequency	Annual	Annual	Annual
Data submitted to AQS?	N	N	N
Data submitted to AirNOW?	Y	Y	Y

Visibility - Urban Haze - Transmissometer		
CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	Phoenix Transmissometer Receiver	Phoenix Transmissometer Transmitter
Objective	Urban Haze	Urban Haze
Spatial scale	Urban	Urban
Monitor start date	12/1/1992	12/1/1992
Instrument	Optec LVP-2 Transmissometer Receiver	Optec LVP-2 Transmissometer
Instrument Start Date	12/1/1992	12/1/1992
Instrument Location	Rooftop	Rooftop
Analysis method	Light Attenuation	Light Attenuation
Method code	--	--
Sampling schedule	Continuous	Continuous
Sampling duration	5 seconds	5 seconds
Sampling season	All year	All year
Distance from obstructions	--	--
Distance from trees	--	--
Unrestricted airflow degrees	290°	360°
In climate-controlled shelter?	N	N
Data submitted to AQS?	N	N
Data submitted to AirNOW?	N	N

Visibility - Urban Haze - Temp/RH				
CBSA	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale
Site	Dysart	Estrella	Phoenix Transmissometer Receiver	Vehicle Emissions Laboratory
Objective	Population	Population	Urban Haze	Population
Spatial scale	Neighborhood	Neighborhood	Urban	Neighborhood
Monitor start date	7/16/2003	2/11/2003	1/1/1994	5/11/1999
Instrument	Rotronics MP101A Probe	Rotronics MP101A Probe	Rotronics MP101A Probe	Rotronics MP101A Probe
Instrument Start Date	7/16/2003	2/11/2003	6/9/2003	6/30/2003
Instrument Location	Tower	Tower	Rooftop	Tower
Analysis method	None	None	None	None
Method code	--	--	--	--
Sampling schedule	Continuous	Continuous	Continuous	Continuous
Sampling duration	Hourly	Hourly	Hourly	Hourly
Sampling season	All year	All year	All year	All year
Probe height from ground	6 m	6 m	36 m	5 m
Probe distance from structure	1 m	1 m	1 m	1 m
Distance from obstructions	--	--	5 m	30 m
Distance from trees	--	5 m	--	50 m
Unrestricted airflow degrees	360°	360°	360°	360°
In climate-controlled shelter?	N	N	N	N
Monitor audit frequency	Annual	Annual	Annual	Annual
Data submitted to AQS?	N	N	N	N
Data submitted to AirNOW?	N	N	N	N

IMPROVE

CBSA	Sierra Vista-Douglas	Sierra Vista-Douglas	Flagstaff	Flagstaff	None	Flagstaff	Phoenix-Mesa-Scottsdale	Phoenix-Mesa-Scottsdale	Lake Havasu City-Kingman
Site	Chiricahua Entrance Station	Douglas Red Cross	Grand Canyon National Park - Hance Camp	Grand Canyon National Park - Indian Gardens	Greer Water Treatment Plant	Ike's Backbone	JLG Supersite	JLG Supersite	Meadview
Objective	Visibility	Visibility	Visibility	Visibility	Visibility	Visibility	Population	Population	Background
Spatial scale	Regional	Regional	Regional	Regional	Regional	Regional	Neighborhood	Neighborhood	Regional
Monitor start date	3/2/1988	6/2/2004	9/24/1997	10/1/1989	2/29/2000	4/2/2000	4/25/2001	4/25/2001	9/4/1991
Instrument	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE
Instrument Start Date	4/2/2000	6/2/2004	9/24/1997	10/1/1989	2/29/2000	4/2/2000	4/25/2001	4/25/2001	9/4/1991
Instrument Location	Shelter	Platform	Shelter	Shelter	Shelter	Shelter	Metal Roof	Metal Roof	Shelter
Analysis method	Various	Various	Various	Various	Various	Various	Various	Various	Various
Method code	--	--	--	--	--	--	--	--	--
Sampling schedule	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3
Sampling duration	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour
Sampling season	All Year	All Year	All year	All year	All year	All year	All year	All year	All year
Probe height from ground	4 m	3 m	*	4 m	4 m	4 m	5.5 m	5.5 m	*
Probe distance from structure	1 m	--	*	2 m	1 m	1 m	--	--	*
Distance from obstructions	10 m	8 m	*	--	150 m	7 m	8 m	8 m	*
Distance from trees	10 m	6 m	*	6 m	50 m	18 m	5 m	5 m	*
Unrestricted airflow degrees	360°	320°	*	300°	360°	360°	210°	210°	*
Distance between collocated monitors	--	--	--	--	--	--	2 m	2 m	--
In climate-controlled shelter?	N	N	N	N	N	N	N	N	N
Flow-rate verification frequency	--	--	--	--	--	--	Annual	Annual	--
Monitor audit frequency	N	Annual	--	--	Annual	Annual	Annual	Annual	--
Data submitted to AQS?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	N	N	N	N	N	N	N	N	N
Protocol site?	N	Y	N	N	N	N	Y	Y	Y

\* Information not available

IMPROVE - continued

CBSA	Tucson	None	Payson	Phoenix-Mesa- Scottsdale	Tucson	Tucson	Flagstaff	Payson
Site	Organ Pipe National Monument	Petrified Forest National Park	Pleasant Valley Ranger Station	Queen Valley	Saguaro National Park East	Saguaro National Park West	Sycamore Canyon	Tonto National Monument
Objective	Background	Visibility	Visibility	Visibility	Visibility	Visibility	Visibility	Visibility
Spatial scale	Regional	Regional	Regional	Regional	Regional	Regional	Regional	Regional
Monitor start date	1/15/2003	3/2/1988	2/10/2000	4/30/2001	6/4/1988	4/19/2001	9/11/1991	4/23/1988
Instrument	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE	IMPROVE
Instrument Start Date	1/15/2003	3/2/1988	2/10/2000	4/30/2001	6/4/1988	4/19/2001	9/11/1991	4/23/1988
Instrument Location	Shelter	Shelter	Shelter	Rooftop	Shelter	Shelter	Shelter	Shelter
Analysis method	Various	Various	Various	Various	Various	Various	Various	Various
Method code	--	--	--	--	--	--	--	--
Sampling schedule	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3	1 in 3
Sampling duration	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour	24 hour
Sampling season	All year	All year	All year	All year	All year	All year	All year	All year
Probe height from ground	3.6 m	*	4 m	6 m	*	4 m	4 m	5 m
Probe distance from structure	1.5 m	*	1.5 m	1 m	*	1 m	1 m	1.5 m
Distance from obstructions	7.6 m	*	--	73 m	*	--	25 m	--
Distance from trees	12 m	*	10 m	4 m	*	15 m	15 m	6 m
Unrestricted airflow degrees	360°	*	360°	360°	*	360°	360°	360°
Distance between collocated monitors	--	--	--	--	--	--	--	--
In climate-controlled shelter?	N	N	N	N	N	N	N	Y
Flow-rate verification frequency	--	--	--	--	--	--	--	--
Monitor audit frequency	Annual	--	Annual	Annual	--	Annual	Annual	Annual
Data submitted to AQS?	Y	Y	Y	Y	Y	Y	Y	Y
Data submitted to AirNOW?	N	N	N	N	N	N	N	N
Protocol site?	Y	N	N	Y	N	Y	N	N

\* Information not available

## Appendix D – Site Information Data Tables

Note: Some measurements are rounded and/or estimations

This appendix contains detailed information about sites that are fully or partially operated by ADEQ, as well as sites that ADEQ has a strong association with (e.g. IMPROVE sites). All current sites and those closed after July 1, 2011 are included in this appendix. Sites that were closed after July 1, 2011 contain a note indicating so in the site summary section. This appendix also contains general information about the air quality monitors at each site. See Appendix C for more detailed information on specific monitors and networks.

AQS ID	ADEQ ID	SITE NAME	PAGE
	21737	ADEQ Building	94
80-026-1000	16361	Agua Prieta Fire Station	95
04-019-0001	16316	Ajo	96
04-012-8000	34961	Alamo Lake	97
	19489	Banner Mesa Medical Center	98
04-015-1003	16365	Bullhead City	99
04-003-8001	16679	Chiricahua Entrance Station	100
04-003-1005	16503	Douglas Red Cross	101
04-013-4010	19550	Dysart	102
04-013-8005	16506	Estrella	103
	21736	Estrella Mountain Community College	104
04-005-1008	16707	Flagstaff Middle School	105
	16593	Globe Highway	106
04-005-8102	16682	Grand Canyon National Park – Hance Camp	107
04-005-8101	16683	Grand Canyon National Park – Indian Garden	108
04-001-8001	16323	Greer Water Treatment Plant	109
04-007-1001	16326	Hayden Old Jail	110
04-025-8104	16421	Ike’s Backbone	111
04-013-9997	16328	JLG Supersite	112
04-015-9000	21298	Meadview	115
04-007-8000	16629	Miami Golf Course	116
04-007-0009	16382	Miami Ridgeline	117
04-023-0004	16511	Nogales Post Office	118
	16480	North Mountain Summit	120
04-019-0005	16681	Organ Pipe National Monument	121
04-003-0011	16391	Paul Spur Chemical Lime Plant	122
	16392	Paul Spur Chemical Lime Plant South	123
04-007-0008	16317	Payson Well Site	124
04-001-0012	16473	Petrified Forest National Park	125
	16829	Phoenix Transmissometer Receiver	126
	16330	Phoenix Transmissometer Transmitter	127
	16446	Pleasant Valley Ranger Station	128
04-025-8033	133011	Prescott College AQD	129
04-025-2002	18392	Prescott Valley	130

<b>AQS ID</b>	<b>ADEQ ID</b>	<b>SITE NAME</b>	<b>PAGE</b>
04-021-8001	16394	Queen Valley	131
04-019-0020	16499	Rillito	133
04-019-0021	16474	Saguaro National Park East	134
04-019-9000	16475	Saguaro National Park West	135
80-026-8012	113221	San Luis Rio Colorado	136
	142818	Sedona Fire Station AQD	137
04-005-1010	16512	Sedona Post Office	138
04-017-0007	16603	Show Low	139
80-026-0005	16399	Sonora Nogales Fire Station	140
04-013-4003	16377	South Phoenix	141
	135133	Springerville	142
04-005-8103	16476	Sycamore Canyon	143
04-007-0010	16447	Tonto National Monument	144
04-013-9998	16363	Vehicle Emissions Laboratory	145
	138696	Verde Ranger Station	147
04-027-8011	11319	Yuma Supersite	148

## Definitions for Appendix D – Site Information Data Tables

Site Name	<i>Official name for the site as written in ADEQ’s AZURITE / AAAD database</i>
Site propose	<i>Reason for air quality monitoring at the site</i>
Site narrative	<i>Brief summary of the site location and surroundings</i>

### Site Information

AQS ID	<i>Unique identifier from EPA’s Air Quality System database</i>
ADEQ ID	<i>Unique identifier from the AZURITE / AAAD database for each monitoring site</i>
Address	<i>Physical address or cross streets of the monitoring site</i>
County	<i>Arizona county the monitor is located within</i>
CBSA	<i>Core Based Statistical Area that the site is located within. A CBSA is a U.S. geographic area defined by the Office of Management and Budget based around an urban center of at least 10,000 people and adjacent areas that are socioeconomically tied to the urban center by commuting.</i>
Surrounding area	<i>Description of area around monitoring site (residential, commercial, industrial, agricultural, desert, forest, mobile, blighted area, and military reservation)</i>
Distance to road	<i>Distance and direction from the edge of the road to the instrument</i>
Traffic count	<i>ADOT supplied traffic count for the nearest major road (data obtained in 2010)</i>
Groundcover	<i>Type of surface at the base of the instrument (e.g. sand, cement, rooftop, metal, asphalt, etc.)</i>
Latitude	<i>The North/South geographic location of a site in decimal degrees</i>
Longitude	<i>The East/West geographic location of a site in decimal degrees</i>
Elevation	<i>The vertical distance above sea level of the site in meters</i>
Site Established Date	<i>Date site was first used as a monitoring site</i>

### Monitoring Information

Monitor	<i>The pollutant(s) or the atmospheric parameter(s) being monitored at the site</i>
Network	<i>The set of monitors collecting air samples or taking measurements to which this monitor is associated within ADEQs various networks (e.g. SLAMS, NCORE, CSN, PAMS, SPM, NATTS, IMPROVE, or Urban Haze)</i>
Objective	<i>A brief description of the intended purpose of the monitor’s measurements (maximum concentration, population exposure, source-oriented, background, transport, visibility or welfare based)</i>
Spatial scale	<i>Area represented by an air quality monitor (microscale: 0 – 100 m, middle scale: 0.1 – 0.5 km, neighborhood: 0.5 – 4 km, urban: 4 – 50 km, regional: ~50 – 500 km, or national/global)</i>
Monitor start date	<i>Date that a pollutant, parameter, or measurement was started at the site</i>

Instrument	<i>Specific make and model of physical devise that is used to collect air samples or take measurements</i>
Instrument Start Date	<i>The date that the current type of instrument (i.e. method) began operation at the site</i>

**Site Photos**

Aerial View	<i>Image of site and the surrounding area (using Google Earth)</i>
Site View	<i>Most current photo of monitors at the site</i>

### ADEQ Building

Site Purpose: monitor urban haze.

The high-resolution digital camera sits on the northeast corner of the building and points toward Camelback Mountain, which lies 13.4 kilometers to the northeast. The pictures of the local view are updated every 5 minutes and can be viewed on the internet at <http://www.phoenixvis.net/camel/index.html>. The area between the site and Camelback Mountain is primarily residential with some commercial areas.

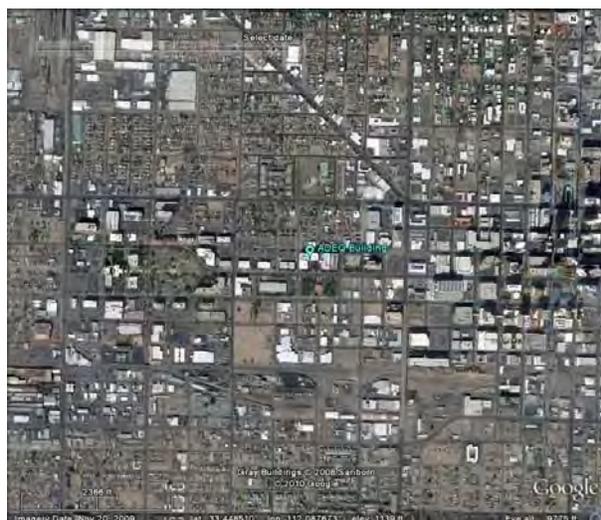
### Site Information

AQS ID	None	ADEQ ID	21737
Address	1110 W. Washington St. Phoenix, AZ 85007		
County	Maricopa	Groundcover	Rooftop
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.4483
Surrounding Area	Residential/Commercial	Longitude	-112.0878
Distance to road	84 m – S	Elevation	329 m
Traffic count	10,852 – Washington St.	Site Established Date	07/01/2002

### Monitoring Information

Monitor	Visibility		
Network	Urban Haze		
Objective	Visibility		
Spatial Scale	Urban		
Monitor Start Date	07/01/2002		
Instrument	Olympus SP500UZ Camera		
Instrument Start Date	07/01/2003		

### Site Photos



Aerial view of ADEQ Building



Camera on rooftop of ADEQ Building – 4/2010

### Agua Prieta Fire Station

Site Purpose: special purpose monitoring.

The site is located approximately 640 meters south of the Arizona/Mexico border. The surrounding area is primarily residential. This site is used as a comparison to the Douglas Red Cross site as part of the border studies. **In the summer of 2011, this site was closed due to funding constraints.**

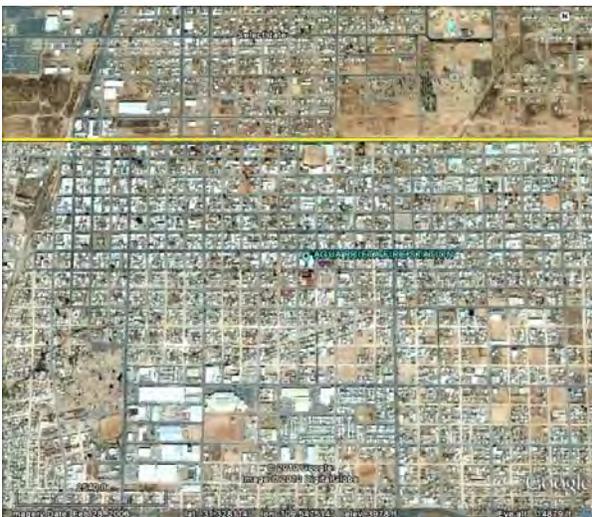
#### Site Information

AQS ID	80-026-1000	ADEQ ID	16361
Address	Calle 6 & Ave. 15 Agua Prieta, Sonora, Mexico		
County	Sonora	Groundcover	Rooftop
CBSA	None	Latitude	31.3283
Surrounding Area	Residential	Longitude	-109.5472
Distance to road	6 m – W	Elevation	1,200 m
Traffic count	n/a	Site Established Date	01/01/1995

#### Monitoring Information

Monitor	PM <sub>10</sub>	PM <sub>2.5</sub>	Wind	Temp/RH
Network	Non-regulatory SPM	Non-regulatory SPM	Non-regulatory SPM	Non-regulatory SPM
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	01/01/1995	04/11/2010	12/18/1998	12/18/1998
Instrument	Partisol 2000	Partisol 2000	RM Young 5103	Vaisala HMP 45C
Instrument Start Date	04/11/2010	04/11/2010	12/18/1998	12/18/1998

#### Site Photos



Aerial view of Agua Prieta Fire Station



Roof of Agua Prieta Fire Station – 12/2004

## Ajo

Site Purpose: NAAQS compliance network.

The site is located at the Pima County Maintenance Yard, with the wind system mounted to the north of the instruments. The closest structure to the site is an east-west oriented ADOT office/trailer to the south. To the east lies the stabilized tailings pile associated with the Ajo mining operation which closed in 1985.

### Site Information

AQS ID	04-019-0001	ADEQ ID	16316
Address	1211 Well Rd. Ajo, AZ 85321		
County	Pima	Groundcover	Gravel
CBSA	Tucson	Latitude	32.3820
Surrounding Area	Residential/Commercial	Longitude	-112.8575
Distance to road	109 m – E	Elevation	515 m
Traffic count	500 – Ajo Well Rd. 1	Site Established Date	07/01/1969

### Monitoring Information

Monitor	PM <sub>10</sub>	Wind	
Network	SLAMS	MET	
Objective	Population	Population	
Spatial Scale	Neighborhood	Neighborhood	
Monitor Start Date	02/11/1991	07/01/1969	
Instrument	R&P 1400AB TEOM	RM Young 5103 Anemometer	
Instrument Start Date	02/19/2009	06/11/2003	

### Site Photos



Aerial view of Ajo



Ajo fenced area and meteorological tower –  
03/2009

## Alamo Lake

Site Purpose: NAAQS compliance network and AQI forecasting.

The site was established to replace the Hillside site and is located in Alamo Lake State Park, which is approximately 49 km north of Wenden, AZ. The surrounding area consists of mostly desert, with a lake about 1 km to the northeast. A small water pump/storage tank (1,000 gallon) lies 7 meters to the east of the shelter.

### Site Information

AQS ID	04-012-8000	ADEQ ID	34961
Address	Alamo Lake State Park		
County	La Paz	Groundcover	Gravel
CBSA	None	Latitude	34.2439
Surrounding Area	Desert	Longitude	-113.5586
Distance to road	30 m – E	Elevation	403 m
Traffic count	230 – Alamo Rd.	Site Established Date	05/20/2005

### Monitoring Information

Monitor	O <sub>3</sub>		
Network	SLAMS		
Objective	Transport		
Spatial Scale	Regional		
Monitor Start Date	05/20/2005		
Instrument	Teledyne API 400E O3 Analyzer		
Instrument Start Date	03/10/2011		

### Site Photos



Regional view of Alamo Lake



Alamo Lake shelter with water tanks to the east – 09/2008

**Banner Mesa Medical Center**

Site Purpose: monitor urban haze.

The high-resolution digital camera points to the Superstition Mountains, which lie 32 km east of the site. The pictures of the local views are updated every 5 minutes and can be viewed on the internet at <http://www.phoenixvis.net/supm1/index.html>. The area between the site and the mountains is primarily residential, with some commercial areas.

**Site Information**

AQS ID	None	ADEQ ID	19489
Address	525 W. Brown Rd. Mesa, AZ 85201		
County	Maricopa	Groundcover	Rooftop
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.4335
Surrounding Area	Residential	Longitude	-111.8428
Distance to road	20 m – N	Elevation	454 m
Traffic count	32,760 – Country Club Dr.	Site Established Date	01/01/1993

**Monitoring Information**

Monitor	Visibility			
Network	Urban Haze			
Objective	Visibility			
Spatial Scale	Urban			
Monitor Start Date	01/01/1993			
Instrument	Olympus SP500UZ Camera			
Instrument Start Date	07/01/2003			

**Site Photos**



Aerial view of Banner Mesa Medical Center

No Photo

## Bullhead City

Site Purpose: NAAQS compliance network.

The site is located on the rooftop of the U.S. Post Office Building, northeast of SR 95 and 7<sup>th</sup> Street. The surrounding area is commercial and residential to the west and south. The Colorado River lies to the west less than 400 meters. To the northeast/east, about 575 meters, is the Bullhead City Airport.

### Site Information

AQS ID	04-015-1003	ADEQ ID	16365
Address	990 Highway 95 Bullhead City, AZ 86429		
County	Mohave	Groundcover	Rooftop
CBSA	Lake Havasu City-Kingman	Latitude	35.1539
Surrounding Area	Commercial/Residential	Longitude	-114.5661
Distance to road	~30 m – W	Elevation	156 m
Traffic count	32,575 – SR 95	Site Established Date	11/01/1997

### Monitoring Information

Monitor	PM <sub>10</sub>			
Network	SLAMS			
Objective	Population			
Spatial Scale	Neighborhood			
Monitor Start Date	11/05/1997			
Instrument	R&P Partisol 2000			
Instrument Start Date	09/02/2003			

### Site Photos



Aerial view of Bullhead City



Roof of Bullhead City Post Office looking north – 04/2012

### Chiricahua Entrance Station

Site Purpose: monitor regional haze and IMPROVE program.

The site is operated by the NPS. The surrounding area is wilderness and desert. The Chiricahua National Monument lies 3.8 km to the northeast.

#### Site Information

AQS ID	04-003-8001	ADEQ ID	16679
Address	13063 E. Bonita Canyon Rd. Wilcox, AZ 85643		
County	Cochise	Groundcover	Dirt/Rocks
CBSA	Sierra Vista-Douglas	Latitude	32.0094
Surrounding Area	Desert	Longitude	-109.3891
Distance to road	99 m – E	Elevation	1,570 m
Traffic count	216 – Bonita Canyon Rd.	Site Established Date	01/01/1988

#### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Visibility		
Spatial Scale	Regional		
Monitor Start Date	03/02/1988		
Instrument	IMPROVE		
Instrument Start Date	04/02/2000		

#### Site Photos



Regional view of Chiricahua Entrance Station



Chiricahua Entrance Station shelter and IMPROVE – 07/2008

### Douglas Red Cross

Site Purpose: NAAQS compliance network.

The site is located at the Red Cross building on the south side of 15<sup>th</sup> Street. The surrounding area is a mix of residential and commercial land use. The site is about 1,685 meters from the Arizona/Mexico border. Due to an oversight when loading IMPROVE data to the AQS database, a second AQS ID was created (04-003-9000) for IMPROVE data. This is an IMPROVE protocol site.

#### Site Information

AQS ID	04-003-1005	ADEQ ID	16503
Address	1445 E. 15 <sup>th</sup> St. Douglas, AZ 85607		
County	Cochise	Groundcover	Dirt/Grass
CBSA	Sierra Vista-Douglas	Latitude	31.3492
Surrounding Area	Commercial/Residential	Longitude	-109.5396
Distance to road	30 m – N	Elevation	1,231 m
Traffic count	2,320 – 14 <sup>th</sup> St.	Site Established Date	09/01/1998

#### Monitoring Information

Monitor	PM <sub>10</sub>	PM <sub>2.5</sub>	Aerosol	
Network	SLAMS	SLAMS	IMPROVE	
Objective	Population	Population	Visibility	
Spatial Scale	Neighborhood	Neighborhood	Regional	
Monitor Start Date	09/02/1998	11/02/2000	06/02/2004	
Instrument	R&P Partisol 2000	R&P Partisol 2000	IMPROVE	
Instrument Start Date	04/01/2004	04/01/2004	06/02/2004	

#### Site Photos



Aerial view of Douglas Red Cross



Douglas Red Cross fenced site – 01/2012

### Dysart

Site Purpose: monitor urban haze and AQI forecasting.

The site is located in the Maricopa County Facility Maintenance Yard at the corner of Bell Road and Dysart Road and is shared with MCAQD. The surrounding area is commercial and residential.

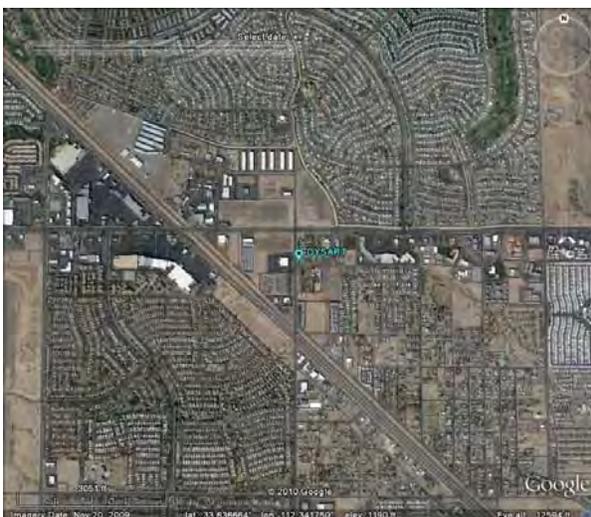
#### Site Information

AQS ID	04-013-4010	ADEQ ID	19550
Address	16825 N. Dysart Rd. Surprise, AZ 85374		
County	Maricopa	Groundcover	Gravel
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.6370
Surrounding Area	Commercial/Residential	Longitude	-112.3393
Distance to road	14 m – W	Elevation	357 m
Traffic count	51,673 – Bell Rd.	Site Established Date	01/01/2003

#### Monitoring Information

Monitor	Bscat/PM <sub>2.5</sub>	Temp/RH	
Network	Urban Haze	Urban Haze	
Objective	Population	Population	
Spatial Scale	Neighborhood	Neighborhood	
Monitor Start Date	01/01/2003	07/16/2003	
Instrument	Optec NGN 2 Nephelometer	Rotronics MP101A Probe	
Instrument Start Date	01/01/2003	07/16/2003	

#### Site Photos



Aerial view of Dysart



Dysart ADEQ Nephelometer tower attached to county shelter – 02/2008

## Estrella

Site Purpose: monitor urban haze and AQI forecasting.

The site is located in the southeast corner of the Maricopa County Maintenance Yard at Estrella Park. The surrounding area consist of the Estrella Mountains to the east, south, and west; a golf course 256 meters to the west; and a mixture of open land, agricultural lands, residential, and commercial activity to the north.

### Site Information

AQS ID	04-013-8005	ADEQ ID	16506
Address	15099 W. Casey Abbott Rd. Goodyear, AZ 85338		
County	Maricopa	Groundcover	Grass/Gravel
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.3833
Surrounding Area	Desert/Recreation Area	Longitude	-112.3728
Distance to road	258 m – N	Elevation	277 m
Traffic count	910 – W. Vineyard Ave.	Site Established Date	01/01/1995

### Monitoring Information

Monitor	Bscat/PM <sub>2.5</sub>	Temp/RH	
Network	Urban Haze	Urban Haze	
Objective	Population	Population	
Spatial Scale	Neighborhood	Neighborhood	
Monitor Start Date	01/01/2003	02/11/2003	
Instrument	Optec NGN 2 Nephelometer	Rotronics MP101A Probe	
Instrument Start Date	01/01/2003	02/11/2003	

### Site Photos



Aerial view of Estrella



Estrella Nephelometer tower – 02/2008

## Estrella Mountain Community College

Site Purpose: monitor urban haze.

One high-resolution digital camera points to the Estrella Mountains, which lies 11 km to the southwest, and the other camera points to the White Tanks mountain range which is 20 km to the northeast. The pictures of the local views are updated every 5 minutes and can be viewed on the internet at <http://www.phoenixvis.net/esmo1/index.html>. The area between the site and the mountain ranges is a mixture of residential, commercial, and agricultural uses.

### Site Information

AQS ID	None	ADEQ ID	21736
Address	3000 N. Dysart Rd. Avondale, AZ 85323		
County	Maricopa	Groundcover	Rooftop
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.4836
Surrounding Area	Residential	Longitude	-112.3503
Distance to road	155 m – S	Elevation	305 m
Traffic count	7,280 – Thomas Rd.	Site Established Date	01/01/1993

### Monitoring Information

Monitor	Visibility			
Network	Urban Haze			
Objective	Visibility			
Spatial Scale	Urban			
Monitor Start Date	01/01/1993			
Instrument	Olympus SP500UZ Camera			
Instrument Start Date	07/01/2003			

### Site Photos



Aerial view of Estrella Mountain  
Community College

No photo

### Flagstaff Middle School

Site Purpose: NAAQS compliance network and monitor smoke/public information.

The site is west of Bonito Road on the rooftop of a Flagstaff Middle School building. The surrounding area is generally residential, with Thorpe Park located about 800 meters to the west, and US Route 180 approximately 415 meters to the east.

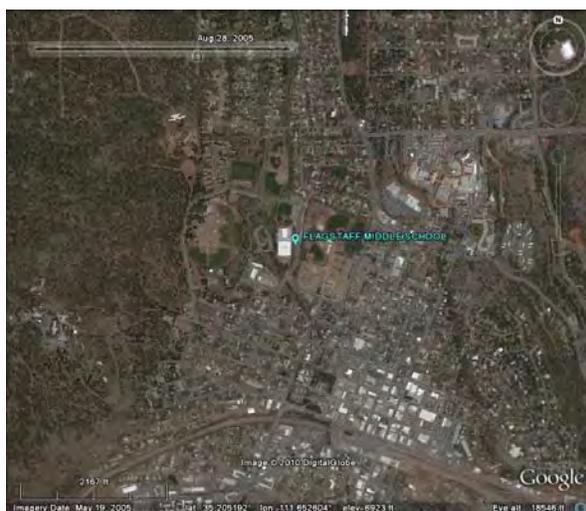
#### Site Information

AQS ID	04-005-1008	ADEQ ID	16707
Address	755 N. Bonito St. Flagstaff, AZ 86001		
County	Coconino	Groundcover	Rooftop
CBSA	Flagstaff	Latitude	35.2061
Surrounding Area	Residential	Longitude	-111.6528
Distance to road	70 m – E	Elevation	2,120 m
Traffic count	3,200 – N. Bonito St.	Site Established Date	10/29/1996

#### Monitoring Information

Monitor	O <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>2.5</sub>
Network	SLAMS	SLAMS	SLAMS	Non-regulatory SPM
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	03/13/2008	10/30/1996	08/27/2001	08/27/2001
Instrument	Teledyne API 400E O <sub>3</sub> Analyzer	R&P Partisol 2000	R&P Partisol 2000	Met One E-BAM
Instrument Start Date	03/11/2011	04/01/2004	09/16/2003	07/14/2011

#### Site Photos



Aerial view of Flagstaff Middle School



Particulate monitors on roof of Flagstaff Middle School – 04/2008

### Globe Highway

Site Purpose: NAAQS compliance network and a source permit requirement.

This site is the location of the collocated TSP Pb monitors in Hayden, AZ. ASARCO mine also maintains a sulfur dioxide analyzer at the site. The site is located on the southwest end of a small canyon and is located approximately 1 km to the east/southeast of the ASARCO smelting facility. Due to its proximity to the end of the canyon, the site may be influenced by both broad and local meteorological conditions.

#### Site Information

AQS ID	None	ADEQ ID	16593
Address	SR 77 Winkelman, AZ 85292		
County	Gila	Groundcover	Gravel
CBSA	Payson	Latitude	33.002
Surrounding Area	Desert/Residential	Longitude	-110.765
Distance to road	5 m – W	Elevation	602 m
Traffic count	n/a	Site Established Date	01/01/1975

#### Monitoring Information

Monitor	Pb	Wind	Temp/RH	
Network	SLAMS	MET	MET	
Objective	Source	Population	Population	
Spatial Scale	Middle	Middle	Middle	
Monitor Start Date	10/01/2010	04/15/2011	04/15/2011	
Instrument	Tisch TE-8550-BL TSP	RM Young 5103 Anemometer	Vaisala HMP155 Probe	
Instrument Start Date	10/01/2010	04/15/2011	04/15/2011	

#### Site Photos



Aerial view of Globe Highway



Shelter, towers, and TSP monitors at Globe Highway – 5/10/2011

### Grand Canyon National Park - Hance Camp

Site Purpose: monitor regional haze and IMPROVE program.

The site is operated by the NPS. The site is 183 meters south of East Rim Drive and 1,931 meters south of Grandview Point turnoff. The site is in a clearing surrounded by forest.

#### Site Information

AQS ID	04-005-8102	ADEQ ID	16682
Address	West of SR 64 - Grand Canyon, AZ 86023		
County	Coconino	Groundcover	Dirt
CBSA	Flagstaff	Latitude	35.9731
Surrounding Area	Desert	Longitude	-111.9841
Distance to road	200 m – E	Elevation	2,235 m
Traffic count	6,579 – SR 64	Site Established Date	09/24/1997

#### Monitoring Information

Monitor	Aerosol			
Network	IMPROVE			
Objective	Visibility			
Spatial Scale	Regional			
Monitor Start Date	09/24/1997			
Instrument	IMPROVE			
Instrument Start Date	09/24/1997			

#### Site Photos



Regional view of Grand Canyon NP - Hance Camp



Grand Canyon NP - Hance Camp shelter – date unknown

## Grand Canyon National Park - Indian Gardens

Site Purpose: monitor regional haze and IMPROVE program.

The site is owned by the NPS. The site is located in the Indian Gardens picnic area in the Grand Canyon, near the ranger station on the south side of the canyon along the Bright Angel Trail.

### Site Information

AQS ID	04-005-8101	ADEQ ID	16683
Address	Bright Angel Trail Grand Canyon, AZ 86023		
County	Coconino	Groundcover	Dirt/Rocks
CBSA	Flagstaff	Latitude	36.0778
Surrounding Area	Desert	Longitude	-112.1289
Distance to road	8,047 m – S	Elevation	1,183 m
Traffic count	1,250 – Entrance Road	Site Established Date	10/01/1989

### Monitoring Information

Monitor	Aerosol			
Network	IMPROVE			
Objective	Visibility			
Spatial Scale	Regional			
Monitor Start Date	10/01/1989			
Instrument	IMPROVE			
Instrument Start Date	10/01/1989			

### Site Photos



Regional view of Grand Canyon NP - Indian Gardens



Grand Canyon NP - Indian Gardens  
IMPROVE monitor – 04/2008

### Greer Water Treatment Plant

Site Purpose: monitor regional haze and IMPROVE program.

The site is located in the Apache National Forest and is operated the USFS. The surrounding area is forest with the town of Greer approximately 4 km to the south/southwest.

#### Site Information

AQS ID	04-001-8001	ADEQ ID	16323
Address	SR 260 & SR 373 Greer, AZ 85927		
County	Apache	Groundcover	Grass
CBSA	None	Latitude	34.0583
Surrounding Area	Forest	Longitude	-109.4400
Distance to road	1,600 m – N	Elevation	2,503 m
Traffic count	1,044 – SR 373	Site Established Date	01/01/2000

#### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Visibility		
Spatial Scale	Regional		
Monitor Start Date	02/29/2000		
Instrument	IMPROVE		
Instrument Start Date	02/29/2000		

#### Site Photos



Aerial view of Greer Water Treatment Plant



Shelter at Greer Water Treatment Plant –  
09/2008

### Hayden Old Jail

Site Purpose: NAAQS compliance network and a source permit requirement.

The site is located in a shelter next to the old Hayden Jail building near the center of town. The instruments were previously located in the jail building and were moved due to safety and siting concerns in 2010. The surrounding area consists mainly of residential and commercial. The site is located approximately 1 km to the west of the ASARCO smelting facility. ASARCO mine also maintains a sulfur dioxide analyzer at the site in the old jail building.

### Site Information

AQS ID	04-007-1001	ADEQ ID	16326
Address	Canyon Dr. & Kenecott Ave. Hayden, AZ 85235		
County	Gila	Groundcover	Shelter
CBSA	Payson	Latitude	33.0062
Surrounding Area	Residential	Longitude	-110.7864
Distance to road	5 m – E	Elevation	625 m
Traffic count	1,790 – Velasco Ave.	Site Established Date	01/01/1969

### Monitoring Information

Monitor	SO <sub>2</sub>	PM <sub>10</sub>	Wind	Temp/RH
Network	SLAMS	SLAMS	MET	MET
Objective	Source	Source	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	01/01/1975	01/06/1981	02/02/2011	02/02/2011
Instrument	Thermo 43C SO <sub>2</sub> Analyzer	R&P 1400 AB TEOM	RM Young 5103 Anemometer	Vaisala HMP45C Probe
Instrument Start Date	10/10/2001	03/03/2009	02/02/2011	02/02/2011

### Site Photos



Aerial view of Hayden Old Jail



Hayden Old Jail – 05/2011

### Ike's Backbone

Site Purpose: monitor regional haze and IMPROVE program.

The site is operated by the USFS. The surrounding area is Tonto National Forest, which includes Mazatzal and Pine Mountain Wilderness areas. The site is located on a small ridge with the Verde River and mountains nearby.

### Site Information

AQS ID	04-025-8104	ADEQ ID	16421
Address	Fossil Creek Rd. and Childs Rd. Strawberry, AZ 85544		
County	Coconino	Groundcover	Rocks/Plants
CBSA	Flagstaff	Latitude	34.3406
Surrounding Area	Forest	Longitude	-111.6825
Distance to road	n/a	Elevation	1,303 m
Traffic count	475 – Fossil Creek Rd.	Site Established Date	04/02/2000

### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Visibility		
Spatial Scale	Regional		
Monitor Start Date	04/02/2000		
Instrument	IMPROVE		
Instrument Start Date	04/02/2000		

### Site Photos



Regional view of Ike's Backbone



IMPROVE at Ike's Backbone – 2011

### JLG Supersite

**Site Purpose:** NAAQS compliance network, NCore, PAMS, NATTS, STN, AQI forecasting, monitor urban haze, and meteorological support.

The site was established to represent air quality in the central core of the Phoenix metropolitan area. The surrounding area is primarily residential neighborhoods, with I-17 approximately 1.6 km to the west. This is also an IMPROVE protocol site.

#### Site Information

AQS ID	04-013-9997	ADEQ ID	16328
Address	4530 N. 17 <sup>th</sup> Ave. Phoenix, AZ 85015		
County	Maricopa	Groundcover	Gravel
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.5038
Surrounding Area	Residential	Longitude	-112.0957
Distance to road	8.5 m – E	Elevation	354 m
Traffic count	20,214 – Campbell Ave.	Site Established Date	07/01/1993

#### Monitoring Information

Monitor	CO	NO <sub>y</sub>	NO <sub>2</sub> /NO <sub>x</sub>	O <sub>3</sub>
Network	SLAMS/ NCore/PAMS	NCore	SLAMS/PAMS	SLAMS/ NCore/PAMS
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood/ Urban
Monitor Start Date	07/01/1993	01/01/2011	07/01/1993	07/01/1993
Instrument	Ecotech EC 9830 CO Analyzer	Ecotech 9843 Reactive NO <sub>x</sub>	Thermo 42C NO <sub>x</sub> Analyzer	Teledyne API 400E O <sub>3</sub> Analyzer
Instrument Start Date	12/15/2011	04/01/2011	07/01/1993	04/01/2011

#### Monitoring Information

Monitor	SO <sub>2</sub>	VOC	VOC	Carbonyls
Network	SLAMS/NCore	PAMS/ TOXICS - NATTS	TOXICS - NATTS	PAMS/ TOXICS - NATTS
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Urban	Urban	Urban
Monitor Start Date	03/03/2005	01/01/2003	6/6/2001	05/15/1999
Instrument	Ecotech EC-9850 SO <sub>2</sub> Analyzer	ATEC 8001 Canister Sampler	ATEC 2200 VOC Canister Sampler	ATEC 8000 Carbonyl Cartridge Sampler
Instrument Start Date	06/01/2010	06/02/2011	5/24/2007	06/05/2007

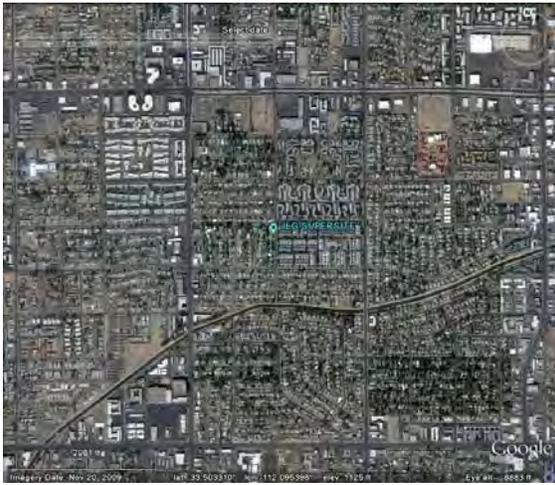
<b>Monitoring Information</b>				
Monitor	Hexavalent Chromium	SVOC	Pb PM <sub>10</sub>	PM <sub>10-2.5</sub>
Network	TOXIC - NATTS	TOXICS - NATTS	SLAMS/NCore	NCore
Objective	Population	Population	Population	Population
Spatial Scale	Urban	Urban	Neighborhood	Neighborhood
Monitor Start Date	01/01/2006	07/08/2007	01/01/2005	11/10/2010
Instrument	Xontec 924 Toxic Air Sampler	Tisch TE-1000BL PUF	R&P Partisol 2000	Paired Met One 1020 BAMs
Instrument Start Date	01/01/2006	07/08/2007	01/01/2005	11/10/2010

<b>Monitoring Information</b>				
Monitor	PM <sub>10</sub>	PM <sub>10</sub> /Metal Speciation	PM <sub>2.5</sub>	PM <sub>2.5</sub>
Network	SLAMS	TOXICS - NATTS	SLAMS/NCore	SLAMS/NCore
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	07/01/1993	01/01/2005	07/01/2003	07/01/2003
Instrument	Met One 1020 BAM	R&P Partisol 2000	R&P Partisol 2000	Met One 1020 BAM
Instrument Start Date	11/10/2010	01/01/2005	07/01/2011	11/10/2010

<b>Monitoring Information</b>				
Monitor	PM <sub>2.5</sub> Speciated	PM <sub>2.5</sub> Speciated	Wind	Temp/RH
Network	NCore/STN	NCore/STN	Met/NCore	Met/NCore
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	02/21/2000	02/21/2000	07/01/1993	07/01/1993
Instrument	Met One Super SASS	URG 3000N	RM Young 5103 Anemometer	Rotronics MP101A Probe
Instrument Start Date	02/21/2000	10/01/2009	07/01/1993	01/15/2010

<b>Monitoring Information</b>				
Monitor	Aerosol			
Network	IMPROVE			
Objective	Population			
Spatial Scale	Neighborhood			
Monitor Start Date	04/25/2001			
Instrument	IMPROVE			
Instrument Start Date	04/25/2001			

**Site Photos**



Aerial view of JLG Supersite



Eastern side of JLG Supersite – 09/2008

### Meadview

Site Purpose: monitor regional haze and IMPROVE program.

The site is located within the Lake Mead National Recreation Area on the north end of Meadview, AZ, where the Grand Canyon meets Lake Mead. The surrounding area is primarily desert. To the southwest 64.4 km is US 93, which is the closest highway to the site and about 96.5 km to the southeast is downtown Kingman. This is an IMPROVE protocol site.

### Site Information

AQS ID	04-015-9000	ADEQ ID	21298
Address	Pierce Ferry Rd. Meadview, AZ 86444		
County	Mohave	Groundcover	Gravel
CBSA	Lake Havasu City-Kingman	Latitude	36.0193
Surrounding Area	Desert/Residential	Longitude	-114.0684
Distance to road	100 m – E	Elevation	902 m
Traffic count	0 – Pierce Ferry Rd.	Site Established Date	09/04/1991

### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Background		
Spatial Scale	Regional		
Monitor Start Date	09/04/1991		
Instrument	IMPROVE		
Instrument Start Date	09/04/1991		

### Site Photos



Regional view of Meadview



Photo of Meadview taken from IMPROVE website – date unknown

### Miami Golf Course

Site Purpose: NAAQS compliance network and a source permit requirement.

This site is the location of the TSP-Pb monitor in Miami, AZ. Freeport McMoRan also maintains two particulate matter monitors at the site. The site is located near the Cobre Valley Country Club with residential areas to the south and east and the Freeport McMoRan facility approximately 2 km to the west/southwest.

#### Site Information

AQS ID	04-007-8000	ADEQ ID	16629
Address	SR 188 and US 60 Miami, AZ 85539		
County	Gila	Groundcover	Gravel
CBSA	Payson	Latitude	33.4190
Surrounding Area	Residential	Longitude	-110.8296
Distance to road	230 – E	Elevation	1000 m
Traffic count	n/a	Site Established Date	01/01/1997

#### Monitoring Information

Monitor	Pb	Wind	Temp/RH
Network	SLAMS	MET	MET
Objective	Source	Population	Population
Spatial Scale	Middle	Middle	Middle
Monitor Start Date	10/01/2010	06/08/2011	06/08/2011
Instrument	Tisch TE-8550- BL TSP	RM Young 5305 Anemometer	Vaisala HMP 155 Probe
Instrument Start Date	10/01/2010	06/08/2011	06/08/2011

#### Site Photos



Aerial view of Miami Golf Course



Fenced Miami Golf Course site – 05/2011

### Miami Ridgeline

Site Purpose: NAAQS compliance network and a source permit requirement.

The site is located inside the fence line on private property off of Linden Road and sits on the side of a north-south oriented ridge, which slopes in a northerly direction toward the town of Miami. The surrounding area is desert. Freeport McMoRan Copper and Gold Inc. also maintains a PM<sub>10</sub> monitor at the site. The Freeport McMoRan smelter is 1.6 km to the north of the site.

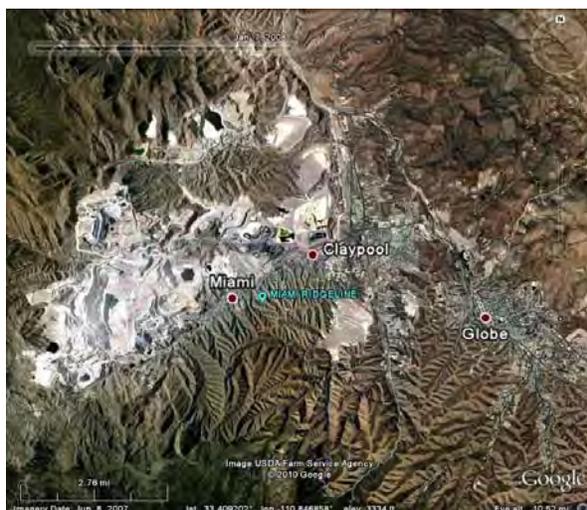
### Site Information

AQS ID	04-007-0009	ADEQ ID	16382
Address	4030 Linden St. Miami, AZ 85539		
County	Gila	Groundcover	Dirt
CBSA	Payson	Latitude	33.3992
Surrounding Area	Residential	Longitude	-110.8589
Distance to road	40 m – N	Elevation	1,085 m
Traffic count	510 – Loomis Ave.	Site Established Date	0/01/1993

### Monitoring Information

Monitor	SO <sub>2</sub>			
Network	SLAMS			
Objective	Source			
Spatial Scale	Neighborhood			
Monitor Start Date	10/05/1995			
Instrument	Thermo 43C SO2 Analyzer			
Instrument Start Date	7/21/1999			

### Site Photos



Aerial view of Miami Ridgeline



Fenced Miami Ridgeline site – 04/2008

**Nogales Post Office**

Site Purpose: NAAQS compliance network.

The site is located on the rooftop of the U.S. Post Office building, which lies approximately 670 meters north from the Arizona/Mexico Border. The surrounding area is a mixture of commercial and residential land use. This site is used to meet the PM<sub>2.5</sub> collocation requirement.

**Site Information**

AQS ID	04-023-0004	ADEQ ID	16511
Address	300 N. Morley Ave. Nogales, AZ 85621		
County	Santa Cruz	Groundcover	Rooftop
CBSA	Nogales	Latitude	31.3372
Surrounding Area	Residential/Commercial	Longitude	-110.9367
Distance to road	14 m – NW	Elevation	1,176 m
Traffic count	7,199 – Morley Ave.	Site Established Date	01/01/1980

**Monitoring Information**

Monitor	PM <sub>10</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>2.5</sub>
Network	SLAMS	NAAQS-SPM	SLAMS	Non-regulatory SPM
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	01/01/1980	01/01/1980	04/01/1999	04/01/1999
Instrument	Thermo Partisol 2000	Met One 1020 BAM	R&P Partisol 2000	Met One 1020 BAM
Instrument Start Date	08/27/2003	02/02/2004	09/26/2003	02/02/2004

**Monitoring Information**

Monitor	Wind	Temp/RH		
Network	MET	MET		
Objective	Population	Population		
Spatial Scale	Neighborhood	Neighborhood		
Monitor Start Date	01/01/1980	08/11/2011		
Instrument	RM Young 5103 Anemometer	Vaisala HMP45C Probe		
Instrument Start Date	06/13/2003	08/11/2011		

## Site Photos



Aerial view of Nogales Post Office



Particulate and meteorological monitors on roof of Nogales Post Office – 02/2012

### North Mountain Summit

Site Purpose: monitor urban haze.

The site is located on a mountain top in the North Mountain Recreation Area of Phoenix. The high-resolution digital camera points toward South Mountain, which lies 27 km to the south. The pictures of the local views are updated every 5 minutes and can be viewed on the internet at <http://www.phoenixvis.net/somt1/index.html>. The surrounding area is desert recreation area to the north and west and residential with some commercial activity to the south and east.

#### Site Information

AQS ID	None	ADEQ ID	16480
Address	west side of 7 <sup>th</sup> St. in North Mountain Recreation Area Phoenix, AZ		
County	Maricopa	Groundcover	Dirt/Desert
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.5855
Surrounding Area	Residential/Desert	Longitude	-112.0722
Distance to road	850 m – E	Elevation	625 m
Traffic count	28,210 – 7 <sup>th</sup> St.	Site Established Date	01/01/1993

#### Monitoring Information

Monitor	Visibility			
Network	Urban Haze			
Objective	Visibility			
Spatial Scale	Urban			
Monitor Start Date	01/01/1993			
Instrument	Olympus SP500UZ Camera			
Instrument Start Date	07/01/2003			

#### Site Photos



Aerial view of North Mountain Summit



Camera located on tower at North Mountain Summit – 2008

## Organ Pipe National Monument

**Site Purpose:** monitor regional haze and IMPROVE program.

The site is owned by the NPS, who operates the monitor at the site. The site is located 1 km south/southwest of the national monument visitor center, which is about 35.4 km south of Why, AZ. The site is about seven meters from a water pump house and lies about 540 meters east of a small mountain range. The surrounding area is predominately desert. This is an IMPROVE protocol site.

### Site Information

AQS ID	04-019-0005	ADEQ ID	16681
Address	SR 85 & Puerto Blanco Rd. Ajo, AZ 85321		
County	Pima	Groundcover	Gravel
CBSA	Tucson	Latitude	31.9499
Surrounding Area	Desert	Longitude	-112.8010
Distance to road	400 m – E	Elevation	505 m
Traffic count	1,525 – SR 85	Site Established Date	01/01/1971

### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Background		
Spatial Scale	Regional		
Monitor Start Date	01/15/2003		
Instrument	IMPROVE		
Instrument Start Date	01/15/2003		

### Site Photos



Regional view of Organ Pipe NM



Shelter at Organ Pipe NM – 03/2008

## Paul Spur Chemical Lime Plant

Site Purpose: NAAQS compliance network.

The site is located approximately 1 km to the northeast of the Chemical Lime Plant, just south of SR 80 between Bisbee and Douglas, and 3.5 km north of the Arizona/Mexico border. In 2011 the meteorological instruments were re-located to this site when the Paul Spur Chemical Lime Plant South site was closed. The collocated PM<sub>10</sub> instrument was removed and replaced with a TEOM instrument to aid in the migration of this site to continuous monitoring. Other than the nearby Chemical Lime Plant, the surrounding area is predominately desert.

### Site Information

AQS ID	04-003-0011	ADEQ ID	16391
Address	SR 80 & Paul Spur Rd. Paul Spur, AZ 85603		
County	Cochise	Groundcover	Dirt
CBSA	Sierra Vista-Douglas	Latitude	31.3658
Surrounding Area	Desert	Longitude	-109.7309
Distance to road	50 m – S	Elevation	1,278 m
Traffic count	4,920 – SR 80	Site Established Date	01/01/1985

### Monitoring Information

Monitor	PM <sub>10</sub>	PM <sub>10</sub>	Wind	Temp/RH
Network	SLAMS	SLAMS	MET	MET
Objective	Source	Source	Source	Source
Spatial Scale	Middle	Middle	Middle	Middle
Monitor Start Date	01/06/1991	01/06/1991	12/01/2011	12/01/2011
Instrument	Thermo Partisol 2000	R&P 1400 AB TEOM	RM Young 5305 Anemometer	Vaisala HMP155 Probe
Instrument Start Date	12/16/1997	01/12/2012	12/01/2011	12/01/2011

### Site Photos



Aerial view of Paul Spur CLP



Particulate monitors and meteorological tower at Paul Spur CLP – 01/2012

### Paul Spur Chemical Lime Plant South

Site Purpose: meteorological support.

The site is located approximately 500 meters to the south/southeast of the Chemical Lime Plant, south of SR 80 between Bisbee and Douglas, and 3.5 km north of the Arizona/Mexico border. The surrounding area is predominately desert. **In December, 2011 this site was closed** and meteorological instruments were added to the Paul Spur Chemical Lime Plant site, which is located approximately 1 km to the north/northeast.

#### Site Information

AQS ID	None	ADEQ ID	16392
Address	South of Stonridge Rd. Paul Spur, AZ 85603		
County	Cochise	Groundcover	Dirt/Grass
CBSA	Sierra Vista-Douglas	Latitude	31.3543
Surrounding Area	Desert	Longitude	-109.7376
Distance to road	20 m – N	Elevation	1,287 m
Traffic count	4,920 – SR 80	Site Established Date	12/21/1995

#### Monitoring Information

Monitor	Wind			
Network	MET			
Objective	Middle			
Spatial Scale	Neighborhood			
Monitor Start Date	12/21/1995			
Instrument	RM Young5103 Anemometer			
Instrument Start Date	12/16/1997			

#### Site Photos



Aerial view of Paul Spur CLP South



Meteorological tower at Paul Spur CLP South  
– 07/2008

### Payson Well Site

Site Purpose: NAAQS compliance network.

The site is located in the southern area of Payson, at a water well site. To the southeast of the site are two tanks. In general, the surrounding area is commercial with some residential land use. Directly to the west, on the other side of a metal fence, is an auto repair shop and 290 meters to the east is SR 87. This site is used to meet the PM<sub>10</sub> collocation requirement.

### Site Information

AQS ID	04-007-0008	ADEQ ID	16317
Address	204 W. Aero Dr. Payson, AZ 85541		
County	Gila	Groundcover	Gravel
CBSA	Payson	Latitude	34.2294
Surrounding Area	Residential/Commercial	Longitude	-111.3297
Distance to road	80 m – S	Elevation	1,501 m
Traffic count	1,724 – Aero Dr.	Site Established Date	01/01/1991

### Monitoring Information

Monitor	PM <sub>10</sub>	PM <sub>10</sub>	Wind	Temp/RH
Network	SLAMS	SLAMS	MET	MET
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	01/01/1991	01/01/1991	05/30/1991	05/30/1991
Instrument	R&P Partisol 2000	Thermo Partisol 2000	RM Young 5103 Anemometer	Vaisala HMP 45C Probe
Instrument Start Date	06/30/2003	07/01/2009	05/30/1991	06/19/2003

### Site Photos



Aerial view of Payson Well Site



Payson Well Site meteorological tower and particulate monitor on platform – 04/2008

### Petrified Forest National Park

Site Purpose: monitor regional haze and IMPROVE program.

The site is operated by the NPS and is located 1.6 km north of park headquarters. The park sits along I-40 and the surrounding area is desert.

#### Site Information

AQS ID	04-001-0012	ADEQ ID	16473
Address	I-40 & Petrified Forest Rd. Petrified Forest National Park, AZ		
County	Apache	Groundcover	Dirt
CBSA	None	Latitude	35.0770
Surrounding Area	Desert	Longitude	-109.7690
Distance to road	1,050 m – SW	Elevation	1,766 m
Traffic count	15,246 – I-40	Site Established Date	03/02/1988

#### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Visibility		
Spatial Scale	Regional		
Monitor Start Date	03/02/1988		
Instrument	IMPROVE		
Instrument Start Date	03/02/1988		

#### Site Photos



Regional view of Petrified Forest NP



Photo of Petrified Forest NP taken from IMPROVE website – date unknown

### Phoenix Transmissometer Receiver

Site Purpose: monitor urban haze.

The site is located in downtown Phoenix on the rooftop of the Holiday Inn Hotel near 2<sup>nd</sup> Avenue and Osborn Road. The transmitter is located on top of the Phoenix Baptist Hospital 4.5 km to the northwest. The area between the two sites is a mix of residential and commercial.

#### Site Information

AQS ID	None	ADEQ ID	16829
Address	3600 N. 2 <sup>nd</sup> Ave. Phoenix, AZ 85013		
County	Maricopa	Groundcover	Rooftop
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.4901
Surrounding Area	Commercial/Residential	Longitude	-112.0767
Distance to road	25 m – E	Elevation	337 m
Traffic count	1,5470 – Central Ave.	Site Established Date	12/01/1992

#### Monitoring Information

Monitor	Bext	Temp/RH	
Network	Urban Haze	Urban Haze	
Objective	Urban Haze	Urban Haze	
Spatial Scale	Urban	Urban	
Monitor Start Date	12/01/1992	01/01/1994	
Instrument	Optec LVP-2 Trans Receiver	Rotronics MP101A Probe	
Instrument Start Date	12/01/1992	06/09/2003	

#### Site Photos



Aerial view of Phoenix Transmissometer Receiver



Phoenix Transmissometer Receiver on hotel rooftop – 11/2008

### Phoenix Transmissometer Transmitter

Site Purpose: monitor urban haze.

The transmitter is located on the rooftop of Phoenix Baptist Hospital at 19<sup>th</sup> Avenue and Bethany Home Road. The receiver is located at the Holiday Inn Hotel 4.5 km to the southeast. The area between the two sites is a mix of residential and commercial.

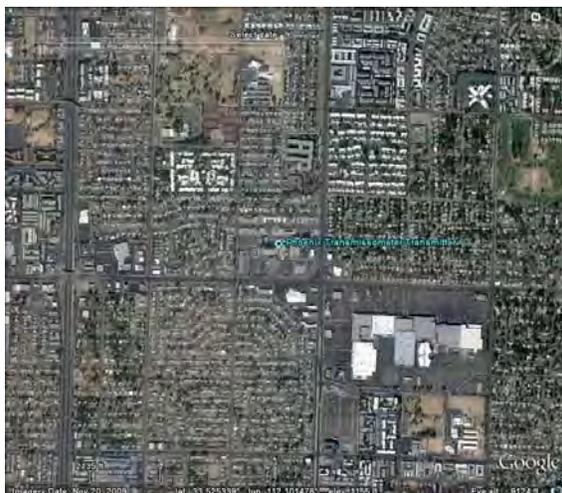
#### Site Information

AQS ID	None	ADEQ ID	16330
Address	2000 W. Bethany Home Rd. Phoenix, AZ 85015		
County	Maricopa	Groundcover	Rooftop
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.5253
Surrounding Area	Commercial/Residential	Longitude	-112.1019
Distance to road	120 m – S	Elevation	340 m
Traffic count	40,950 – Bethany Home Rd.	Site Established Date	12/01/1992

#### Monitoring Information

Monitor	Bext		
Network	Urban Haze		
Objective	Urban Haze		
Spatial Scale	Urban		
Monitor Start Date	12/01/1992		
Instrument	Optec LVP-2 Transmissometer		
Instrument Start Date	12/01/1992		

#### Site Photos



Aerial view of Phoenix Transmissometer  
Transmitter

No photo

### Pleasant Valley Ranger Station

Site Purpose: monitor regional haze and IMPROVE program.

The site is operated by USFS. The site is located on a hilltop south of Young, AZ, within the Sierra Ancha Wilderness and Tonto National Forest. The surrounding area is a transitional zone between desert and forest. The site lies 1,160 meters to the south of SR 288.

#### Site Information

AQS ID	04-007-8100	ADEQ ID	16446
Address	SR 288 & Old Cherry Rd. Young, AZ 85541		
County	Gila	Groundcover	Dirt
CBSA	Payson	Latitude	34.0908
Surrounding Area	Desert/Forest	Longitude	-110.9419
Distance to road	250 m – N	Elevation	1,587 m
Traffic count	143 – SR 288	Site Established Date	01/01/2000

#### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Visibility		
Spatial Scale	Regional		
Monitor Start Date	02/10/2000		
Instrument	IMPROVE		
Instrument Start Date	02/10/2000		

#### Site Photos



Regional view of Pleasant Valley Ranger Station



Shelter at Pleasant Valley Ranger Station – 08/2008

### Prescott College AQD

Site Purpose: NAAQS compliance network and monitor smoke/public information.

The site is located at Prescott College on the rooftop of the Mogollon Building (#307). The surrounding area is residential and commercial, with a high traffic street approximately 20 meters to the east and large trees to the west. Due to the close proximity of this site to the nearby road, ADEQ plans to relocate the ozone monitor to a more favorable location.

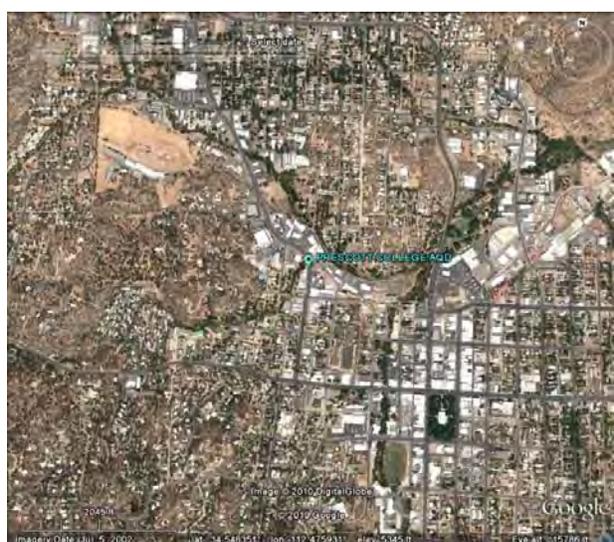
#### Site Information

AQS ID	04-025-8033	ADEQ ID	133011
Address	330 Grove Ave., Prescott, AZ 86301		
County	Yavapai	Groundcover	Rooftop
CBSA	Prescott	Latitude	34.5467
Surrounding Area	Residential/Commercial	Longitude	-112.4761
Distance to road	8 m – E	Elevation	1,591 m
Traffic count	21,945 – Grove Ave.	Site Established Date	12/05/2006

#### Monitoring Information

Monitor	O <sub>3</sub>	PM <sub>2.5</sub>	
Network	SLAMS	Non-regulatory SPM	
Objective	Population	Population	
Spatial Scale	Neighborhood	Neighborhood	
Monitor Start Date	03/25/2008	07/13/2011	
Instrument	Thermo 49C O3 Analyzer	Met One E-BAM	
Instrument Start Date	02/10/2012	07/13/2011	

#### Site Photos



Aerial view of Prescott College AQD



E-BAM on roof of Prescott College AQD – date unknown

## Prescott Valley

Site Purpose: NAAQS compliance network.

The site is located on the Prescott Police Department building about 1,100 meters to the north of SR 69. The surrounding area is mostly residential with some areas of open desert.

### Site Information

AQS ID	04-025-2002	ADEQ ID	18392
Address	7601 E. Civic Cir. Prescott Valley, AZ 86314		
County	Yavapai	Groundcover	Rooftop
CBSA	Prescott	Latitude	34.5950
Surrounding Area	Desert/Residential	Longitude	-112.3310
Distance to road	25 m – S	Elevation	1,556 m
Traffic count	2,400 – Civic Circle N.	Site Established Date	03/12/2003

### Monitoring Information

Monitor	PM <sub>10</sub>	PM <sub>2.5</sub>	
Network	SLAMS	NAAQS-SPM	
Objective	Population	Population	
Spatial Scale	Neighborhood	Neighborhood	
Monitor Start Date	03/16/2003	12/28/2007	
Instrument	R&P Partisol 2000	Thermo Partisol 2000	
Instrument Start Date	12/28/2007	12/28/2007	

### Site Photos



Aerial view of Prescott Valley



Particulate monitors on rooftop of Prescott Police Department – 10/2008

### Queen Valley

**Site Purpose:** NAAQS compliance network, PAMS network, monitor regional haze, AQI forecasting, and IMPROVE program.

The site is located in northern Pinal County on the far east/southeastern outskirts of the Phoenix metropolitan area. It is located 635 meters southeast of the small town of Queen Valley, AZ and the surrounding area is primarily desert. This is a downwind PAMS type 3 site. This is also an IMPORVE protocol site.

#### Site Information

AQS ID	04-021-8001	ADEQ ID	16394
Address	10 S. Queen Anne Dr. Queen Valley, AZ 85219		
County	Pinal	Groundcover	Gravel
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.2938
Surrounding Area	Desert	Longitude	-111.2857
Distance to road	87 m – W	Elevation	668 m
Traffic count	1,284 – Queen Anne Dr.	Site Established Date	01/01/1998

#### Monitoring Information

Monitor	O <sub>3</sub>	NO <sub>y</sub>	VOC	Wind
Network	SLAMS/PAMS	PAMS	PAMS	MET
Objective	Transport	Transport	Transport	Population
Spatial Scale	Urban	Urban	Urban	Neighborhood
Monitor Start Date	01/01/1998	01/01/1998	05/20/2001	06/23/2003
Instrument	Teledyne API 400E O <sub>3</sub> Analyzer	Thermo 42C TL Reactive NO <sub>x</sub>	Met One 8001 Canister Sampler	RM Young 5103 Anemometer
Instrument Start Date	03/16/2011	05/09/2011	06/01/2010	04/19/2011

#### Monitoring Information

Monitor	Temp/RH	Aerosol		
Network	MET	IMPROVE		
Objective	Population	Visibility		
Spatial Scale	Neighborhood	Regional		
Monitor Start Date	06/23/2003	04/30/2001		
Instrument	Vaisala HMP45C Probe	IMPROVE		
Instrument Start Date	04/19/2011	04/30/2001		

## Site Photos



Regional view of Queen Valley



Shelter at Queen Valley site – 5/10/2011

### Rillito

Site Purpose: NAAQS compliance network and a source permit requirement.

In February of 2007 the site was moved from the Water St. location 91 meters southwest to its current location at a city water pumping station. The surrounding area is primarily residential and industrial, with I-10 approximately 250 meters to the east. The site is located within the small town of Rillito, AZ and is approximately 500 meters to the north/northwest of the Cal Portland Rillito Cement Plant.

#### Site Information

AQS ID	04-019-0020	ADEQ ID	16499
Address	8840 W. Robinson St. Rillito, AZ 85653		
County	Pima	Groundcover	Dirt
CBSA	Tucson	Latitude	32.4143
Surrounding Area	Residential	Longitude	-111.1545
Distance to road	7 m – S	Elevation	626 m
Traffic count	2,634 – I-10 Frontage Rd.	Site Established Date	01/01/1985

#### Monitoring Information

Monitor	PM <sub>10</sub>	Wind	Temp/RH	
Network	SLAMS	MET	MET	
Objective	Source	Source	Source	
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	
Monitor Start Date	01/03/1985	01/08/2004	03/30/2010	
Instrument	R&P 1400 AB TEOM	RM Young 5103 Anemometer	Vaisala HMP 45C Probe	
Instrument Start Date	03/30/2010	01/08/2004	03/30/2010	

#### Site Photos



Aerial view of Rillito



Rillito meteorological tower and particulate monitors on platform – 03/2010

### Saguaro National Park East

Site Purpose: monitor regional haze and IMPROVE program.

The site is located within the Saguaro National Park East, 805 meters south of park headquarters and is operated jointly by PDEQ and NPS. The area surrounding the site is scattered residential to the west and desert to the east.

#### Site Information

AQS ID	04-019-0021	ADEQ ID	16474
Address	3905 S. Old Spanish Trail Tucson, AZ 85730		
County	Pima	Groundcover	Dirt
CBSA	Tucson	Latitude	32.1740
Surrounding Area	Residential/Desert	Longitude	-110.7360
Distance to road	82 m – W	Elevation	938 m
Traffic count	6,198 – Old Spanish Tail	Site Established Date	06/04/1988

#### Monitoring Information

Monitor	Aerosol			
Network	IMPROVE			
Objective	Visibility			
Spatial Scale	Regional			
Monitor Start Date	06/04/1988			
Instrument	IMPROVE			
Instrument Start Date	06/04/1988			

#### Site Photos



Regional view of Saguaro NP East



Photo of Saguaro NP East taken from IMPROVE website – date unknown

### Saguaro National Park West

Site Purpose: monitor regional haze and IMPROVE program.

The site is located within the Saguaro National Park West. The site is operated by the NPS. The area surrounding the site is residential to the northwest and south/southeast and desert to the northeast. The site lies approximately 17 km southwest of I-10. This is an IMPROVE protocol site.

#### Site Information

AQS ID	04-019-9000	ADEQ ID	16475
Address	N. Sandario Rd. and W. Mile Wide Rd. Tucson, AZ		
County	Pima	Groundcover	Gravel
CBSA	Tucson	Latitude	32.2485
Surrounding Area	Desert	Longitude	-111.2175
Distance to road	27 m – W	Elevation	718 m
Traffic count	1,889 – Mile Wide Rd.	Site Established Date	12/29/1996

#### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Visibility		
Spatial Scale	Regional		
Monitor Start Date	04/19/2001		
Instrument	IMPROVE		
Instrument Start Date	04/19/2001		

#### Site Photos



Regional view of Saguaro NP West



Shelters and towers at Saguaro NP West site – 03/2003

### San Luis Rio Colorado

Site Purpose: special purpose monitoring.

The site is located at the Oomapas Well # 10 site at the corner of Av. Venustiano Carranza and C. 15 in San Luis Rio Colorado, Sonora, Mexico. The site is approximately 1.6 km south of the Arizona-Mexico border. The surrounding area is mixed commercial and residential use.

\*Note this site was previously used the in WASBAQS study. **In the summer of 2011, this site was closed due to funding constraints.**

#### Site Information

AQS ID	80-026-8012	ADEQ ID	113221
Address	Av. Venustiano Carranza and C. 15 in San Luis Rio Colorado, Sonora, Mexico		
County	Sonora	Groundcover	Dirt
CBSA	None	Latitude	32.4664
Surrounding Area	Commercial/Residential	Longitude	-114.7688
Distance to road	5 m – S & E	Elevation	41 m
Traffic count	n/a	Site Established Date	07/05/2009

#### Monitoring Information

Monitor	PM <sub>10</sub>	PM <sub>2.5</sub>		
Network	Non-regulatory SPM	Non-regulatory SPM		
Objective	Population	Population		
Spatial Scale	Neighborhood	Neighborhood		
Monitor Start Date	07/05/2009	7/05/2009		
Instrument	Partisol Dichot	Partisol Dichot		
Instrument Start Date	06/15/2009	06/15/2009		

#### Site Photos



Aerial view of San Luis Rio Colorado

No photo

### Sedona Fire Station AQD

Site Purpose: monitor smoke/public information.

In 2011, the EBAM instrument in Sedona was moved from the Sedona Post Office site to the Sedona Fire Station site due to concerns about local emissions affecting the monitor. The Sedona Fire Station site is located approximately 300 meters to the northeast of the Sedona Post Office site. The surrounding area is composed of residential and commercial use.

#### Site Information

AQS ID	None	ADEQ ID	142818
Address	310 Forest Rd, Sedona, AZ 86336		
County	Coconino	Groundcover	Rooftop
CBSA	Flagstaff	Latitude	34.8683
Surrounding Area	Commercial/Residential	Longitude	-111.7633
Distance to road	30 m – S	Elevation	1,326 m
Traffic count	n/a	Site Established Date	12/16/2011

#### Monitoring Information

Monitor	PM <sub>2.5</sub>		
Network	Non-regulatory SPM		
Objective	Population		
Spatial Scale	Neighborhood		
Monitor Start Date	12/16/2011		
Instrument	Met One E-BAM		
Instrument Start Date	12/16/2011		

#### Site Photos



Aerial view of Sedona Fire Station



E-BAM on roof at Sedona Fire Station –  
12/2011

### Sedona Post Office

Site Purpose: monitor smoke/public information.

The site is located on the U.S. Post Office building and was established to assess particulate concentrations in the Sedona area. The surrounding area is commercial and residential to the south and mainly hills to the north, east, and west. The site is located northeast of the intersection of SR 179 and SR 89A. **This site was closed in December, 2011**, when the EBAM instrument was moved 300 meters northeast to the Sedona Fire Station AQD site due to concerns about local emissions affecting the monitor.

### Site Information

AQS ID	04-005-1010	ADEQ ID	16512
Address	190 W. Highway 89A Sedona, AZ 86336		
County	Coconino	Groundcover	Rooftop
CBSA	Flagstaff	Latitude	34.8667
Surrounding Area	Commercial/Residential	Longitude	-111.765
Distance to road	45 m – S	Elevation	1,279 m
Traffic count	25,193 – SR 89A	Site Established Date	01/01/1992

### Monitoring Information

Monitor	PM <sub>2.5</sub>		
Network	Non-regulatory SPM		
Objective	Population		
Spatial Scale	Neighborhood		
Monitor Start Date	08/02/2011		
Instrument	Met One E-BAM		
Instrument Start Date	08/02/2011		

### Site Photos



Aerial view of Sedona Post Office



E-BAM on roof of Sedona Post Office – date unknown

**Show Low**

Site Purpose: monitor smoke/public information.

The site is located on the Historical Museum building and was originally established to demonstrate compliance with the PM<sub>10</sub> NAAQS. Currently the site is used for neighborhood monitoring of smoke. The surrounding area is residential and commercial. Show Low is the commercial and tourism hub of the western White Mountains and sees a seasonal increase in population by 5,000 people.

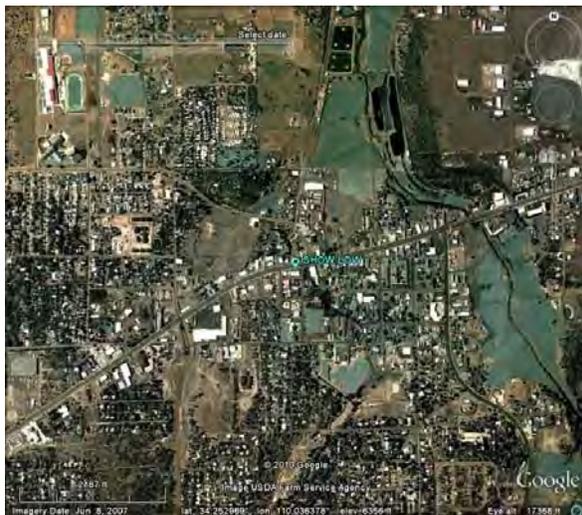
**Site Information**

AQS ID	04-017-0007	ADEQ ID	16603
Address	561 E. Deuce of Clubs Show Low, AZ 85901		
County	Navajo	Groundcover	Rooftop
CBSA	None	Latitude	34.2525
Surrounding Area	Commercial/Residential	Longitude	-110.0364
Distance to road	36 m – NW	Elevation	1,924 m
Traffic count	9,500 – Deuce of Clubs	Site Established Date	01/01/1974

**Monitoring Information**

Monitor	PM <sub>2.5</sub>		
Network	Non-regulatory SPM		
Objective	Population		
Spatial Scale	Neighborhood		
Monitor Start Date	06/08/2011		
Instrument	Met One E-BAM		
Instrument Start Date	06/08/2011		

**Site Photos**



Aerial view of Show Low

No Photo

### Sonora Nogales Fire Station

Site Purpose: special purpose monitoring.

The site is located on the rooftop of the Fire Station in Nogales, Mexico, approximately 600 meters south of the Arizona/Mexico border. The surrounding area is urban with a mix of commercial and residential use. **In the summer of 2011, this site was closed due to funding constraints.**

#### Site Information

AQS ID	80-026-0005	ADEQ ID	16399
Address	Diaz and Avenue Adolfo Lopez Mateos Nogales, Sonora, Mexico		
County	Sonora	Groundcover	Rooftop
CBSA	None	Latitude	31.3258
Surrounding Area	Commercial/Residential	Longitude	-110.9447
Distance to road	3 m – NE	Elevation	1,202 m
Traffic count	n/a	Site Established Date	11/01/1993

#### Monitoring Information

Monitor	PM <sub>10</sub>	PM <sub>2.5</sub>		
Network	Non-regulatory SPM	Non-regulatory SPM		
Objective	Population	Population		
Spatial Scale	Neighborhood	Neighborhood		
Monitor Start Date	11/01/1993	04/11/2010		
Instrument	Partisol 2000	Partisol 2000		
Instrument Start Date	04/11/2010	04/11/2010		

#### Site Photos



Aerial view of Sonora Nogales Fire Station

No photo

### South Phoenix

Site Purpose: toxics network.

The site is owned by MCAQD. ADEQ operates the toxics sampler at the site. The site is situated in South Phoenix, at the edge of a high population area, bordering a mixture of residential and commercial properties. Two high population areas are located north and west of the site.

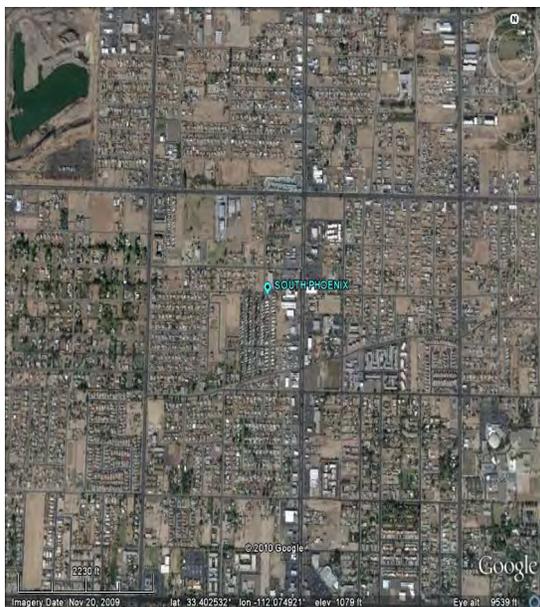
#### Site Information

AQS ID	04-013-4003	ADEQ ID	16377
Address	33 W. Tamarisk St. Phoenix, AZ 85041		
County	Maricopa	Groundcover	Asphalt
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.4030
Surrounding Area	Residential/Commercial	Longitude	-112.0750
Distance to road	83 m – W	Elevation	330 m
Traffic count	19,110 – Central Ave.	Site Established Date	01/01/1997

#### Monitoring Information

Monitor	VOC			
Network	TOXICS-UATMP			
Objective	Population			
Spatial Scale	Neighborhood			
Monitor Start Date	08/05/2001			
Instrument	ATEC 8001 Canister Sampler			
Instrument Start Date	05/20/2010			

#### Site Photos



Aerial view of South Phoenix



Shelter and meteorological tower at South Phoenix site – 04/2005

## Springerville

Site Purpose: monitor smoke/public information.

The site is located on the roof of the Apache County Public Health Services District building. There is an open field to the south and west of the site, with SR 180/SR 260 to the east, and buildings to the north.

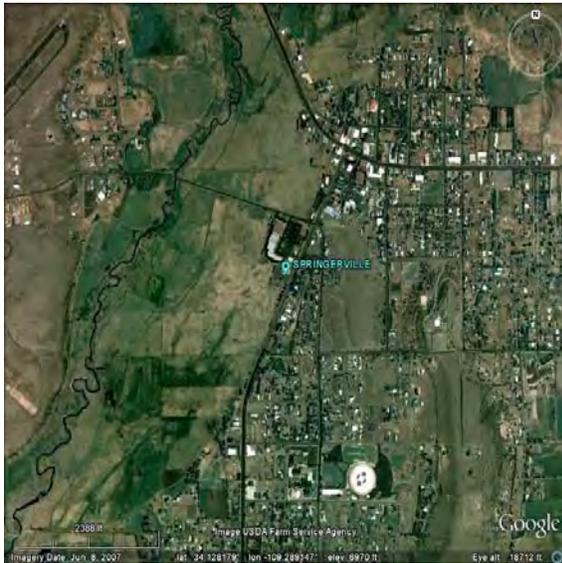
### Site Information

AQS ID	None	ADEQ ID	135133
Address	323 S. Mountain Ave., Springerville, AZ 85936		
County	Apache	Groundcover	Rooftop
CBSA	None	Latitude	34.1284
Surrounding Area	Residential/Commercial	Longitude	-109.2891
Distance to road	8 m – SW	Elevation	2,125 m
Traffic count	10,616 – S. Mountain Ave.	Site Established Date	09/24/2008

### Monitoring Information

Monitor	PM <sub>2.5</sub>		
Network	Non-regulatory SPM		
Objective	Population		
Spatial Scale	Neighborhood		
Monitor Start Date	06/08/2011		
Instrument	Met One E-BAM		
Instrument Start Date	06/08/2011		

### Site Photos



Aerial view of Springerville



Springerville E-BAM on roof of county building – 09/2008

### Sycamore Canyon

Site Purpose: monitor regional haze and IMPROVE program.

The site is located near the entrance to Camp Raymond Boy Scout Camp. Minimal obstructions exist in the area surrounding the site and no routine human activity occurs in the area surrounding the site. Sycamore Canyon Wilderness Area is 800 meters south of the site.

#### Site Information

AQS ID	04-005-8103	ADEQ ID	16476
Address	Camp Kimball Rd. Flagstaff, AZ (Camp Raymond)		
County	Coconino	Groundcover	Dirt/Grass
CBSA	Flagstaff	Latitude	35.1406
Surrounding Area	Forest	Longitude	-111.9692
Distance to road	33 m – NW	Elevation	2,046 m
Traffic count	15,048 – I-40	Site Established Date	09/11/1991

#### Monitoring Information

Monitor	Aerosol		
Network	IMPROVE		
Objective	Visibility		
Spatial Scale	Regional		
Monitor Start Date	09/11/1991		
Instrument	IMPROVE		
Instrument Start Date	09/11/1991		

#### Site Photos



Regional view of Sycamore Canyon



Shelter at Sycamore Canyon site – 09/2008

### Tonto National Monument

**Site Purpose:** NAAQS compliance network, monitor regional haze, AQI forecasting, downwind transport from Phoenix area, and IMPROVE program.

The site is jointly operated by ADEQ and USFS. The site is located within the Tonto National Forest at the base of Tonto National Monument, about 40 meters south of SR 188. The area surrounding the site is desert with Roosevelt Lake about 1 km to the north.

#### Site Information

AQS ID	04-007-0010	ADEQ ID	16447
Address	South of SR 188 Roosevelt, AZ 85545		
County	Gila	Groundcover	Dirt/Rock
CBSA	Payson	Latitude	33.6547
Surrounding Area	Desert	Longitude	-111.1074
Distance to road	17 m – NE	Elevation	786 m
Traffic count	1,073 – SR 188	Site Established Date	04/23/1988

#### Monitoring Information

Monitor	O <sub>3</sub>	Aerosol	
Network	SLAMS	IMPROVE	
Objective	Transport	Visibility	
Spatial Scale	Urban	Regional	
Monitor Start Date	05/22/2002	04/23/1988	
Instrument	Teledyne API 400E O3 Analyzer	IMPROVE	
Instrument Start Date	03/16/2011	04/23/1998	

#### Site Photos



Regional view of Tonto NM



Shelter at Tonto NM site – 07/2011

### Vehicle Emissions Laboratory

Site Purpose: AQI forecasting, PAMS, special study, monitor urban haze, and meteorological support.

The site is located in the northwest corner of the Vehicle Emissions Laboratory property. The surrounding area is a both residential and commercial, with an open field directly to the northwest. The site is about 415 meters south of Red Mountain Freeway (Loop 202).

#### Site Information

AQS ID	04-013-9998	ADEQ ID	16363
Address	600 N. 40 <sup>th</sup> St. Phoenix, AZ 85008		
County	Maricopa	Groundcover	Gravel
CBSA	Phoenix-Mesa-Scottsdale	Latitude	33.4553
Surrounding Area	Residential/Commercial	Longitude	-111.9961
Distance to road	66 m – E	Elevation	356 m
Traffic count	12,740 – 40 <sup>th</sup> St.	Site Established Date	04/01/1987

#### Monitoring Information

Monitor	Bscat/PM <sub>2.5</sub>	Wind	Temp/RH	Delta Temp
Network	Urban Haze	MET	Urban Haze	PAMS
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	06/25/2003	05/11/1999	05/11/1999	08/20/2004
Instrument	Optec NGN 2 Nephelometer	RM Young 5305 Anemometer	Rotronics MP101A Probe	RM Young RTD 7627 Delta Temp System
Instrument Start Date	06/25/2003	05/11/1999	06/30/2003	08/20/2004

#### Monitoring Information

Monitor	Ultraviolet Solar Radiation	Total Horizontal Solar Radiation	Wind Profiler	
Network	PAMS	PAMS	PAMS	
Objective	Population	Population	Population	
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	
Monitor Start Date	08/20/2004	06/18/1999	01/01/1998	
Instrument	Epply TUVR Ultraviolet Sensor	Li-Cor LI-200S2 Pyranometer	Vaisala LAP-3000 Wind Profiler	
Instrument Start Date	08/20/2004	06/18/1999	01/01/1998	

## Site Photos



Aerial view of Vehicle Emissions Laboratory



Wind profiler, meteorological tower, and shelter at VEL – 04/12/2005

### Verde Ranger Station

Site Purpose: monitor smoke/public information

The site is located at the Verde Ranger Station in Camp Verde. The monitor is located on a metal platform that is on a concrete slab surrounded by dirt and rocks. Ranger Station buildings are to the northeast and northwest and there are solar panels to the east of the monitor.

#### Site Information

AQS ID	None	ADEQ ID	138696
Address	300 E. Highway 260 Camp Verde, AZ 86322		
County	Yavapai	Groundcover	Dirt
CBSA	Prescott	Latitude	34.5489
Surrounding Area	Residential/Desert	Longitude	-111.8472
Distance to road	70 m – S	Elevation	945 m
Traffic count	6,075 – SR 260	Site Established Date	01/01/2008

#### Monitoring Information

Monitor	PM <sub>2.5</sub>			
Network	Non-regulatory SPM			
Objective	Population			
Spatial Scale	Neighborhood			
Monitor Start Date	08/02/2011			
Instrument	Met One E-BAM			
Instrument Start Date	08/02/2011			

#### Site Photos



Aerial view of Verde Ranger Station



E-BAM on platform at Verde Ranger Station  
– 2/2010

### Yuma Supersite

Site Purpose: NAAQS compliance network and AQI forecasting.

The site was reopened in 2008 and has been used to consolidate air quality monitors in the Yuma area to one site. The site is located on the southeast corner of the Rural Metro Administration Facility property. The surrounding area is commercial and industrial, with a dirt lot adjacent to the south and I-8 1 km to the northeast. In addition to NAAQS compliance, the site is also used to help understand transport of PM and Ozone.

#### Site Information

AQS ID	04-027-8011	ADEQ ID	113219
Address	2323 S. Arizona Ave. Yuma, AZ 85364		
County	Yuma	Groundcover	Rooftop
CBSA	Yuma	Latitude	32.6903
Surrounding Area	Commercial/Industrial	Longitude	-114.6144
Distance to road	91 m – W	Elevation	60 m
Traffic count	12,302 – Arizona Ave.	Site Established Date	02/01/2006

#### Monitoring Information

Monitor	O <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	Wind
Network	SLAMS	SLAMS	SPM	MET
Objective	Population	Population	Population	Population
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Start Date	05/06/2008	12/01/2009	01/01/2010	03/17/2010
Instrument	Teledyne API 400E O <sub>3</sub> Analyzer	R&P 1400 AB TEOM	R&P Partisol 2000	RM Young 5305 Anemometer
Instrument Start Date	03/03/2011	12/01/2009	01/01/2010	03/17/2010

#### Monitoring Information

Monitor	Temp/RH			
Network	MET			
Objective	Population			
Spatial Scale	Neighborhood			
Monitor Start Date	03/17/2010			
Instrument	Vaisala HMP 155 Probe			
Instrument Start Date	03/17/2010			

**Site Photos**



Aerial view of Yuma Supersite

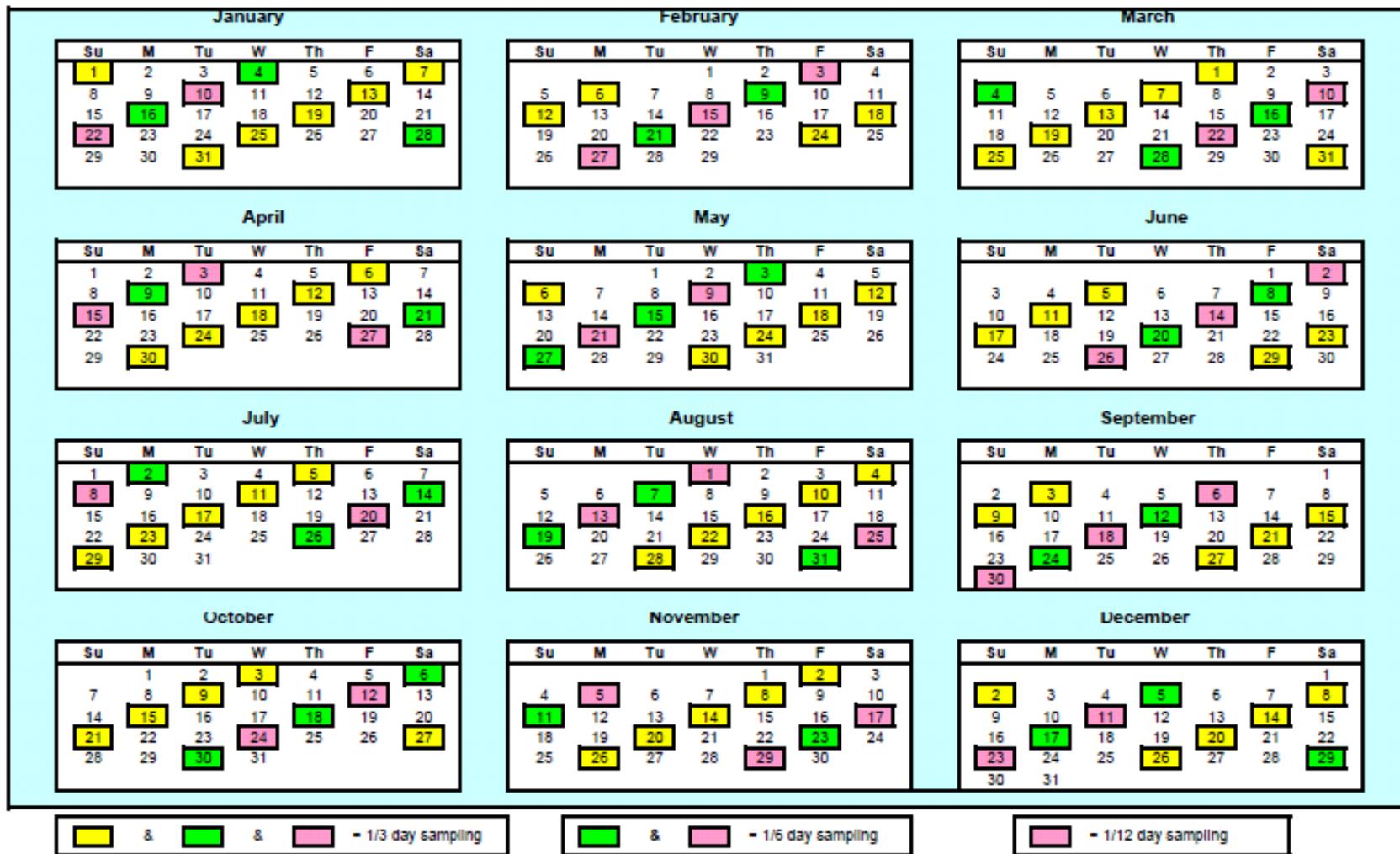


Shelter and Met Tower at Yuma Supersite –  
5/19/2011

# Appendix E – 2012 EPA Monitoring Schedule

## 2012 Monitoring Schedule

3-day & 6-day Monitoring Schedule for TSP, Pb, PM-10, PM-2.5, and VOC. 12-day Monitoring Schedule for PM-2.5 Collocation.



## **Appendix F – Data Quality Indicator Report**

This Appendix provides documentation of the Quality Control / Quality Assurance requirements for all monitors within ADEQ's criteria pollutant network for calendar year 2011. For a detailed interpretation of this report, see ADEQ's 2011 data certification letter.

User ID: BNE

DATA QUALITY INDICATOR REPORT

Report Request ID: 996565

Report Code: AMP255

Jun. 4, 2012

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region	Method	Duration	Begin Date	End Date
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04

PROTOCOL SELECTIONS

PQAO SELECTIONS

Parameter Classification	Parameter	Method	Duration
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Freeport McMoran Miami, Inc.  
 Arizona Department Of Environmental Quality

APP\_A\_PARAMETERS

SELECTED OPTIONS

Option Type	Option Value
INCLUDE ONLY APPENDIX A MONITORS	NO
RESTRICT TO MONITORING SEASONS	YES
MERGE PDF FILES	YES

GLOBAL DATES

Start Date	End Date
2011 01 01	2011 12 31

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM

DATA QUALITY INDICATOR REPORT

Jun. 4, 2012

Notes About this Report

For specific information about the fields appearing within this report, please refer to the README.txt file that is included with the WORKFILE output for this report.

**M**

If you see this value for a column in a summarized row, this means that more than one occurrence exist in the summary. For example, if you have a PQAO summary that spans multiple States, you would see this value in the States column.

Code Listing

The following codes may be seen in the "MT" column throughout this report. Please be advised that not all of the codes may appear in the report. They are provided for completeness.

<u>Code</u>	<u>Description</u>	<u>Code</u>	<u>Description</u>
NR	NON-REGULATORY	S	SLAMS
P	PAMS	T	TRIBAL MONITORS
SP	SPECIAL PURPOSE	I	IMPROVE
NC	NCORE	IX	INDEX SITE
ID	INDUSTRIAL	N	NAMS
NA	NATTS	CN	CASTNET
F	NON-EPA FEDERAL	O	OTHER
PN	PROPOSED NCORE	ST	SCHOOL AIR TOXICS
VS	VOL SCHOOL AT	QA	QA COLLOCATED
X	SECURED	SS	SLAMS SPECIATION
SU	SUPLMNTL SPECIATION	SU	SUPPLMNTL SPECIATION
TS	TRENDS SPECIATION	U	UNKNOWN
UP	UNOFFICIAL PAMS	W	WHO
M	WMO		

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM**

**DATA QUALITY INDICATOR REPORT**

Jun. 4, 2012

**1-Point Quality Control**

**Pollutant:** CO

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>% Complete</u>	<u>CV</u>	<u>Bias</u>
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11	26	15	58	7.09	+/- 5.74
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>26</b>	<b>15</b>	<b>58</b>	<b>7.09</b>	<b>+/- 5.74</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>26</b>	<b>15</b>	<b>58</b>	<b>7.09</b>	<b>+/- 5.74</b>

**Pollutant:** NO2

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>% Complete</u>	<u>CV</u>	<u>Bias</u>
2011	09	AZ	04-013-9997	1	S	01-JAN-11	31-DEC-11	26	21	81	2.96	+ 2.51
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>26</b>	<b>21</b>	<b>81</b>	<b>2.96</b>	<b>+ 2.51</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>26</b>	<b>21</b>	<b>81</b>	<b>2.96</b>	<b>+ 2.51</b>

**Pollutant:** O3

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>% Complete</u>	<u>CV</u>	<u>Bias</u>
2011	09	AZ	04-005-1008	1	S	01-APR-11	31-OCT-11	15	11	73	4.35	+ 3.87
2011	09	AZ	04-007-0010	1	S	01-APR-11	31-OCT-11	15	9	60	4.98	+/- 4.02
2011	09	AZ	04-012-8000	1	S	01-APR-11	31-OCT-11	15	11	73	4.43	+/- 3.64
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11	26	18	69	3.58	+ 3.30
2011	09	AZ	04-021-8001	1	S	01-APR-11	31-OCT-11	15	14	93	4.60	+ 3.84
2011	09	AZ	04-025-8033	1	S	01-APR-11	31-OCT-11	15	14	93	4.08	+ 3.76
2011	09	AZ	04-027-8011	1	S	01-APR-11	31-OCT-11	15	12	80	2.18	+ 2.03
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>116</b>	<b>89</b>	<b>77</b>	<b>3.14</b>	<b>+ 2.77</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>116</b>	<b>89</b>	<b>77</b>	<b>3.14</b>	<b>+ 2.77</b>

**Pollutant:** SO2

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>% Complete</u>	<u>CV</u>	<u>Bias</u>
2011	09	AZ	04-007-0009	1	S	01-JAN-11	31-DEC-11	26	22	85	3.24	+ 3.35
2011	09	AZ	04-007-1001	3	S	01-JAN-11	31-DEC-11	26	21	81	3.87	+ 3.74
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11	26	28	100	7.03	+/- 4.65

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM

**DATA QUALITY INDICATOR REPORT**

Jun. 4, 2012

1-Point Quality Control

**Pollutant:** SO2

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>% Complete</u>	<u>CV</u>	<u>Bias</u>
2011	09	AZ	<b>SUMMARY</b>					78	71	89	4.97	+/- 3.58
<b>SUMMARY</b>	09	AZ						78	71	89	4.97	+/- 3.58

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM**

**DATA QUALITY INDICATOR REPORT**

Jun. 4, 2012

**Annual Performance Evaluations**

**Pollutant:** CO

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	Avg %D / Level					Obs / Q				Criteria Met?	1-Point Conf. Limits		% Btwn Conf. Limits
								L1/6	L2/7	L3/8	L4/9	L5/10	Q1	Q2	Q3	Q4		Lower	Upper	
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11	81.30	23.43	7.94	2.62	0	0	4	0	Y				
								(Levels 6 thru 10)												

2011	09	AZ	<b>SUMMARY</b>					81.30	23.43	7.94	2.62	0	0	4	0	100	-9.08	11.64	50
								(Levels 6 thru 10)											

<b>SUMMARY</b>	09	AZ						81.30	23.43	7.94	2.62	0	0	4	0	100	-9.08	11.64	50
								(Levels 6 thru 10)											

**Pollutant:** NO2

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	Avg %D / Level					Obs / Q				Criteria Met?	1-Point Conf. Limits		% Btwn Conf. Limits
								L1/6	L2/7	L3/8	L4/9	L5/10	Q1	Q2	Q3	Q4		Lower	Upper	
2011	09	AZ	04-013-9997	1	S	01-JAN-11	31-DEC-11						3	0	4	0	N			
								(Levels 6 thru 10)					-1.69 -3.51							

2011	09	AZ	<b>SUMMARY</b>										3	0	4	0	0	-3.73	5.41	71
								(Levels 6 thru 10)					-1.69 -3.51							

<b>SUMMARY</b>	09	AZ											3	0	4	0	0	-3.73	5.41	71
								(Levels 6 thru 10)					-1.69 -3.51							

**Pollutant:** O3

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	Avg %D / Level					Obs / Q				Criteria Met?	1-Point Conf. Limits		% Btwn Conf. Limits
								L1/6	L2/7	L3/8	L4/9	L5/10	Q1	Q2	Q3	Q4		Lower	Upper	
2011	09	AZ	04-005-1008	1	S	01-APR-11	31-OCT-11						0	5	0	0	Y			
								(Levels 6 thru 10)					-1.90 -2.00 -2.02							

2011	09	AZ	04-007-0010	1	S	01-APR-11	31-OCT-11						0	0	5	0	Y		
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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM**

**DATA QUALITY INDICATOR REPORT**

Jun. 4, 2012

**Annual Performance Evaluations**

**Pollutant:** O3

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	Avg %D / Level					Obs / Q				Criteria Met?	1-Point Conf. Limits		% Btwn Conf. Limits		
								L1/6	L2/7	L3/8	L4/9	L5/10	Q1	Q2	Q3	Q4		Lower	Upper			
								(Levels 6 thru 10)	5.90	5.86			7.00									
2011	09	AZ	04-012-8000	1	S	01-APR-11	31-OCT-11					0.00	-2.25	0	0	5	0	Y				
								(Levels 6 thru 10)	-2.00	-2.46			-2.93									
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11					0.00	3.73	1.92	5	0	5	5	Y			
								(Levels 6 thru 10)	2.95	2.18			-0.85	1.94								
2011	09	AZ	04-021-8001	1	S	01-APR-11	31-OCT-11					9.56	3.88	0	0	5	0	Y				
								(Levels 6 thru 10)	2.20	1.15			-1.90									
2011	09	AZ	04-025-8033	1	S	01-APR-11	31-OCT-11					-0.45	-1.38	0	5	0	0	Y				
								(Levels 6 thru 10)	-0.80	-0.85			-0.82									
2011	09	AZ	04-027-8011	1	S	01-APR-11	31-OCT-11					0.00	-2.88	0	5	0	0	Y				
								(Levels 6 thru 10)	-3.00	-2.92			-2.93									
2011	09	AZ	<b>SUMMARY</b>									0.00	2.52	0.36	5	15	20	5	100	-3.92	7.18	98
								(Levels 6 thru 10)	0.48	0.14			-0.85	-0.24								
<b>SUMMARY</b>	09	AZ										0.00	2.52	0.36	5	15	20	5	100	-3.92	7.18	98
								(Levels 6 thru 10)	0.48	0.14			-0.85	-0.24								

**Pollutant:** SO2

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	Avg %D / Level					Obs / Q				Criteria Met?	1-Point Conf. Limits		% Btwn Conf. Limits	
								L1/6	L2/7	L3/8	L4/9	L5/10	Q1	Q2	Q3	Q4		Lower	Upper		
2011	09	AZ	04-007-0009	1	S	01-JAN-11	31-DEC-11							0	5	0	0	Y			
								(Levels 6 thru 10)	5.08	4.24	5.10	5.66	4.89								

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM

**DATA QUALITY INDICATOR REPORT**

Jun. 4, 2012

Annual Performance Evaluations

**Pollutant:** SO2

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	Avg %D / Level					Obs / Q				Criteria Met?	1-Point Conf. Limits		% Btwn Conf. Limits
								L1/6	L2/7	L3/8	L4/9	L5/10	Q1	Q2	Q3	Q4		Lower	Upper	
2011	09	AZ	04-007-1001	3	S	01-JAN-11	31-DEC-11						0	0	5	0	Y			
							(Levels 6 thru 10)	-1.08	1.04	0.20	1.26	0.49								
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11						3	0	13	8	Y			
							(Levels 6 thru 10)	-18.30	-24.60	-7.23	-38.29	-5.97								
2011	09	AZ	<b>SUMMARY</b>										3	5	18	8	100	-7.72	9.58	65
							(Levels 6 thru 10)	-4.77	-6.44	-0.64	-10.46	-0.20								
<b>SUMMARY</b>	09	AZ											3	5	18	8	100	-7.72	9.58	65
							(Levels 6 thru 10)	-4.77	-6.44	-0.64	-10.46	-0.20								

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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**DATA QUALITY INDICATOR REPORT**

Jun. 4, 2012

**Flow Rate Verifications**

**Pollutant:** LEAD

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>Average % D</u>	<u>% Complete</u>	<u>Bias</u>
2011	09	AZ	04-007-1002	1	S	01-JAN-11	31-DEC-11	4	38	-0.06	100	+/- 4.24
2011	09	AZ	04-007-1002	2	S	01-JAN-11	31-DEC-11	4	41	-0.71	100	+/- 3.93
2011	09	AZ	04-007-8000	1	S	01-JAN-11	31-DEC-11	4	38	-1.00	100	+/- 4.02
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>12</b>	<b>117</b>	<b>-0.59</b>	<b>100</b>	<b>+/- 3.76</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>12</b>	<b>117</b>	<b>-0.59</b>	<b>100</b>	<b>+/- 3.76</b>

**Pollutant:** PM10

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>Average % D</u>	<u>% Complete</u>	<u>Bias</u>
2011	09	AZ	04-003-0011	1	S	01-JAN-11	31-DEC-11	12	13	-0.66	100	+/- 2.12
2011	09	AZ	04-003-0011	2	QA	01-JAN-11	31-DEC-11	12	13	0.13	100	+/- 1.27
2011	09	AZ	04-003-1005	1	S	01-JAN-11	31-DEC-11	12	13	0.21	100	+/- 0.72
2011	09	AZ	04-005-1008	1	S	01-JAN-11	31-DEC-11	12	15	-0.14	100	+/- 1.09
2011	09	AZ	04-007-0008	1	S	01-JAN-11	31-DEC-11	12	13	0.09	100	+/- 1.35
2011	09	AZ	04-007-0008	2	QA	01-JAN-11	31-DEC-11	12	13	0.34	100	+/- 1.32
2011	09	AZ	04-007-1001	3	S	01-JAN-11	31-DEC-11	12	12	-0.01	100	+/- 1.15
2011	09	AZ	04-013-8006	1	SP	01-JAN-11	30-JUN-11	6	7	0.37	100	+/- 1.57
2011	09	AZ	04-013-9997	3	S	01-JAN-11	31-DEC-11	12	11	0.17	92	+/- 0.86
2011	09	AZ	04-013-9997	4	S	01-JAN-11	31-DEC-11	12	11	0.66	92	+ 0.96
2011	09	AZ	04-015-1003	1	S	01-JAN-11	31-DEC-11	12	14	0.34	100	+ 0.60
2011	09	AZ	04-019-0001	3	S	01-JAN-11	31-DEC-11	12	14	0.46	100	+/- 1.21
2011	09	AZ	04-019-0020	3	S	01-JAN-11	31-DEC-11	12	13	0.17	100	+/- 0.84
2011	09	AZ	04-023-0004	1	S	01-JAN-11	31-DEC-11	12	14	-0.23	100	+/- 0.80
2011	09	AZ	04-023-0004	3	SP	01-JAN-11	31-DEC-11	12	14	0.65	100	+ 1.43
2011	09	AZ	04-025-2002	1	S	01-JAN-11	31-DEC-11	12	14	-0.13	100	+/- 0.61
2011	09	AZ	04-027-8011	3	S	01-JAN-11	31-DEC-11	12	14	0.40	100	+/- 1.54
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>198</b>	<b>218</b>	<b>0.16</b>	<b>99</b>	<b>+/- 0.89</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>198</b>	<b>218</b>	<b>0.16</b>	<b>99</b>	<b>+/- 0.89</b>

**Pollutant:** PM10

**PQAO:** 1357 (Freeport McMoRan Miami, Inc.)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>Average % D</u>	<u>% Complete</u>	<u>Bias</u>
2011	09	AZ	04-007-0009	1	ID	01-JAN-11	31-DEC-11	12	40	-0.80	100	- 1.66
2011	09	AZ	04-007-8000	1	ID	01-JAN-11	31-DEC-11	12	39	-0.43	100	+/- 1.88

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM

**DATA QUALITY INDICATOR REPORT**

Jun. 4, 2012

Flow Rate Verifications

**Pollutant:** PM10

**PQAO:** 1357 (Freeport McMoRan Miami, Inc.)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>Average % D</u>	<u>% Complete</u>	<u>Bias</u>
2011	09	AZ	04-007-8000	2	ID-QA	01-JAN-11	31-DEC-11	12	39	-0.66	100	+/- 1.33
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>36</b>	<b>118</b>	<b>-0.63</b>	<b>100</b>	<b>+/- 1.52</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>36</b>	<b>118</b>	<b>-0.63</b>	<b>100</b>	<b>+/- 1.52</b>

**Pollutant:** PM2.5

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

<u>Year</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u>Average % D</u>	<u>% Complete</u>	<u>Bias</u>
2011	09	AZ	04-003-1005	1	S	01-JAN-11	31-DEC-11	12	13	0.55	100	+ 1.05
2011	09	AZ	04-005-1008	1	S	01-JAN-11	31-DEC-11	12	14	0.15	100	+/- 1.12
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11	12	11	0.44	92	+/- 1.07
2011	09	AZ	04-013-9997	2	QA	01-JAN-11	30-JUN-11	6	6	12.11	100	+/- 35.05
2011	09	AZ	04-013-9997	3	PN-QA	01-JAN-11	31-DEC-11	12	11	0.39	92	+ 0.77
2011	09	AZ	04-023-0004	1	S	01-JAN-11	31-DEC-11	12	14	0.23	100	+/- 1.16
2011	09	AZ	04-023-0004	2	QA	01-JAN-11	31-DEC-11	12	13	0.08	100	+/- 0.76
2011	09	AZ	04-025-2002	1	S	01-JAN-11	31-DEC-11	12	14	-0.03	100	+/- 1.02
2011	09	AZ	04-027-8011	1	S	01-JAN-11	31-DEC-11	12	13	0.23	100	+/- 1.12
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>102</b>	<b>109</b>	<b>0.90</b>	<b>98</b>	<b>+/- 2.40</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>102</b>	<b>109</b>	<b>0.90</b>	<b>98</b>	<b>+/- 2.40</b>

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**Semi-Annual Flow Rate Audits**

**Pollutant:** LEAD

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	# Req	w/ Data	% Complete	Criteria Met?	Obs / Q				Avg %d	Flow Rate		
												Q1	Q2	Q3	Q4		Lower	Upper	% Between Conf. Limits
2011	09	AZ	04-007-1002	1	S	01-JAN-11	31-DEC-11	2	4	100	Y	1	1	1	1	-0.4			
2011	09	AZ	04-007-1002	2	S	01-JAN-11	31-DEC-11	2	4	100	Y	1	1	1	1	-0.1			
2011	09	AZ	04-007-8000	1	S	01-JAN-11	31-DEC-11	2	4	100	Y	1	1	1	1	1.1			
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>6</b>	<b>12</b>	<b>100</b>	<b>100</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>0.2</b>	<b>-8.85</b>	<b>7.67</b>	<b>100</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>6</b>	<b>12</b>	<b>100</b>	<b>100</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>0.2</b>	<b>-8.85</b>	<b>7.67</b>	<b>100</b>

**Pollutant:** PM10

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	# Req	w/ Data	% Complete	Criteria Met?	Obs / Q				Avg %d	Flow Rate		
												Q1	Q2	Q3	Q4		Lower	Upper	% Between Conf. Limits
2011	09	AZ	04-003-0011	1	S	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-1.2			
2011	09	AZ	04-003-0011	2	QA	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-0.5			
2011	09	AZ	04-003-1005	1	S	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-0.1			
2011	09	AZ	04-005-1008	1	S	01-JAN-11	31-DEC-11	2	2	100	N	0	1	0	1	1.1			
2011	09	AZ	04-007-0008	1	S	01-JAN-11	31-DEC-11	2	2	100	N	0	1	0	1	0.2			
2011	09	AZ	04-007-0008	2	QA	01-JAN-11	31-DEC-11	2	2	100	N	0	1	0	1	1.3			
2011	09	AZ	04-007-1001	3	S	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	0.9			
2011	09	AZ	04-013-8006	1	SP	01-JAN-11	30-JUN-11	1	1	100	Y	0	1	0	0	2.4			
2011	09	AZ	04-013-9997	3	S	01-JAN-11	31-DEC-11	2	1	50	N	0	1	0	0	-3.8			
2011	09	AZ	04-013-9997	4	S	01-JAN-11	31-DEC-11	2	2	100	N	0	1	0	1	0.2			
2011	09	AZ	04-015-1003	1	S	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	0.4			
2011	09	AZ	04-019-0001	3	S	01-JAN-11	31-DEC-11	2	2	100	Y	0	1	0	1	0.9			
2011	09	AZ	04-019-0020	3	S	01-JAN-11	31-DEC-11	2	2	100	Y	0	1	0	1	1.7			
2011	09	AZ	04-023-0004	1	S	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-0.9			
2011	09	AZ	04-023-0004	3	SP	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-0.4			
2011	09	AZ	04-025-2002	1	S	01-JAN-11	31-DEC-11	2	2	100	N	0	1	0	1	1.1			
2011	09	AZ	04-027-8011	3	S	01-JAN-11	31-DEC-11	2	2	100	Y	0	1	0	1	1.1			
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>33</b>	<b>32</b>	<b>97</b>	<b>65</b>	<b>7</b>	<b>10</b>	<b>7</b>	<b>8</b>	<b>0.3</b>	<b>-1.95</b>	<b>2.27</b>	<b>88</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>33</b>	<b>32</b>	<b>97</b>	<b>65</b>	<b>7</b>	<b>10</b>	<b>7</b>	<b>8</b>	<b>0.3</b>	<b>-1.95</b>	<b>2.27</b>	<b>88</b>

**Pollutant:** PM10

**PQAO:** 1357 (Freeport McMoRan Miami, Inc.)

**App A?:** Yes

Flow Rate

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Pollutant: PM10

PQAO: 1357 (Freeport McMoRan Miami, Inc.)

App A?: Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	# Req	w/ Data	% Complete	Criteria Met?	Obs / Q				Avg %d	Flow Rate		
												Q1	Q2	Q3	Q4		Lower	Upper	% Between Conf. Limits
2011	09	AZ	04-007-0009	1	ID	01-JAN-11	31-DEC-11	2	2	100	Y	0	3	0	3	-0.8			
2011	09	AZ	04-007-8000	1	ID	01-JAN-11	31-DEC-11	2	2	100	Y	0	3	0	3	-1.1			
2011	09	AZ	04-007-8000	2	ID-QA	01-JAN-11	31-DEC-11	2	2	100	Y	0	6	0	3	-1.9			
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>6</b>	<b>6</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>9</b>	<b>-1.3</b>	<b>-3.65</b>	<b>2.39</b>	<b>90</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>6</b>	<b>6</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>9</b>	<b>-1.3</b>	<b>-3.65</b>	<b>2.39</b>	<b>90</b>

Pollutant: PM2.5

PQAO: 0053 (Arizona Department Of Environmental Quality)

App A?: Yes

Year	Region	State	Site ID	POC	MT	Begin Date	End Date	# Req	w/ Data	% Complete	Criteria Met?	Obs / Q				Avg %d	Flow Rate		
												Q1	Q2	Q3	Q4		Lower	Upper	% Between Conf. Limits
2011	09	AZ	04-003-1005	1	S	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-0.3			
2011	09	AZ	04-005-1008	1	S	01-JAN-11	31-DEC-11	2	2	100	N	0	1	0	1	0.3			
2011	09	AZ	04-013-9997	1	S-NC	01-JAN-11	31-DEC-11	2	3	100	Y	1	0	1	1	-0.5			
2011	09	AZ	04-013-9997	2	QA	01-JAN-11	30-JUN-11	1	1	100	Y	0	2	0	0	7.0			
2011	09	AZ	04-013-9997	3	PN-QA	01-JAN-11	31-DEC-11	2	1	50	N	0	1	0	0	-0.2			
2011	09	AZ	04-023-0004	1	S	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-1.4			
2011	09	AZ	04-023-0004	2	QA	01-JAN-11	31-DEC-11	2	2	100	Y	1	0	1	0	-0.4			
2011	09	AZ	04-025-2002	1	S	01-JAN-11	31-DEC-11	2	2	100	N	0	1	0	1	0.0			
2011	09	AZ	04-027-8011	1	S	01-JAN-11	31-DEC-11	2	2	100	Y	0	1	0	1	-0.1			
<b>2011</b>	<b>09</b>	<b>AZ</b>	<b>SUMMARY</b>					<b>17</b>	<b>17</b>	<b>94</b>	<b>67</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>0.5</b>	<b>-12.05</b>	<b>13.85</b>	<b>100</b>
<b>SUMMARY</b>	<b>09</b>	<b>AZ</b>						<b>17</b>	<b>17</b>	<b>94</b>	<b>67</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>0.5</b>	<b>-12.05</b>	<b>13.85</b>	<b>100</b>

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**Collocation Detail**

<b>Pollutant:</b> LEAD		<b>PQAO:</b> 0053 (Arizona Department Of Environmental Quality)										<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>Parameter Code</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u># Valid</u>	<u>% Complete</u>	<u>CV</u>
2011		09	AZ	04-007-1002	14129	1	S	01-JAN-11	31-DEC-11	30	50	40	100	7.65
<b>Pollutant:</b> PM10		<b>PQAO:</b> 0053 (Arizona Department Of Environmental Quality)										<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>Parameter Code</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u># Valid</u>	<u>% Complete</u>	<u>CV</u>
2011		09	AZ	04-003-0011	81102	1	S	01-JAN-11	31-DEC-11	30	49	46	100	14.27
2011		09	AZ	04-007-0008	81102	1	S	01-JAN-11	31-DEC-11	30	55	54	100	8.51
<b>Pollutant:</b> PM10		<b>PQAO:</b> 1357 (Freeport McMoRan Miami, Inc.)										<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>Parameter Code</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u># Valid</u>	<u>% Complete</u>	<u>CV</u>
2011		09	AZ	04-007-8000	81102	1	ID	01-JAN-11	31-DEC-11	30	12	12	40	8.37
<b>Pollutant:</b> PM2.5		<b>PQAO:</b> 0053 (Arizona Department Of Environmental Quality)										<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u>Site ID</u>	<u>Parameter Code</u>	<u>POC</u>	<u>MT</u>	<u>Begin Date</u>	<u>End Date</u>	<u># Req</u>	<u># Obs</u>	<u># Valid</u>	<u>% Complete</u>	<u>CV</u>
2011	143	09	AZ	04-013-9997	88101	1	S-NC	02-JUL-11	29-DEC-11	15	60	60	100	14.53
2011	143	09	AZ	04-023-0004	88101	1	S	03-JAN-11	29-DEC-11	30	54	52	100	14.91
2011	145	09	AZ	04-013-9997	88101	1	S-NC	03-JAN-11	29-JUN-11	14	97	91	100	12.84

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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**Collocation Summary**

<b>Pollutant:</b> LEAD		<b>PQAO:</b> 0053 (Arizona Department Of Environmental Quality)								<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u># Sites</u>	<u># Collocated</u>	<u># Actually Collocated</u>	<u>% Req. Sites</u>	<u># Req</u>	<u># Obs</u>	<u># Valid Obs</u>	<u>% Complete</u>	<u>CV</u>
2011		09	AZ	2	1	1	100	30	50	40	100	7.65
<b>SUMMARY</b>		09	AZ				100			40	100	7.65
<b>Pollutant:</b> PM10		<b>PQAO:</b> 0053 (Arizona Department Of Environmental Quality)								<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u># Sites</u>	<u># Collocated</u>	<u># Actually Collocated</u>	<u>% Req. Sites</u>	<u># Req</u>	<u># Obs</u>	<u># Valid Obs</u>	<u>% Complete</u>	<u>CV</u>
2011		09	AZ	13	2	2	100	60	104	100	100	11.00
<b>SUMMARY</b>		09	AZ				100			100	100	11.00
<b>Pollutant:</b> PM10		<b>PQAO:</b> 1357 (Freeport McMoRan Miami, Inc.)								<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u># Sites</u>	<u># Collocated</u>	<u># Actually Collocated</u>	<u>% Req. Sites</u>	<u># Req</u>	<u># Obs</u>	<u># Valid Obs</u>	<u>% Complete</u>	<u>CV</u>
2011		09	AZ	2	1	1	100	30	12	12	40	8.37
<b>SUMMARY</b>		09	AZ				100			12	40	8.37
<b>Pollutant:</b> PM2.5		<b>PQAO:</b> 0053 (Arizona Department Of Environmental Quality)								<b>App A?:</b> Yes		
<u>Year</u>	<u>Method</u>	<u>Region</u>	<u>State</u>	<u># Sites</u>	<u># Collocated</u>	<u># Actually Collocated</u>	<u>% Req. Sites</u>	<u># Req</u>	<u># Obs</u>	<u># Valid Obs</u>	<u>% Complete</u>	<u>CV</u>
2011	143	09	AZ	6	1	2	100	30	114	112	100	14.81
2011	145	09	AZ	1	1	1	100	30	97	91	100	12.84
2011	170	09	AZ	1	1	0	0	30	0	0	0	
2011	<b>SUMMARY</b>	09	AZ				67			203	67	13.53
<b>SUMMARY</b>		09	AZ				67			203	67	13.53

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**Performance Evaluation Program (PEP)**

**Pollutant:** LEAD

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	# Sites	#PEP	# PEP	# Collocated	# Collocated	%	Bias	Conf. Limits	
				Required	Collected	PEP Req	PEP Coll.			Complete	Lower
2011	09	AZ	2	1	0	4	0	0			
<b>SUMMARY</b>	09	AZ						0			

**Pollutant:** PM2.5

**PQAO:** 0053 (Arizona Department Of Environmental Quality)

**App A?:** Yes

Year	Region	State	# Sites	#PEP	# PEP	# Collocated	# Collocated	%	Bias	Conf. Limits	
				Required	Collected	PEP Req	PEP Coll.			Complete	Lower
2011	09	AZ	6	8	7	0	0	88	- 10.70	-26.96	5.56
<b>SUMMARY</b>	09	AZ						88	- 10.70	-26.96	5.56

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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Audit Strip Analysis

Pollutant: LEAD

PQAO: 0053 (Arizona Department Of Environmental Quality)

App A?: Yes

Year	Region	State	Lab Id	% Completeness				Year	Bias	
				Q1	Q2	Q3	Q4			
2011	09	AZ	1394	100	100	100	100	100	+/-	4.02
<b>SUMMARY</b>	09	AZ	1394	100	100	100	100	100	+/-	4.02

## **Appendix G – ADEQ PM<sub>2.5</sub> Sampling Frequency Clarifications and Request for Sampling Frequency Reductions**

This Appendix contains a copy of the letter from ADEQ to the EPA clarifying and requesting PM<sub>2.5</sub> sampling frequency deviations from the CFR.



Janice K. Brewer  
Governor

# ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007  
(602) 771-2300 • www.azdeq.gov



Henry R. Darwin  
Director

July 11, 2012

Deborah Jordan, Air Division Director  
U.S. Environmental Protection Agency, Region 9  
Air-1  
75 Hawthorne Street  
San Francisco, CA 94105

SUBJECT: ADEQ PM<sub>2.5</sub> sampling frequency clarifications and request for sampling frequency reductions

Dear Ms. Jordan:

The Arizona Department of Environmental Quality has been operating most PM<sub>2.5</sub> filter-based monitors on a 1-in-6 sampling schedule since the start of the PM<sub>2.5</sub> ambient monitoring program. Recently, in response to ADEQ's 2011 Ambient Air Quality Monitoring Network Plan, EPA Region 9 recommended that all PM<sub>2.5</sub> sites operate at the required 1-in-3 sampling schedule. While this sampling schedule would be required for some sites that are labeled as SLAMS sites without a collocated continuous PM<sub>2.5</sub> instrument, 40 CFR 58.12(1)(ii) states that the EPA Regional Administrator may grant sampling frequency reductions for sites that are not SLAMS sites or are collocated with a continuous PM<sub>2.5</sub> instrument. The sites that meet these criteria and are eligible for sample frequency reduction include Nogales Post Office, Flagstaff Middle School, Yuma Supersite, and Prescott Valley. Sites that are not eligible for a sample frequency reduction include Douglas Red Cross and JLG Supersite. The JLG Supersite filter-based PM<sub>2.5</sub> sampler operates on the required 1-in-3 sampling schedule; therefore no change in the sample frequency is being requested for this site. Along with all other PM<sub>2.5</sub> sites operated by ADEQ, the Douglas Red Cross PM<sub>2.5</sub> monitor operates on a 1-in-6 sample schedule. As discussed below, ADEQ is requesting a continuation of the 1-in-6 sample schedule for Douglas Red Cross until a continuous PM<sub>2.5</sub> FEM monitor can be installed.

## Nogales and Douglas

Ambient PM<sub>2.5</sub> concentration data at Nogales Post Office support enhanced monitoring due to its proximity to the PM<sub>2.5</sub> NAAQS. A non-FEM continuous PM<sub>2.5</sub> instrument has been operating since 2005 which characterizes the diurnal and seasonal patterns quite well. ADEQ believes operating the filter-based PM<sub>2.5</sub> sampler on a 1-in-6 sampling schedule in conjunction with the continuous PM<sub>2.5</sub> sampler provides a solid characterization of PM<sub>2.5</sub> concentrations in Nogales. However, ADEQ recognizes that the Nogales Post Office site is an extremely important site for particulate monitoring and as a result, plans to install a continuous PM<sub>2.5</sub> FEM monitor using new 103 funds. ADEQ anticipates purchasing two continuous PM<sub>2.5</sub> FEM monitors by March,

Southern Regional Office  
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(520) 628-6733

2013. The second continuous PM<sub>2.5</sub> FEM monitor would be installed at the Douglas Red Cross site. Until these monitors are installed, ADEQ requests that the sampling frequency at Nogales and Douglas remain on the 1-in-6 sampling schedule.

#### Flagstaff

The Flagstaff Middle School PM<sub>2.5</sub> monitor is labeled as a SLAMS monitor and has been in operation since the PM<sub>2.5</sub> program began in 1999. ADEQ also operates a PM<sub>10</sub> filter-based sampler at this site. Both samplers operate on the 1-in-6 sample schedule. ADEQ has also operated a continuous EBAM monitor at this site since 2007. In 2011, the EBAM monitor's configuration was changed to collect PM<sub>2.5</sub> instead of the previous configuration of PM<sub>10</sub>. Both PM<sub>10</sub> and PM<sub>2.5</sub> concentrations have been very low throughout the ambient monitoring history in Flagstaff. As a result, ADEQ may re-evaluate the need for filter-based PM samplers in the Flagstaff area. Until then, ADEQ is requesting EPA approval to maintain a 1-in-6 sample schedule for the PM<sub>2.5</sub> filter-based monitor given the current collocation with a continuous PM<sub>2.5</sub> EBAM monitor.

#### Yuma and Prescott Valley

The Yuma and Prescott Valley PM<sub>2.5</sub> monitors were installed in 2008 as special purpose monitors (SPM) to evaluate PM<sub>2.5</sub> concentrations in their respective areas. ADEQ has mistakenly labeled these PM<sub>2.5</sub> filter-based samplers as SLAMS monitors in previous network plans. Due to their true designation as SPMs, ADEQ is requesting EPA approval to continue to operate the Yuma Supersite and Prescott Valley PM<sub>2.5</sub> samplers on a 1-in-6 sampling schedule.

Similar to the PM sampling configuration in Flagstaff, the Prescott Valley site also contains a PM<sub>10</sub> filter-based monitor in addition to the PM<sub>2.5</sub> filter-based sampler. The Prescott Valley PM<sub>10</sub> monitor was established in 1999 as a SLAMS monitor. ADEQ has also operated a continuous EBAM monitor at the Prescott College AQD site since 2007. Both PM<sub>10</sub> and PM<sub>2.5</sub> concentrations have been very low throughout the ambient monitoring history in Prescott Valley. As a result, ADEQ may re-evaluate the need for filter-based PM samplers in the Prescott Valley area. Until then, ADEQ is requesting EPA approval to maintain a 1-in-6 sample schedule for the PM<sub>2.5</sub> filter-based monitor given the SPM status and nearby continuous PM<sub>2.5</sub> EBAM monitor at the Prescott College AQD site.

While not required, ADEQ is currently evaluating the possibility of installing a continuous PM<sub>2.5</sub> FEM monitor in Yuma. Until ADEQ is able to fully evaluate this, taking into consideration available funds, ADEQ is requesting EPA approval to maintain a 1-in-6 sample schedule for the Yuma Supersite PM<sub>2.5</sub> filter-based monitor given the SPM status.

ADEQ is committed to meeting the PM<sub>2.5</sub> monitoring requirements set forth in 40 CFR 58.12. If you have any questions related to this request, please contact me at (602) 771-2308 or Theresa Rigney, Air Quality Assessment Manager, at (602) 771-2274.

Sincerely,



Eric C. Massey, Director  
Air Quality Division

cc: Matthew Lakin, USEPA, Region 9  
Michael Flagg, USEPA, Region 9  
Theresa Rigney, ADEQ

## **Appendix H – Proposed Changes to SO<sub>2</sub> and PM<sub>10</sub> Networks in Miami and Hayden, AZ**

This Appendix contains a copy of the letter from ADEQ to EPA regarding proposed changes to SO<sub>2</sub> and PM<sub>10</sub> monitoring in the towns of Miami and Hayden, Arizona.



Janice K. Brewer  
Governor

# ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007  
(602) 771-2300 • [www.azdeq.gov](http://www.azdeq.gov)



Henry R. Darwin  
Director

July 11, 2012

Deborah Jordan, Air Division Director  
U.S. Environmental Protection Agency, Region 9  
Air-1  
75 Hawthorne Street  
San Francisco, CA 94105

SUBJECT: Proposed Changes to SO<sub>2</sub> and PM<sub>10</sub> Networks in Miami and Hayden, AZ

Dear Ms. Jordan:

In response to findings in recent EPA Region 9 Technical System Audits (TSA) and a general effort by the Arizona Department of Environmental Quality (ADEQ) to streamline ambient air quality monitoring and data reporting throughout the state, ADEQ is proposing monitoring changes in the Miami, AZ area and requesting approval from EPA Region 9. This area is considered non-attainment and maintenance for the PM<sub>10</sub> and SO<sub>2</sub> NAAQS, respectively. As a result, there are SIP commitments to continue monitoring for these pollutants in the area. Historically, Freeport McMoRan Copper and Gold Inc. (hereinafter referred to as Freeport McMoRan) has been responsible for much of the ambient air quality monitoring in the area, with ADEQ only operating one SO<sub>2</sub> monitor at the Miami Ridgeline site and a TSP-Lead monitor at the Miami Golf Course site. Freeport McMoRan operates SO<sub>2</sub> monitors at the Jones Ranch and Miami Townsite sites as well as PM<sub>10</sub> monitors at the Miami Ridgeline and Miami Golf Course sites. Currently, only the data from the Ridgeline and Golf Course sites have been regularly entered into EPA's AQS database. While Freeport McMoRan has recently begun to supply hourly SO<sub>2</sub> data to ADEQ, there remain some hurdles in place that are preventing the SO<sub>2</sub> data from being loaded to AQS in a timely manner.

ADEQ has begun negotiations with Freeport McMoRan to collocate SO<sub>2</sub> monitors at their Jones Ranch and Miami Townsite sites. ADEQ plans to report data from these collocated monitors to the EPA AQS database on a routine basis in accordance with current data reporting practices. Additionally, ADEQ plans to begin operating a continuous PM<sub>10</sub> instrument at the Miami Golf Course site. All of these data would be reported to EPA's AQS database so that compliance with the NAAQS can be easily monitored and evaluated. While ADEQ intends to take on these additional monitoring responsibilities in Miami, AZ, ADEQ is proposing that the Miami Ridgeline site be discontinued as the maximum concentration sites are Jones Ranch and Miami Golf Course for SO<sub>2</sub> and PM<sub>10</sub>, respectively, and the population exposure sites would be covered by the Miami Townsite and Miami Golf Course sites. Please see the attached document for details on the spatial distribution of these sites throughout the Miami, AZ area, as well as data summaries that justify the removal of the Miami Ridgeline site. ADEQ acknowledges that the

Southern Regional Office  
400 West Congress Street • Suite 433 • Tucson, AZ 85701  
(520) 628-6733

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discontinuation of the Miami Ridgeline site would likely require a SIP revision for the Miami area SIPs, a process that ADEQ is willing to undertake.

ADEQ intends to make these changes in increments, with the Miami Golf Course PM<sub>10</sub> TEOM monitor being the first to be installed and the removal of the Miami Ridgeline monitors being the last to occur. The SO<sub>2</sub> network changes may take additional time to implement and the exact time frame for the completion of these changes is not known. As a first step, ADEQ requests EPA approval of the monitoring network changes discussed above in the Miami, AZ area. Specifically and most notably, ADEQ is requesting EPA concurrence that the Jones Ranch, Miami Townsite, and Miami Golf Course monitors are suitable replacements for the Miami Ridgeline monitors. If approved, ADEQ will pursue a SIP revision and ensure that the removal of monitors at Miami Ridgeline will occur after all other monitors are installed and fully operational.

ADEQ has also initiated discussions with ASARCO LLC to discuss similar changes for the SO<sub>2</sub> monitoring network in Hayden, AZ. More details will be provided as they become available. ADEQ is committed to meeting the PM<sub>10</sub> and SO<sub>2</sub> monitoring and quality assurance requirements set forth in 40 CFR 58.12. If you have any questions related to this request, please contact me at (602) 771-2308 or Theresa Rigney, Air Quality Assessment Manager, at (602) 771-2274.

Sincerely,



Eric C. Massey, Director  
Air Quality Division

Enclosure

cc: Matthew Lakin, USEPA, Region 9  
Michael Flagg, USEPA, Region 9  
Diane Arnst, ADEQ  
Theresa Rigney, ADEQ

## Justification for ADEQ SO<sub>2</sub> and PM<sub>10</sub> Proposed Network Changes in Miami, AZ

### Jones Ranch (new SO<sub>2</sub>)

ADEQ would install an SO<sub>2</sub> monitor to collocate with Freeport's existing SO<sub>2</sub> monitor at the Jones Ranch site which has the maximum SO<sub>2</sub> concentrations in the Miami area.

### Miami Ridgeline (remove SO<sub>2</sub> and Freeport PM<sub>10</sub>)

ADEQ and Freeport McMoRan would remove SO<sub>2</sub> and PM<sub>10</sub> monitors, respectively, as SO<sub>2</sub> and PM<sub>10</sub> measurements at Miami Ridgeline are the lowest in the network (based on design values). Under this proposal, the Miami Ridgeline site would be closed entirely.

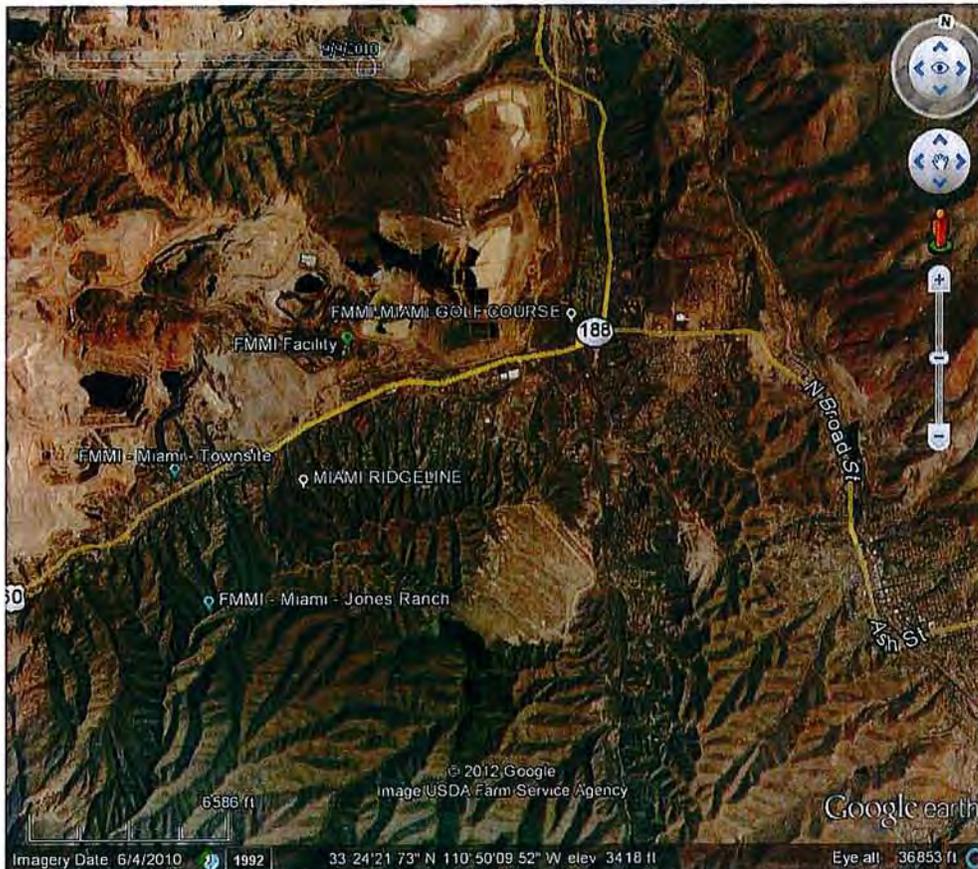
### Miami Townsite (new SO<sub>2</sub>)

ADEQ would install an SO<sub>2</sub> monitor to collocate with Freeport's existing SO<sub>2</sub> monitor. This site is the SO<sub>2</sub> maximum concentration population exposure site for the Miami area.

### Miami Golf Course (new PM<sub>10</sub>)

ADEQ would install a PM<sub>10</sub> monitor to either replace or collocate with Freeport's existing PM<sub>10</sub> monitor. ADEQ also operates a Hi Volume Pb sampler at this site. Miami Golf Course is the maximum concentration site for PM<sub>10</sub> in the area.

## Spatial Distribution of Miami Area Air Quality Monitors



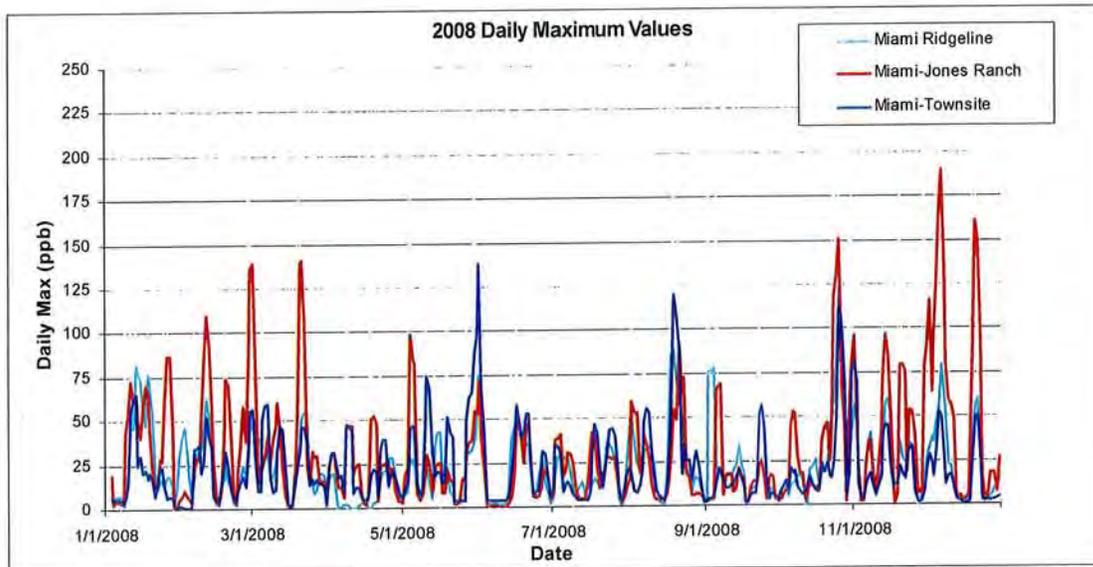
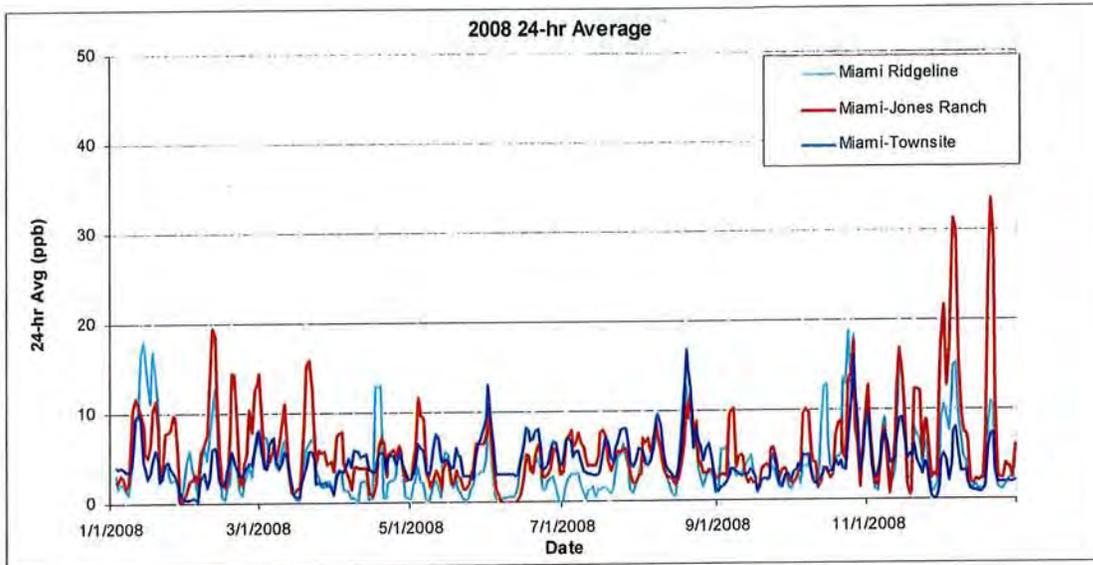
### PM<sub>10</sub> Data Summary for Miami Area Sites

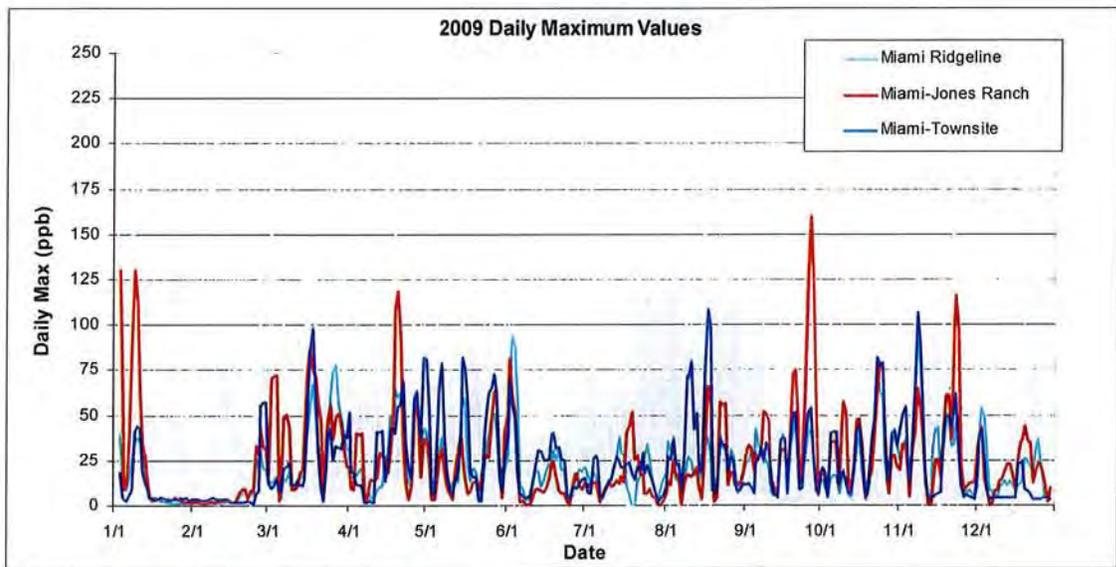
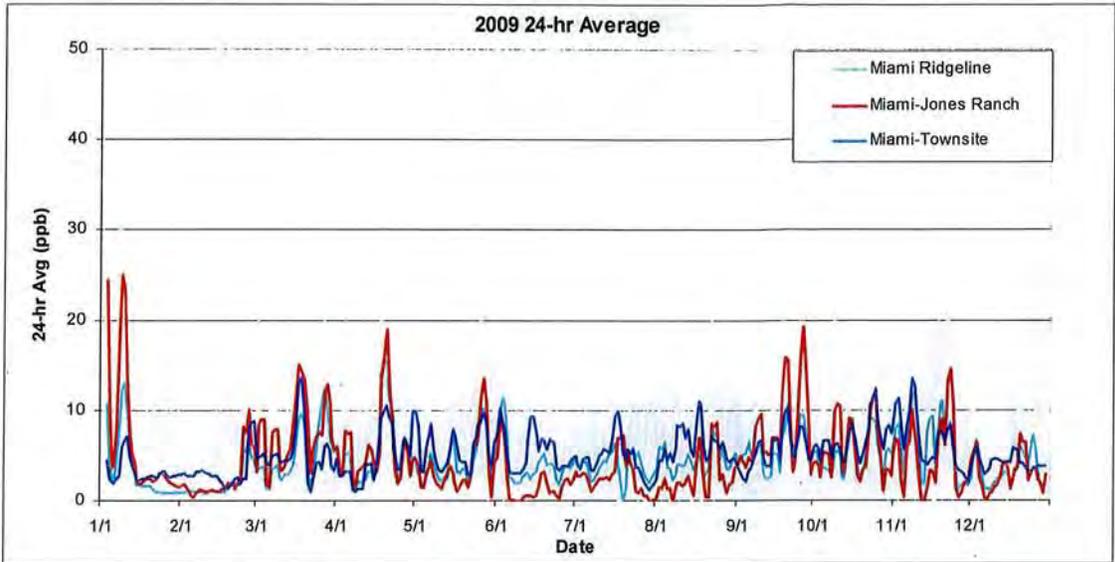
	Miami Ridgeline	Miami Golf Course
2008 Annual Average	12.9	18.2
2009 Annual Average	12.1	18.1
2010 Annual Average	10.4	15.8
2008 95 <sup>th</sup> Percentile	26	35
2009 95 <sup>th</sup> Percentile	25	31
2010 95 <sup>th</sup> Percentile	17	26
2008 Maximum Value	42	46
2009 Maximum Value	64	31
2010 Maximum Value	20	26

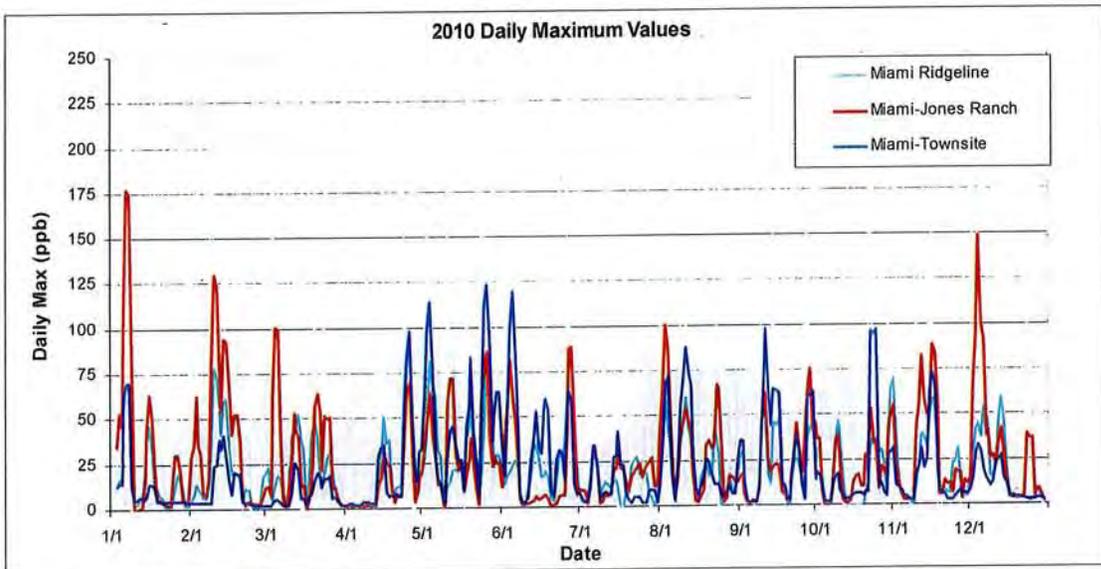
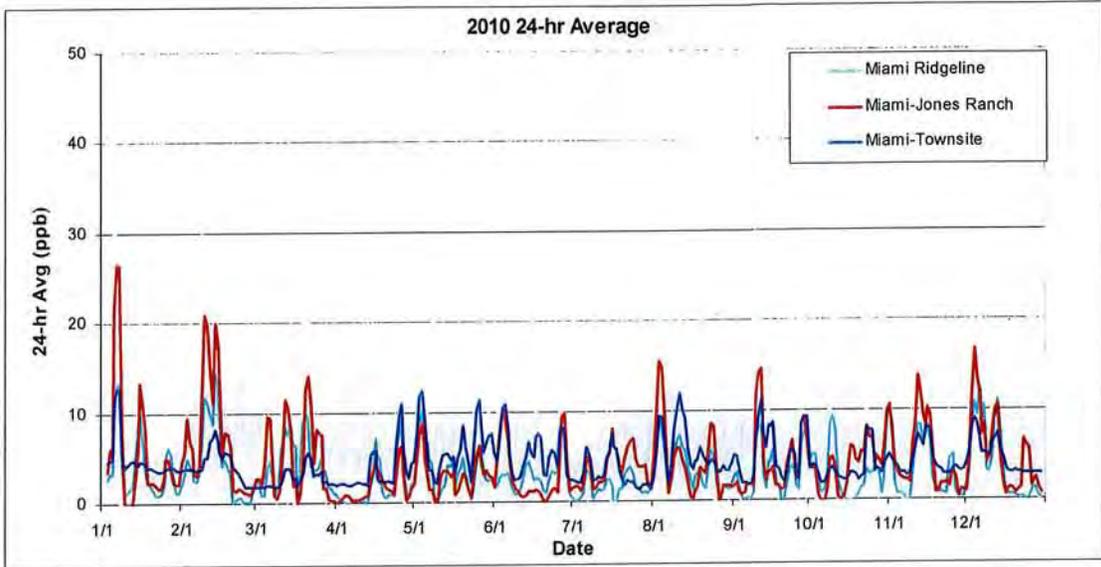
## SO<sub>2</sub> Data Summary for Miami Area Sites

Year	Percentile	24-hr Average			Daily Maximum Values (gray are the annual design values)		
		MIAMI RIDGELINE (ppb)	MIAMI - JONES RANCH (ppb)	MIAMI - TOWNSITE (ppb)	MIAMI RIDGELINE (ppb)	MIAMI - JONES RANCH (ppb)	MIAMI - TOWNSITE (ppb)
2008	10	0.4	1.1	1.2	1.0	2.0	2.0
	25	1.0	2.0	2.5	3.0	3.0	4.0
	50	2.3	3.5	3.5	14.0	10.0	9.0
	75	5.4	7.7	5.5	33.0	43.0	28.0
	90	10.7	14.4	9.0	63.6	92.8	65.0
	95	14.5	19.0	10.8	80.3	136.4	87.0
	99	23.3	32.1	15.4	124.2	225.5	154.6
2009	10	1.2	0.2	2.3	2.0	1.0	3.0
	25	1.9	1.2	3.0	4.0	3.0	4.0
	50	3.1	2.6	4.1	13.0	9.0	8.0
	75	6.0	5.5	6.2	33.0	33.0	31.0
	90	10.7	12.5	10.5	59.0	77.6	69.8
	95	13.2	18.9	12.7	77.2	113.8	105.7
	99	17.0	26.0	16.4	111.8	188.0	142.8
2010	10	0.0	0.1	2.0	1.0	1.0	2.0
	25	0.7	0.8	2.3	2.0	2.0	3.0
	50	1.6	2.0	3.5	10.0	7.0	6.0
	75	4.8	5.3	5.1	33.3	39.0	21.0
	90	9.1	11.3	8.5	64.3	81.2	62.6
	95	12.8	16.5	11.6	84.3	115.0	103.6
	99	18.9	27.0	17.8	122.1	188.7	172.7

## Ridgeline, Jones Ranch, and Townsite 24-hour and daily hourly maximum SO<sub>2</sub> Comparisons







## **Appendix I – Criteria Pollutant Minimum Monitoring Requirements**

This appendix contains tables that summarize the criteria pollutant minimum monitoring requirements for each MSA or CBSA that ADEQ is designated as the Primary Quality Assurance Organization (PQAO). Minimum monitoring requirements for the Phoenix-Mesa-Scottsdale and Tucson MSAs are not included within this appendix as ADEQ is not the PQAO for these MSAs.

**O<sub>3</sub>**

(Note: Refer to section 4.1 and Table D-2 of Appendix D to 40 CFR Part 58)

Table 1. Minimum Monitoring Requirements for O<sub>3</sub>.

MSA	County	2010 Census Population	2009-2011 8-hr Design Value (ppb)	Design Value Site	# of Required Monitors	# of Active Monitors	# of Additional Monitors Needed
Flagstaff	Coconino	134,421	67	Flagstaff Middle School	1	1	0
Prescott	Yavapai	211,033	66	Prescott College AQD	1	1	0
Yuma	Yuma	195,751	73	Yuma Supersite	1	1	0
Lake Havasu-Kingman	Mohave	200,186	NA	NA	0	0	0

Monitors required for SIP or Maintenance Plan: Alamo Lake, JLG Supersite, Queen Valley, and Tonto National Monument.

**PM<sub>2.5</sub>**

(Note: Refer to sections 4.7.1, 4.7.2 and Table D-5 of Appendix D to 40 CFR Part 58)

Table 2a. Minimum Monitoring Requirements for PM<sub>2.5</sub> SLAMS. (FRM/FEM/ARM, see 40CFR 58 App D Section 4.7.1 and Table D-5)

MSA	County	2010 Census Population	2009-2011 Annual Design Value (µg/m <sup>3</sup> )	Annual Design Value Site	2009-2011 Daily Design Value (µg/m <sup>3</sup> )	Daily Design Value Site	# of Required SLAMS Monitors	# of Active SLAMS Monitors	# of Additional SLAMS Monitors Needed
Flagstaff	Coconino	134,421	5.9	Flagstaff Middle School	14	Flagstaff Middle School	0	1	0
Prescott	Yavapai	211,033	4.3	Prescott Valley	10	Prescott Valley	0	1	0
Yuma	Yuma	195,751	7.5	Yuma Supersite	15	Yuma Supersite	0	1	0
Lake Havasu-Kingman	Mohave	200,186	NA	NA	NA	NA	0	0	0

Table 2b. Minimum Monitoring Requirements for continuous PM<sub>2.5</sub> monitors. (FEM/ARM and non-FEM, see 40CFR 58 App D Section 4.7.2)

MSA	County	2010 Census Population	2009-2011 Annual Design Value (µg/m <sup>3</sup> )	Annual Design Value Site	2009-2011 Daily Design Value (µg/m <sup>3</sup> )	Daily Design Value Site	# of Required Continuous Monitors	# of Active Continuous Monitors	# of Additional Continuous Monitors Needed
Flagstaff	Coconino	134,421	5.9	Flagstaff Middle School	14	Flagstaff Middle School	0	1*	0
Prescott	Yavapai	211,033	4.3	Prescott Valley	10	Prescott Valley	0	1*	0
Yuma	Yuma	195,751	7.5	Yuma Supersite	15	Yuma Supersite	0	0	0
Lake Havasu-Kingman	Mohave	200,186	NA	NA	NA	NA	0	0	0

\* Continuous monitors are not FRMs, FEMS, or ARMs

Monitors required for SIP or Maintenance Plan: Nogales Post Office.

**PM<sub>10</sub>**

(Note: Refer to section 4.6 and Table D-4 of Appendix D to 40 CFR Part 58)

Table 3. Minimum Monitoring Requirements for PM<sub>10</sub>.

MSA	County	2010 Census Population	2009-2011 Max Concentration [µg/m <sup>3</sup> ]	Max Concentration Site	# of Required Monitors	# of Active Monitors	# of Additional Monitors Needed
Flagstaff	Coconino	134,421	61	Flagstaff Middle School	0	1	0
Prescott	Yavapai	211,033	90	Prescott Valley	0	1	0
Yuma	Yuma	195,751	306	Yuma Supersite	1-2	1	0
Lake Havasu-Kingman	Mohave	200,186	132	Bullhead City	0-1	1	0

Monitors required for SIP or Maintenance Plan: Ajo, Bullhead City, Douglas Red Cross, Hayden Old Jail, JLG Supersite, Miami Golf Course, Miami Ridgeline, Nogales Post Office, Paul Spur Chemical Lime Plant, Payson Well Site, Rillito, and Yuma Supersite.

**NO<sub>2</sub>**

(Note: Refer to section 4.3 of Appendix D to 40 CFR Part 58)

Table 4. Minimum Monitoring Requirements for NO<sub>2</sub>.

CBSA	2010 Census Population	2009 Max AADT Counts	# of Required Near-road Monitors	# of Active Near-road Monitors	# of Additional Near-road Monitors Needed	# of Required Area-wide Monitors	# of Active Area-wide Monitors	# of Additional Area-wide Monitors Needed
Flagstaff	134,421	40,500	0	0	0	0	0	0
Prescott	211,033	38,000	0	0	0	0	0	0
Yuma	195,751	37,000	0	0	0	0	0	0
Lake Havasu – Kingman	200,186	34,500	0	0	0	0	0	0

Monitors required for SIP or Maintenance Plan: None

Monitors required for PAMS: JLG Supersite

EPA Regional Administrator-required monitors per 40 CFR 58, App. D 4.3.4: None

**SO<sub>2</sub>**

(Note: Refer to section 4.4 of Appendix D to 40 CFR Part 58)

Table 5. Minimum Monitoring Requirements for SO<sub>2</sub>.

CBSA	County	2010 Census Population	2008 Total SO <sub>2</sub> <sup>1</sup> [tons/year]	Population Weighted Emissions Index <sup>2</sup> [million persons-tons per year]	# of Required Monitors	# of Active Monitors	# of Additional Monitors Needed
Flagstaff	Coconino	134,421	539	70	0	0	0
Prescott	Yavapai	211,033	2272	490	0	0	0
Yuma	Yuma	195,751	185	36	0	0	0
Lake Havasu – Kingman	Mohave	200,186	319	62	0	0	0

<sup>1</sup>Using NEI data<sup>2</sup>Calculated by multiplying CBSA population and total SO<sub>2</sub> and dividing product by one million

Monitors required for SIP or Maintenance Plan: Hayden Old Jail and Miami Ridgeline.

EPA Regional Administrator-required monitors per 40 CFR 58, App. D 4.4.3: None

**CO**

(Note: Refer to section 4.2 of Appendix D to 40 CFR Part 58)

Table 6. Minimum Monitoring Requirements for CO.

CBSA	2010 Census Population	# of Required Near-Road Monitors	# of Active Near-Road Monitors	# of Additional Monitors Needed
Flagstaff	134,421	0	0	0
Prescott	211,033	0	0	0
Yuma	195,751	0	0	0
Lake Havasu – Kingman	200,186	0	0	0

Monitors required for SIP or Maintenance Plan: JLG Supersite

EPA Regional Administrator-required monitors per 40 CFR 58, App.D 4.2.2: None

**Pb**

(Note: Refer to section 4.5 of Appendix D to 40 CFR Part 58)

Table 7a. Minimum Monitoring Requirements for Pb at NCore.

NCore Site	CBSA	2010 Census Population	# of Required Monitors	# of Active Monitors	# of Additional Monitors Needed
JLG Supersite	Phoenix–Mesa–Scottsdale	4,192,887	1	1	0

Table 7b. Source-Oriented Pb Monitoring (including airports)

Source Name	Address	Pb Emissions (tons per year)	Emission Inventory Source & Data Year	Max 3-Month Design Value* [ $\mu\text{g}/\text{m}^3$ ]	Design Value Date (third month, year)	# of Required Monitors	# of Active Monitors	# of Additional Monitors Needed
ASARCO LLC	--	3.85	ADEQ 2010	0.27	June, 2011	1	1	0
Freeport McMoRan Copper and Gold Inc.	--	3.67	ADEQ 2010	0.06	May, 2011	1	1	0

\*consider data from the past 3 years.

Monitors required for SIP or Maintenance Plan: None

EPA Regional Administrator-required monitors per 40 CFR 58, App. D 4.5(c): None