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2016 AIR MONITORING NETWORK PLAN

Final

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ACKNOWLEDGEMENTS

In 2016, the Maricopa County Air Quality Department's Air Monitoring Division maintained 26 ambient air monitoring sites throughout Maricopa County. The division has nineteen team members including: one manager, one quality assurance officer, two technician supervisors, one engineer, one data analyst, one database assistant, and twelve technicians.

The division would especially like to thank all of its personnel and the department's atmospheric scientist for their excellent job in helping to maintain Maricopa County's air monitoring program. They are: Ben Davis, Gary Ensminger, Robert Dyer, Reynaldo Santillano, John Neff, Ceresa Stewart, Nikki Peterson, Tom Shorb, Chris Hernandez, Steve Sample, Daniel Daniels, Robert Sawicki, Larry Seals, Alex Herrera, Freddie Alejandro, Tom Dubishar, David Dubiel, Jose Bravo, Andy Clifton and Ron Pope, respectfully.

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Last, we would like to thank the United States Environmental Protection Agency's Region 9 personnel for their guidance and support regarding our air monitoring program. The department respectfully submits this 2016 Air Monitoring Network Plan to Region 9 for review.

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ABSTRACT

In 2016, the Maricopa County Air Quality Department (MCAQD) Air Monitoring Division (AMD) successfully operated a robust air quality surveillance system that monitored for regulated ambient air pollutants as per *40 CFR Parts 50 and 58*. This Annual Monitoring Network Plan (AMNP) documents how the system performed during 2016. The air monitoring data produced are intended for regulatory compliance determinations regarding six regulated ambient air pollutants.

The plan covers changes made to the air monitoring network in 2016, and it provides supporting information for those changes. In 2016, there were no request waivers from air monitoring regulations. The MCAQD informs personnel at the Environmental Protection Agency's Region 9 (EPA R9) office of any significant data collection interruptions immediately. In 2016, air monitoring was suspended at one site due to inaccessibility. The Higley site remained closed due to the need to relocate the monitoring station's physical location. The build-out and move was not completed by the end of 2016 as hoped, but in early 2017.

During 2016, some notable accomplishments were:

- performing specialized particulate air monitoring for chemical speciation from the 2016 Thanksgiving through the 2017 New Year's holiday season; and,
- assisting the Fort McDowell Yavapai Nation by temporarily loaning air monitors to prevent PM₁₀ and O₃ data interruption.

Department personnel maintained successful working relationships with regulatory agency representatives, customers, and stakeholders. We provided our data to persons from these groups as requested, and we responded to calls from the public regarding air monitoring questions. We maintained our air monitoring website for the public's benefit as well as data reporting to AirNow.

INTRODUCTION TO THE AIR MONITORING NETWORK PLAN

Each year, MCAQD produces a comprehensive Air Monitoring Network Plan (AMNP) that provides vital information regarding the air monitoring surveillance system operating within Maricopa County. The plan addresses the EPA's requirements for operating the surveillance system as per *40 CFR Part 58 - Ambient Air Quality Surveillance*. As per *40 CFR Part 58, Subpart B §58.10(a)(1)*, the EPA requires each air monitoring organization (MO) operating within the U.S. and its territories to develop and submit an annual plan by July 1st following a 30-day public comment period.

The plan is complementary to the annual data certification process. It helps us continuously review, assess, and improve how well the county's air monitoring surveillance system, or network, is performing. The plan informs the public, EPA, and other MOs of potential changes to the monitoring network. The design and performance of an ambient air monitoring network and data certification process are covered by the regulatory requirements found in *40 CFR Part 58 - Subpart A (general provisions), Subpart B (monitoring network), Subpart C (special purpose monitors (SPM)), Subpart D (comparability of ambient data national ambient air quality standards (NAAQS)), Subpart F (air quality index reporting), and Subpart G (federal monitoring)*. Last, it provides information regarding exceedances and violations of the NAAQS for the six regulated pollutants.

Additionally, the plan helps improve the public's knowledge of local air pollution concerns. It describes our reporting of near-real time pollutant data to the public via our website, which helps people avoid exposure to elevated pollution levels by altering their daily activities.

The MCAQD's monitoring network is comprised of six "criteria pollutant" (CP) subnetworks and 26 monitoring sites at the beginning of 2016. The AMNP includes an abundance of information including metadata for each monitoring site and a summary of the CP data produced in 2016. Fundamental information regarding how well each monitor's siting and operation met applicable regulatory requirements is included.

Furthermore, the plan addresses other regulatory requirements found in *40 CFR Part 58, Subpart G - Appendix A (quality assurance requirements for state and local air monitoring stations (SLAMS), Appendix C (ambient air quality monitoring methodology), Appendix D (network design criteria for ambient air quality monitoring), and Appendix E (uniform air quality index (AQI) and daily reporting)*. The plan's information includes, but is not limited to:

- Detailed descriptions of the air monitoring sites and the monitoring conducted at each;
- The quality and suitability of comparing the CP data to the NAAQS;
- Design value criteria, which are metrics used to determine how many pollutant monitors are required to operate within each CP network;
- Three years of CP data from each monitor and required statistical analyses;
- How MCAQD plans to review and address a violating monitor;
- Proposed changes to sites and/or monitors within the next 18 months;
- Any proposed changes to the monitoring or analytical methods;
- Brief information regarding special purpose and/or research-driven air monitoring, if conducted;
- Any requests for waivers from specific air monitoring requirements; and
- Public comments received regarding the final draft AMNP and MCAQD's response to the comments.

Each year, the MCAQD solicits public comments on the final draft AMNP. Following the 30-day public comment period, the MCAQD amends the final draft as needed. Then, the final AMNP is submitted to EPA R9 for review and approval. The EPA R9 completes the review process within 120 days of receiving the plan, and the EPA R9 Administrator, or their representative, must approve the requests for network changes and waivers. If EPA does not approve the plan, then the MCAQD addresses the concerns presented by EPA R9 personnel and submits a revised plan. Once the plan is approved, MCAQD posts it on our website and the EPA makes it available to other MOs through the EPA's [Ambient Monitoring Technology Information Center \(AMTIC\) website](#).

Figure 1 shows the location of MCAQD's air monitoring sites discussed in this year's plan.

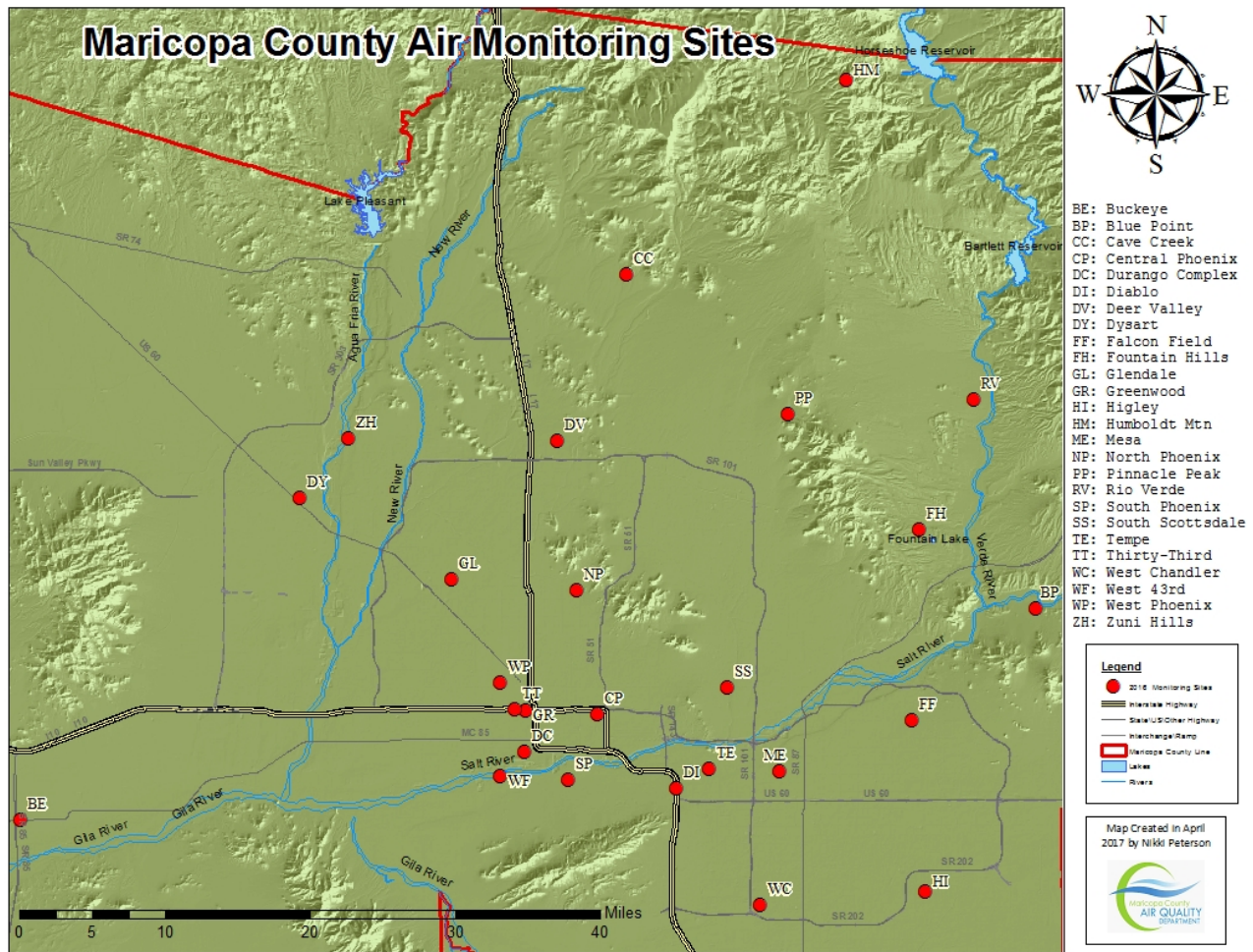


Figure 1. 2016 Air Monitoring Site Map

Overview of the Clean Air Act and Criteria Pollutants

Between the years 1900 and 1970, the emission of the six CPs increased significantly. These pollutants occur throughout the U.S., and are known to cause health problems, property damage, and harm to the environment. This led to the Clean Air Act (CAA) being signed into law in 1970. The CAA, and its amendments, provides the framework for pertinent state/local/tribal agencies to assess and protect air quality through an air monitoring program. The MCAQD monitors for all six CPs, which are:

1. Carbon monoxide (CO)
2. Lead (Pb)
3. Nitrogen oxides (NO_x) with nitrogen dioxide (NO₂) used as the indicator compound
4. Ozone (O₃)
5. Particulate matter ≤10 micrometers (PM₁₀) and ≤2.5 micrometers (PM_{2.5})
6. Sulfur dioxide (SO₂)

The U.S. EPA regulates CPs using the NAAQS, which establish ambient levels for each CP using health and welfare-based criteria. There are two sets of standards. As per the *CAA §109(b)*, the “primary” NAAQS are designed to provide an adequate margin of safety that is requisite to protecting public health. The “secondary” NAAQS are designed to protect public welfare from any known or anticipated adverse effects associated with the presence of a CP in the ambient air. The primary standards protect public health and secondary standards protect public welfare by preventing damage to property such as farm crops and buildings, visibility impairment in national parks and wilderness areas, and the protection of ecosystems.

The NAAQS are not static. The CAA requires that they undergo periodic review using the most recent medical, epidemiological, physiological, and ecosystem research available. Historically, when a NAAQS level is changed; it is lowered and becomes more stringent, or “conservative”. Lowering a NAAQS level occurs when it is considered necessary to meet the CAA standards for protecting public health and welfare.

The NAAQS review is a lengthy process that assesses the science upon which each NAAQS is based as well as the standard itself. The Clean Air Scientific Advisory Committee (CASAC) provides independent advice to EPA concerning the need to change a standard. In addition, comments are solicited from the public. More information regarding the [NAAQS review process](#) is available at EPA’s website.

The U.S. EPA’s Regional Offices oversee the enforcement of the CAA, and MCAQD falls under the jurisdiction of EPA R9. The U.S. EPA Office of Air Quality Planning and Standards (OAQPS) oversees the air monitoring program at a national level, leads regulatory and/or policy changes affecting air monitoring operations and quality requirements, and engages in the review of the NAAQS.

The National Ambient Air Quality Standards

The NAAQS are geared toward improving air quality in geographical areas where the current quality is unacceptable as well as preventing air quality deterioration in geographical areas where the air is relatively free of pollution. Since each CP has different health effects and environmental damage potential, the NAAQS level(s) are different for each pollutant. Some pollutants have standards for both long-term and short-term averaging times. The short-term standards are designed to protect against acute health effects, while the long-term standards are designed to protect against chronic health effects. Table 1 shows a summary the current primary and secondary NAAQS levels for each CP.

Table 1. National Ambient Air Quality Standards

Pollutant		Standard Type	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 $\mu\text{g}/\text{m}^3$	Not to be exceeded
Nitrogen Dioxide (NO ₂)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb	Annual Mean
Ozone (O ₃)		primary and secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM _{2.5}	primary	1 year	12.0 $\mu\text{g}/\text{m}^3$	annual mean, averaged over 3 years
		secondary	1 year	15.0 $\mu\text{g}/\text{m}^3$	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 $\mu\text{g}/\text{m}^3$	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	150 $\mu\text{g}/\text{m}^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO ₂)		primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: Adapted from the table shown: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

The Air Quality Index

To better communicate current CP health risks to the public, EPA developed the Air Quality Index (AQI), a health risk communication tool that converts CP concentrations into six health-impact related color-coded indices based upon the NAAQS. The AQI communicates the air quality forecast using the graduated color scheme shown on Figure 2. The AQI can be used to provide an overall air quality value by combining multiple CP concentrations as well as an air quality value for each CP.

Developing AQIs was furthered over the past few years by continuous analyzers replacing many of their sampler predecessors; thereby making data available electronically as it is generated. Currently, many MOs, including MCAQD, provide near real-time CP data to their agency's website and/or the EPA's website.

Continuous air monitoring data helps air quality professionals gauge current, local air quality conditions. Air quality forecasters can better project AQI values for the next 24 to 48 hours so the public can better prepare for expected air quality conditions. For instance, members of the public may use the AQI values to reduce their exposure to air pollution and its associated health effects by modifying their daily activities.

Index	Color Designation	Air Quality	Health Impact
0 – 50	Green	Good	No harmful effects expected.
51 – 100	Yellow	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101 – 150	Orange	Unhealthy for Sensitive Groups	Active children & adults, people with respiratory disease, e.g., asthma, should limit prolonged outdoor exertion.
151 – 200	Red	Unhealthy	Everyone should observe caution. Avoid prolonged outdoor exertion.
201 – 300	Purple	Very Unhealthy	Avoid all outdoor exertion. Use extreme caution outdoors.
301 – 500	Maroon	Hazardous	Everyone should avoid all outdoor exertion.

Figure 2. The Air Quality Index

Source: 40 CFR Part 58, Appendix G – Uniform Air Quality Index (AQI) and Daily Reporting

The AQI is used throughout the U.S. and the [EPA AIRNow website](#) provides air pollution forecast maps for O₃ and PM_{2.5}, plus real-time air pollution maps with CO, O₃, PM₁₀, and PM_{2.5} data for major metropolitan areas, including the Phoenix metropolitan area. Again, different colors on the map indicate health risks using pollutant concentrations.

Figure 3 shows there is a moderate health risk due to O₃ and PM_{2.5} within the yellow area and an increased risk for unhealthy or sensitive groups within the orange area.

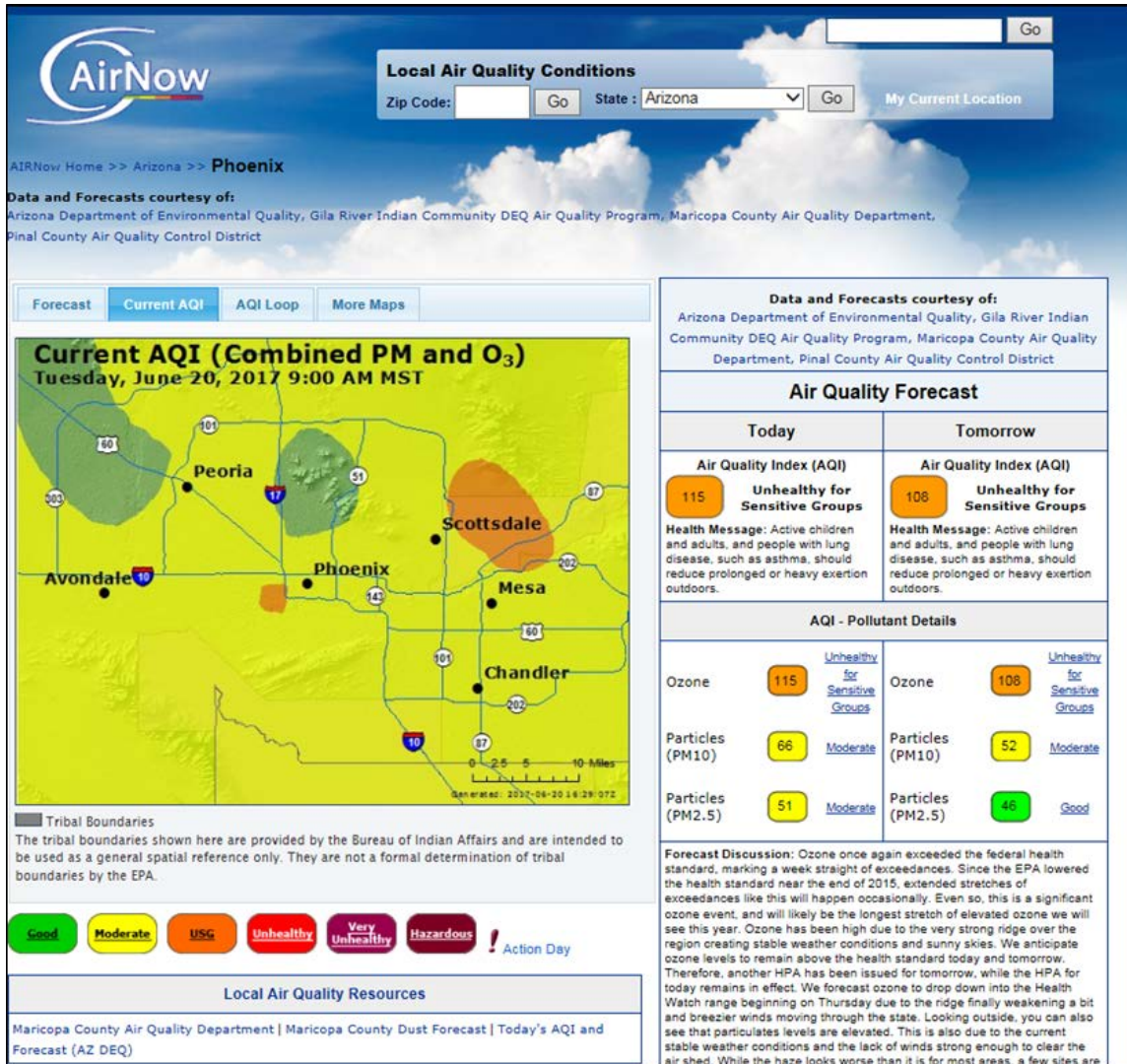


Figure 3. AIRNow AQI Forecast Map
Source: EPA AIRNow Website

The MCAQD has participated in the AIRNow AQI program since 2001. The MCAQD, in cooperation with ADEQ and PCAQCD, expanded the geographical area covered by the AIRNow maps. This area now includes sites as far east as Queen Creek, as far south as Casa Grande, and as far west as Palo Verde. Figure 4 shows the [MCAQD AQI webpage](#).

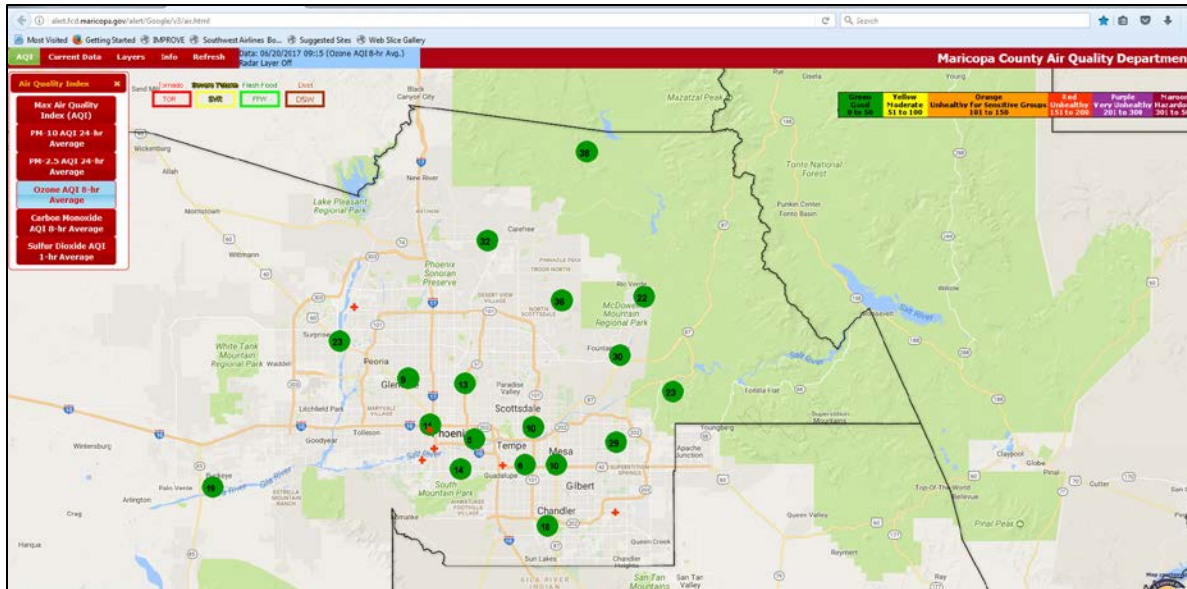


Figure 4. MCAQD AQI Map
Source: MCAQD’s Air Quality Website

In addition to AQI values, the MCAQD website also provides hourly pollutant concentrations for CO, NO₂, O₃, PM₁₀, PM_{2.5}, and SO₂. Figure 5 shows the hourly O₃ data webpage. Please note that if a site does not have an O₃ monitor, a red cross shows to indicate that an O₃ monitor is not at that site. The hourly data webpages used the same depiction on a site-by-site basis for other pollutant monitors.

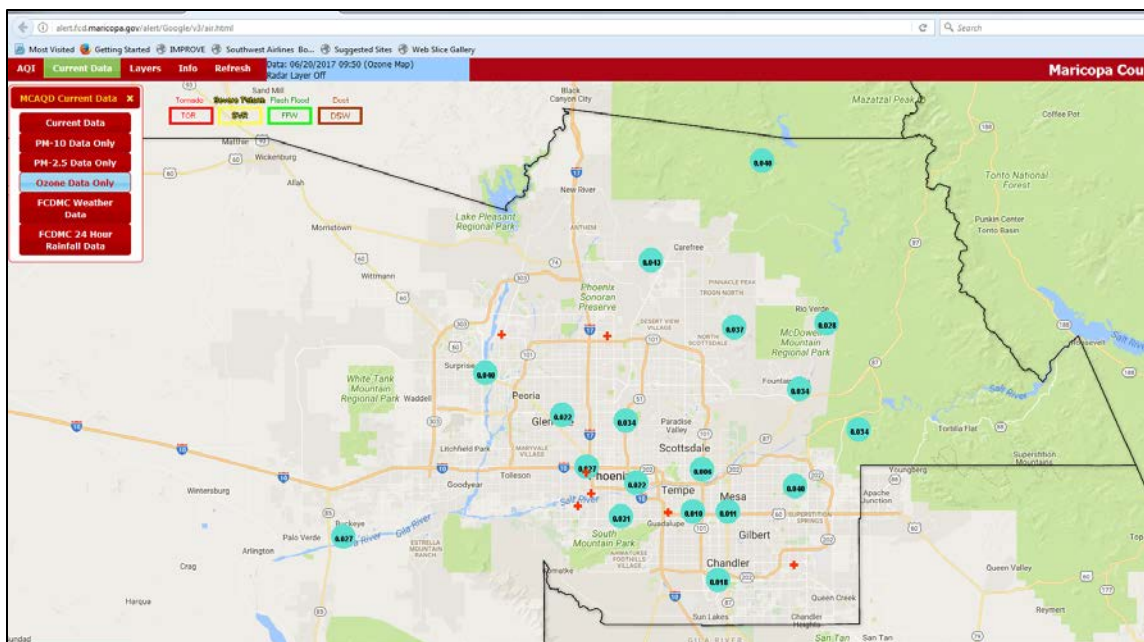


Figure 5. MCAQD Hourly Pollutant Data Map
Source: MCAQD’s Air Quality Website

Information Regarding the Causes, Characteristics, and Compliance of Criteria Pollutants

Unless otherwise noted, the information regarding air pollutants in this section was compiled from various pages at the EPA's [Air and Radiation website](#).

Carbon Monoxide (CO)

Carbon monoxide is a colorless, odorless gas found in both outdoor and indoor air. Carbon monoxide is primarily formed by the incomplete combustion of fossil fuels, e.g., carbon-containing fuels, and the photochemical reactions of gases in the atmosphere. Concentrations of CO tend to peak in the colder, winter months. Carbon monoxide is produced by both natural and anthropogenic sources, aka, human activities. One of the more significant anthropogenic sources of CO is automobile exhaust. Concentrations of CO from motorized vehicles lowered considerably over the last two decades partly due to replacing carburetors with fuel injectors, which results in a more complete combustion of fuel. Natural, or biogenic, sources of CO emissions include volcanic emissions and smoke from wildfires. Smoke from tobacco, cooking, fireplaces, and woodstoves contribute to indoor exposure to CO. In Arizona, the primary sources of CO are exhaust from motor vehicles, electricity generation, industrial and commercial boilers, and household natural gas burning. Carbon monoxide can be a minor contributor to the formation of ground-level O₃.

Carbon monoxide enters the body through inhalation, and the body eliminates CO primarily through exhalation and to a lesser extent through metabolic activity. After being inhaled, CO enters the bloodstream and binds to the blood's hemoglobin; thereby forming carboxy-hemoglobin that displaces oxygen (O₂) in the blood. This reduces the blood's capacity to carry O₂ to organs and tissues and causes the body to become O₂ deprived. This deprivation of O₂ is called hypoxia. This can adversely affect those with anemia, because anemia already reduces the blood's ability to carry O₂. Exposure to CO can result in a type of cardiovascular disease called ischemic heart disease, especially for those with existing heart problems. The central nervous system is adversely affected by CO as well. Acute exposure to severely high levels of CO is toxic and potentially fatal, and its effects on the body are well-known and widely studied. According to the [Agency for Toxic Substances and Disease Registry](#), severe acute poisoning can cause cardiac arrest, heart attack, seizures, hypotension, respiratory arrest, noncardiogenic pulmonary edema, and coma. Moderate exposure may include many symptoms, such as confusion, chest pain, and weakness. Mild exposure may lead to symptoms that include headache, nausea, vomiting, dizziness, and blurred vision.

In 1971 EPA established identical primary and secondary standards for CO: an 8-hour primary standard at 9 parts per million (ppm) and 1-hour primary standard at 35 ppm. The EPA has reviewed the CO NAAQS several times since 1971, which led to the secondary standard being revoked in 1985. The primary standard levels have not changed to date, and currently, CO concentrations nationwide are substantially lower than the CO NAAQS. In 2016, Maricopa County achieved its 21st consecutive year of compliance with the 8-hour CO standard.

This general information was supplemented by the EPA OAQPS Health and Environmental Impacts Division's publication the [Quantitative Risk and Exposure Assessment for Carbon Monoxide – Amended July 2010](#), which was produced for the 2010 CO NAAQS review.

Lead (Pb)

Lead is a heavy metal that occurs naturally in the environment and it is used in manufactured products. The major sources of Pb emissions have historically been motor vehicles and industrial sources. In the early 1970s, EPA established national regulations to reduce the Pb content in gasoline, gradually. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in “highway motor vehicles” in December 1995. A highway vehicle includes, but is not necessarily limited to passenger vehicles propelled by their own motor, whether such motor is powered by gasoline, diesel fuel, special motor fuels, electricity, or otherwise.

As a result of EPA’s regulatory efforts to remove Pb from gasoline, levels of Pb into the air decreased by 94 percent between 1980 and 1999. Levels of airborne Pb in Maricopa County were drastically reduced starting with the introduction of unleaded gasoline. Since Pb concentrations were consistently well below the NAAQS, Maricopa County was allowed to discontinue monitoring for airborne Pb in 1997; although monitoring has resumed today, see below.

Due to the phase-out of leaded gasoline, metals processing is the major source of lead emissions to the air today. The highest levels of Pb in air are generally found near lead smelters. General aviation airports are also a significant source of Pb, as general aviation fuel still contains Pb additives. Other stationary sources include waste incinerators, utilities, and Pb-acid battery manufacturers.

Exposure to Pb has an array of adverse health effects. Once taken into the body, Pb distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the O₂ carrying capacity of the blood. Currently, the foremost health effects associated with Pb exposure to children are neurological and for adults cardiovascular, e.g., high blood pressure and heart disease. Infants and young children are especially sensitive to even low levels of Pb, which may contribute to behavioral problems, learning deficits, and lowered IQ.

Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, direct discharge of waste streams to water bodies, mining, and erosion. Ecosystems near Pb point-sources demonstrate a wide range of adverse effects including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

In 2008, the Pb primary standard was revised to better protect public health, especially for “sensitive” populations, which include asthmatics, children, and the elderly. Initially, Pb monitoring was required near sources that emitted more than one ton of Pb per year. With the introduction of the revised NAAQS, Pb monitoring was initially required at NCORE stations around the U.S. and near other potential sources of Pb. ADEQ operates the local NCORE station, the JLG Supersite. In July 2010, MCAQD opened a new Pb monitoring site at Deer Valley Airport, one of the busiest general aviation airports in Maricopa County and the largest expected source of Pb emissions. Results from more than six years of monitoring have shown that ambient levels of Pb at the airport are still well below the current Pb NAAQS.

Nitrogen Oxides (NO_x) with Nitrogen Dioxide (NO₂) as the Indicator Compound

Nitrogen dioxide belongs to a family of reactive gases called NO_x. These gases are formed when fuel is burned at high temperatures, and they are primarily emitted from motor vehicle exhaust and power plants. Nitrogen oxides are key compounds in the production of ground-level ozone (O₃).

Nitrogen dioxide has been selected by EPA as the “indicator” compound for NO_x. Unlike the other gaseous CPs, we measure the ambient levels of NO_x indirectly. The analytical process involves determining the concentration of NO₂, then nitric oxide (NO). The NO₂ and NO concentrations are summed to determine the NO_x concentration.

For most of the population, the primary route of NO₂ entry into the body is inhalation. Current scientific evidence links short-term NO₂ exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Studies show a connection between breathing elevated short-term NO_x concentrations and increased visits to emergency rooms and hospital admissions for respiratory issues, especially asthma. Additionally, NO₂ reacts with ammonia, moisture, and other compounds to form small nitrate particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis. They can aggravate existing heart disease, leading to increased hospital admissions and premature death, too.

In 1971, EPA established the first primary and secondary standards for NO₂ at 53 ppb, averaged annually. EPA reviewed the standards in 1985 and 1996, and chose not to revise either standard. In January 2010, EPA retained the 1971 standards and added a 1-hour average limit of 100 ppb to the primary standard, determined as a three-year average of the annual 98th percentile value.

Research indicates that individuals who spend time on or near major roadways can experience acute exposures to NO₂ concentrations that are considerably higher than those measured by the NO₂ network. “Near-roadway” means within about 50 meters of a major roadway. Here, the NO₂ concentrations have been found to be approximately 30 to 100% higher than ambient concentrations away from roadways. Research by the EPA shows that NO₂ concentrations inside vehicles can be 2-3 times higher than those measured at nearby area-wide monitors.

For this reason, in February 2010 the EPA revised the 1-hour NO₂ NAAQS and promulgated requirements for monitoring NO₂ near roadways in large urban areas. In response, AMD established two NO₂ monitor sites: Diablo, which is located near I-10 and U.S. Hwy 60 - east of downtown Phoenix, and Thirty-Third, which is located off I-10 and 33rd Avenue - west of downtown Phoenix.

In 2016, there were no exceedances of the 1-hour or annual NO₂ NAAQS standards. Maricopa County is currently in attainment for the NO₂ 1971 and 2010 NAAQS. In fact, no area within the U.S. is in nonattainment with the NO₂ NAAQS.

Ozone (O₃)

Ozone is a colorless, slightly odorous, reactive gas containing three oxygen atoms. Ozone occurs naturally in the Earth's upper atmosphere, or the stratosphere, where it has a beneficial effect of protecting us from the Sun's harmful ultraviolet rays. However, at ground-level, it is the main component of smog, can harm our health, and affect vegetation and ecosystems.

Ozone is not directly emitted into the air, but is formed by a complex photochemical reaction that involves sunlight, heat, and a "soup" of pollutants, especially volatile organic compounds (VOC) and NO_x. Ozone is continually going through a rapid, natural cycle of being formed, then converted back to the more stable, or "normal", "diatomic" oxygen molecule (O₂). Anthropogenic activities have been a leading cause of ground-level O₃ due to VOC and NO_x emissions from industrial facilities, electric utilities, motor vehicles, gasoline and chemical solvent vapors. Ozone is likely to reach unhealthy levels on hot, sunny days in urban environments, but it can affect rural areas by being transported long distances by wind. Although the Phoenix metropolitan area has sunshine most of the year, there is a seasonal pattern to O₃ concentrations with lower concentrations occurring in the winter months.

Ozone causes significant physiological and pathological changes in both animals and humans at concentrations present in many urban environments. Ozone affects the respiratory system in people and animals, and it also affects the growth of plants. The primary route of entry into the body is inhalation. Symptoms of O₃ exposure generally involve the lungs, and can include coughing, a sore or scratchy throat, shortness of breath, chest pain on deep inhalations, increases in asthma attacks, and damage to the lungs. The population at the greatest risk is children. This is because their lungs are still developing, they are more likely to be active outdoors when O₃ levels are high, and they are more likely to have asthma than adults are. It has been widely documented that O₃ even at low concentrations causes damage to plants and reduces crop yields, resulting in it being considered by plant scientists as the most important phytotoxic air pollutant.

In 1979, EPA reduced the 1971 1-hour primary and secondary O₃ NAAQS level of 0.08 ppm to 0.12 ppm. In 1997, EPA revised the O₃ NAAQS establishing an 8-hour NAAQS at a level of 0.08 ppm. Since Maricopa County has attained the 1979 1-hour standard, EPA revoked the 1979 1-hour NAAQS for the Phoenix-Mesa nonattainment area in 2005. In addition, the Phoenix-Mesa nonattainment area for the 1997 8-hour O₃ NAAQS is now in attainment and was redesignated as "attainment" by EPA for this standard effective October 17, 2014.

In March 2008, the NAAQS were lowered again to better protect public health and welfare. The EPA reduced the primary and secondary 8-hour O₃ NAAQS from 0.080 to 0.075 ppm (75 ppb). Compliance with the standard is determined by averaging the fourth highest 8-hour average over a 3-year period, which must be less than or equal to 0.075 ppm. When the 2008 NAAQS became effective in May 2008, O₃ concentrations in the County had improved, but exceeded the new level. This led to EPA designating portions of Maricopa and Pinal Counties as nonattainment for the 2008 O₃ NAAQS in 2012. Excluding portions of Maricopa and Pinal Counties, Arizona is in attainment for the 2008 O₃ NAAQS. How well the state fares with the 2015 NAAQS is currently under review.

In December 2015, the O₃ NAAQS levels were lowered to 0.070 ppm. More information regarding how this lower level may affect the number of O₃ exceedances experienced in Maricopa County can be found in the 2016 NAAQS Exceedance and Violation Summary section.

Particulate Matter (PM)

Particulate matter is a collective term describing very small solid or liquid particles that vary considerably in size, geometry, chemical composition, and physical properties. Numerous chemical components may be present in particle pollution including acids, nitrates, sulfates, organic chemicals, metals, soils, and finer dust particles. Particulates can be formed by natural processes, such as pollen production and wind erosion, and anthropogenic activities, such as commercial/industrial/agricultural operations and motor vehicle use. Particulates contribute to visibility reduction, pose a threat to public health, and cause economic damage.

The EPA currently regulates PM pollution using two size categories:

- “PM₁₀”, particles with size range ≤ 10 micrometers (μm) in aerometric diameter; and
- “PM_{2.5}”, aka “fine particles”, particles with a size range of ≤ 2.5 μm in aerometric diameter.

The larger particles that make up PM₁₀ form through mechanical processes such as the grinding of matter and the atomization of liquids, natural weathering processes, and anthropogenic activities that disturb soil. In Arizona, elevated concentrations of PM₁₀ are associated with people driving on unpaved roads, dusty industries, and dust storms related to high wind events.

Fine particulates are formed by the incomplete combustion of fossil fuels, the condensation of vapors, and photochemical processes. Fine particulates are further classified as “primary”, meaning they are produced within and emitted directly from a source such as exhaust from a diesel engine or smoke from a fire. “Secondary” particulates form in the atmosphere from gaseous pollutants. Nitrates and sulfates are formed by the photochemical oxidation of gaseous NO₂ and SO₂, respectively. In addition, secondary organic carbon particles form through a photochemical transformation of gaseous organic compounds.

The primary route of entry for PM₁₀ into the body is through inhalation. The size, shape, and chemical composition of particulates determine the health effects that may result from PM exposures. The potential for causing health problems is directly linked to particle size. Smaller particles are more toxic than larger particles because of the higher relative content of toxic metals and ions combined with the increase of particle surface area. The EPA is concerned about particles ≤ 10 μm in diameter, because those are the particles that generally pass through the throat and nose and enter the lungs. Coarser particles are deposited in the upper parts of the respiratory system, but finer particles are deposited deeper into the respiratory system. Fine particles are small enough to be deposited in the lung’s alveoli, which are tiny air sacks deep inside the lungs. Some research shows that the smallest of particles may enter the bloodstream as well. Currently, research is underway to better understand the health effects of ultrafine particles.

The populations most at risk from particulate exposure are older adults, diabetics, and children; because children tend to be more physically active and that causes them to breath faster and deeper. Once inhaled, these particles can cause serious heart and lung health effects that affect both humans and animals. Epidemiological studies show that long-term, chronic exposures, i.e., years of exposure to high levels of particulates, are associated with reduced lung function, the development of chronic bronchitis, and premature death. Studies show that short-term, acute exposures, i.e., hours to days of exposure to high levels of particulates, can aggravate lung disease, asthma attacks, acute bronchitis,

and may increase susceptibility of respiratory infections. For those with heart disease, it can induce heart attacks. Exposure to acidic aerosols, i.e., acidic particles with an aerometric diameter of about 0.01 – 100 μm , have been linked to the upper respiratory tract and pulmonary system's inability to remove harmful particles.

In 1987, the EPA replaced the 1971 Total Suspended Particulates (TSP), i.e., particles around 40 μm and less in aerometric diameter, with the primary and secondary NAAQS for PM_{10} . The EPA revoked the annual PM_{10} NAAQS in 2006. Currently, the 24-hour primary and secondary levels for PM_{10} are both 150 $\mu\text{g}/\text{m}^3$. In 2012, the PM_{10} NAAQS underwent review with exposure to $\text{PM}_{10-2.5}$ also being considered. This review resulted in EPA retaining the existing primary and secondary 24-hour PM_{10} NAAQS, which is considered to provide for protection against effects associated with acute exposure to $\text{PM}_{10-2.5}$.

In 1997, the EPA reviewed and updated the $\text{PM}_{2.5}$ NAAQS levels. Since then, these NAAQS have been reviewed in 2006 and 2012 with some levels being made more stringent. On December 14, 2012, EPA retained the primary 24-hour $\text{PM}_{2.5}$ standard of 35.0 $\mu\text{g}/\text{m}^3$, but reduced the primary and secondary NAAQS annual $\text{PM}_{2.5}$ level to 12.0 $\mu\text{g}/\text{m}^3$ and 15.0 $\mu\text{g}/\text{m}^3$, respectively. While Maricopa County is currently in attainment for $\text{PM}_{2.5}$, we tend to experience 24-hour exceedances during the colder, winter months, especially from Thanksgiving into January. In colder months, smoke from residential fireplaces coupled with the temperature inversions tends to drive up $\text{PM}_{2.5}$ concentrations throughout the metropolitan area.

To address this problem, ADEQ and Maricopa County worked together on a public outreach campaign to reduce wood burning within the county around the fall/winter holidays. Maricopa County's umbrella dust abatement rule, [*Rule 310 – Fugitive Dust From Dust-Generating Operations*](#), has been revised many times through the years. *Rule 310* regulates construction dust, trackout dust, and dust from unpaved parking and vacant lots. The recent PM_{10} State Implementation Plan (SIP) includes seventy-seven new measures to enhance enforcement of the rule, implementation of agricultural best management practices, diesel engine replacement and retirement programs, and requirements for cleaner burning fireplaces to further reduce $\text{PM}_{2.5}$ emissions.

The western U.S. has a unique problem with respect to exceedances of the PM NAAQS. It has been acknowledged for decades that exceedances of the PM NAAQS due to blowing dust and smoke from massive wildfires may be “exceptional” in nature, i.e., not expected to recur or caused by acts of nature that overwhelm emission controls. Initially by policy, and later by rule, EPA established procedures and standards for documenting whether an exceedance of the NAAQS is the result of an “exceptional event” (EE) and if the pollutant data should be excluded from NAAQS compliance determinations. In 2007, EPA adopted the [*Treatment of Data Influenced by Exceptional Events \(EER\)*](#) rule that covers how to prepare an EE package for EPA's review and how to manage event-related data. In the past few years, most exceedances of the PM_{10} NAAQS within Maricopa County have been successfully shown to meet the EE requirements. Exceptional event information for 2014-2016 is shown in the 2016 Summary of Network Results and Required Information section.

Sulfur Dioxide (SO₂)

Sulfur dioxide is a colorless gas with a pungent irritating odor at elevated concentrations. It is emitted primarily from the burning of high-sulfur coal, oil, and diesel fuel, and the smelting of metals like copper. Most fuels contain trace quantities of sulfur. When fuels burn, both gaseous SO₂ and sulfate particles are released into the air due to incomplete combustion of the fuel. Consequently, separating the health effects of these two chemicals is difficult. Together, SO₂ and PM_{2.5} act separately and together to threaten public health and can make up a major portion of pollution in many cities. Sulfur dioxide is removed from the atmosphere through dry deposition, and it is converted to sulfuric acid, and eventually sulfate particles. Both contribute to public health problems and negatively affect the environment. The SO₂ and sulfate from vehicular emissions have been significantly reduced over the years through lowering the sulfur content in diesel fuel and gasoline.

Sulfur dioxide's primary route of entry into the body is by inhalation. It contributes to respiratory illness, particularly in children and the elderly, and aggravates existing heart and lung diseases. Sulfur dioxide contributes to the formation of acid rain, and it contributes to the formation of atmospheric particles that cause visibility impairment, most notably in national parks. Sulfur dioxide and the pollutants formed from SO₂, such as sulfate particles, can be transported over long distances and deposited far from the point of origin. This means that problems associated with SO₂ are not confined to areas where it is emitted.

The EPA [2011 National Emissions Inventory](#) (NEI) report shows the estimated quantity of SO₂ emitted from various sources in Arizona and in Maricopa County. The majority of statewide SO₂ emissions occurs in eastern Arizona and is produced by coal-based electricity generation, the smelting of non-ferrous sulfide copper ore, and smoke from wildfires. Major controls were installed in Arizona's copper smelters in the 1980s, which reduced SO₂ emissions substantially. In addition, most of the copper ore smelters that used to operate have been shutdown, which reduced SO₂ emissions in localized areas around the state. As of 2013, the only regulated smelters operating in Arizona are located about 90 miles east of downtown Phoenix, in Miami and Hayden, Arizona. In Maricopa County, mobile and industrial sources emit the majority of SO₂.

Currently, Maricopa County is in attainment for SO₂. The AMD operates two year-round SO₂ monitoring stations, and the siting of SO₂ monitors meets EPA requirements.

AIR MONITORING STRATEGIES AND SURVEILLANCE SYSTEM DESIGN

Overview of Air Monitoring Requirements and System Design

The AMD monitors for the six CPs by operating and maintaining 26 ambient air monitoring sites located throughout Maricopa County. The sites' startup dates range from 1961 for Central Phoenix to 2015 for Thirty-Third. Land use patterns around the sites vary from densely populated urban areas to sparsely populated rural settings. The sites' elevations range from 845 feet above sea level at Buckeye to 5190 feet above sea level at the top of Humboldt Mountain. Some sites measure many pollutants, while others may only measure one or two. The MCAQD chose each site and its pollutant monitors based on specific EPA requirements as described below, special requests from EPA, and/or specific needs of the County.

The *40 CFR Parts 50, 53, and 58* provides the requirements for operating an ambient air monitoring program. The MCAQD is fully responsible for designing and operating the total air monitoring surveillance system and managing the pollutant data generated. The MCAQD holds the Primary Quality Assurance Organization (PQAO) designation for the county's ambient air monitoring network, which basically means that we do not share QA roles and/or responsibilities with another MO. The MCAQD operates air monitors at EPA-approved State and Local Air Monitoring Stations (SLAMS), which includes the near-road NO₂ stations. On occasion, special air monitoring initiatives involve temporarily operating CP monitors designated as Special Purpose Monitors (SPM), as well as PM speciation and air toxics monitors.

This section details how each CP network is designed to obtain "representative" data. The *40 CFR Part 58 Appendix D* covers the requirements for designing the air monitoring network and is summarized in this section. To determine compliance with the NAAQS, EPA-approved air monitors must collect the CP data. The EPA classifies approved monitor methods into one of three categories: a federal reference method (FRM), a federal equivalent method (FEM), or an approved regional method (ARM). The MCAQD uses FRM and FEM instruments. This practice ensures high-quality data of like kind are used for compliance-driven decisions.

However, data from research monitors, e.g., non-compliance monitors, can be used to develop state and/or federal attainment and maintenance plans, further evaluate regional air quality models used in developing emissions control strategies, tracking trends in air pollution, and evaluating the impact control measures are having on improving air quality. Any short-term research data collected by the MCAQD can be made available to decision makers; but the data are not reported to AQS.

Within Maricopa County, the ADEQ collects compliance data as well as research data at the JLG Supersite via the following EPA monitoring networks: National Core multi-pollutant site (NCORE), Photochemical Ambient Monitoring Stations (PAMS), Chemical Speciation Network (CSN), and National Air Toxics Trends Stations (NATTS). The ADEQ also collects air toxics samples for the Urban Air Toxics Monitoring Program (UATMP) at MCAQD's South Phoenix site. In addition, ADEQ collects PAMS data east of Maricopa County, near Queen Valley which is located in Pinal County. The data from these networks are reported to EPA and should be available in AQS and/or another EPA database.

In addition to producing an annual network plan, the EPA now requires a five-year network assessment as per *40 CFR Part 58.10*. The 5-year assessment is best served by collaborating with EPA, ADEQ, and other local and/or tribal MOs. The first assessment was produced in 2010 and the second was produced in 2015. The assessment process continues to improve, and MCAQD works with other MOs regarding CP network design issues as needed. The MOs within Arizona may provide support to each other by exchanging technical services and/or knowledge when problems arise with instrumentation or when conducting special studies.

Basic Air Monitoring Objectives

Each ambient air monitor must have a designated basic monitoring objective. The three objectives below apply to establishing required SLAMS monitoring stations and choosing the general locations for additional monitoring sites. This appendix further describes specific requirements for specific pollutants as well as other air monitoring networks not operated by the MCAQD such as NCore, PAMS, PM speciation and O₃ precursors. The objectives are not listed based on importance or priority. Each objective is important and must be considered individually. Table 2 shows the three basic objectives.

Table 2. Basic SLAMS Air Monitoring Objectives

Objective	Description
Provide air pollution data to the general public in a timely manner	Data can be presented to the public in a number of attractive ways including: air quality maps, newspapers, MOs and EPA websites, and as part of weather forecasts and public advisories.
Support compliance with ambient air quality standards and emissions strategy development	Data from EPA-approved monitors for NAAQS pollutants will be used for comparing an area’s air pollution levels.
Support for air pollution research studies	Supplemental data useful with health effect assessments, atmospheric processes, or monitoring methods development work.

Source: *40 CFR Part 58 Appendix D, 1.1(a – c)*

Monitor Types

As mentioned earlier, each pollutant monitor must be designated one of three types. The monitor type is based upon how the data will be used and how long the monitor will remain in operation. Again, the MCAQD's air monitoring network is comprised of SLAMS, which gather data for comparison to the NAAQS. The MCAQD may operate SPMs temporarily. These monitors are useful for gathering and reporting preliminary information regarding air quality in a local area quickly.

In the event of a geographical area's population increasing or data indicating that a SLAMS is more appropriate, an SPM may be reclassified to SLAMS and potentially outfitted with a different method. The *40 CFR Part 58.20 Subpart C* states that

“an SPM any monitor included in an agency's monitoring network that the agency has designated as a special purpose monitor in its annual monitoring network plan and in AQS, and which the agency does not count when showing compliance with the minimum requirements of this subpart for the number and siting of monitor of various types. Any SPM operated by an air monitoring agency must be included in the period assessments and the annual monitoring network plan”.

The third type of monitor is a potentially significant deterioration (PSD) monitor is used for permitting a source facility before starting in a protected area. There are no Class A areas established within Maricopa County. Table 3 shows the three monitor types defined by EPA in *40 CFR Part 58*.

Table 3. Monitor Types

Name	Description of Use
SLAMS	EPA-approved, compliance monitor typically operated on a long-term basis.
SPM*	A monitor typically operated on a short-term basis and not necessarily EPA-approved.
PSD	A monitor typically operated for less than two years prior to a source opening in a protected Class A area and usually required by the permitting authority.

* Reference *40 CFR Part 58* for important EPA's requirements regarding SPM monitor operation. Usually, if the SPM operates for more than two years and meets *40 CFR Part 58 Appendix D* siting requirements, removing it will need prior approval by EPA

Site Types

To support the three basic monitor objectives, each site must be identified as one of the six “site types” shown below. Site types may vary within each pollutant’s network. The site type is key to informing air quality professionals and the public about a pollutant’s peak concentration levels. Table 4 shows the site types as defined by EPA.

Table 4. Site Types

Determine the <i>highest concentrations</i> expected to occur in the area covered by the network.
Measure typical concentrations in areas of <i>high population density (population exposure)</i> .
Determine the impact of significant <i>sources</i> or source categories on air quality.
Determine general <i>background concentration</i> levels.
Determine the extent of <i>regional pollutant transport</i> among populated areas and in support of secondary standards.
Measure air pollution <i>impacts to visibility, vegetation damage, or other welfare-based impacts</i> .

Source: Adapted from 40 CFR Part 58, Appendix D.1

Monitoring Scales (Spatial Scales of Representativeness)

To help link the monitoring objective and the site type with the physical location of a monitor, EPA developed the “spatial scale of representativeness” concept. As per 40 CFR Part 58, Appendix D 1.2 (a) and (b),

“The goal in locating air monitors is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring site type, air pollutant to be measured and the monitoring objective. Thus, spatial Scale of representativeness is described in terms of physical dimension of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar”.

Table 5 shows six scales of representativeness that are of most interest for the air monitoring site types described above.

Table 5. Spatial Scales of Representativeness

Name	Distance
Micro Scale	0 to 100 meters
Middle Scale	100 to 500 meters
Neighborhood Scale	0.5 to 4 kilometers
Urban Scale	4 to 50 kilometers
Regional Scale	10s to 100s of kilometers
National and Global Scales	Characterize the nation and the globe as a whole

Source: Adapted from 40 CFR Part 58, Appendix D 1.2

Locating Air Monitoring Sites

The air monitoring network is designed to provide pollutant data that represents countywide “ambient” air quality. EPA defines ambient air as “the air to which the public has access”. Since it is physically and fiscally impossible to monitor the air in every location, each monitor’s objective, the associated site type, and corresponding spatial scale of representativeness most appropriate for the CP to be measured are foremost in determining each site’s location. In addition to correctly integrating the above considerations, a site’s location must also have reasonable accessibility, security, and operating feasibility, such as a property owner’s agreeability to have monitoring conducted on their land and a clean power supply.

For example, consider the case where the objective is to determine NAAQS compliance by understanding the maximum O₃ concentrations for an area. Such areas would most likely be located downwind of a metropolitan area in a suburban residential area where children and other susceptible individuals are likely to be outdoors. Sites located in these areas are most likely to represent an urban scale of measurement. In this example, O₃ precursor emission patterns, public activity, and meteorological characteristics that affect O₃ formation and dispersion were considered when selecting an O₃ monitoring site’s physical/geographical location; and, the spatial scale of representativeness was a result of the selection process.

When applying these principles, the total quantity of monitoring sites that will serve the variety of data needs is often substantially higher than federal minimum requirements. The optimal size of each pollutant’s network involves compromises among data needs and available resources; and, a network’s size can change over time. Each pollutant’s network must be dynamic enough to maintain a current representative sampling of the air quality.

Daily Uses of Criteria Pollutant Data

Air Quality Forecasting

The ADEQ, in conjunction with MCAQD, has developed a year-round air quality forecasting capability for the Phoenix metropolitan area. ADEQ takes the lead on air quality forecasting and the issuing of a High Pollution Advisory (HPA) or a Health Watch (HW), while the MCAQD provides monitoring data and designates No-Burn Days. In 2015, AMD continued to supply CP and meteorological data to the ADEQ forecasters on a daily basis. In 2015, we began supplying CP and meteorological data to MAG on a daily basis as well.

Maricopa County's Air Monitoring Website

The department continued distributing 1-hour and 5-minute continuous CP data for the [Maricopa County Interactive Pollution Map](#). The website provides each pollutant's concentrations as well as AQI values. By having easy access to this information, the public can better plan their daily activities.

EPA's AIRNow Website

The department continued distributing 1-hour and 5-minute continuous CP data for the EPA's AIRNow website, which serves the same purpose as that of the Maricopa County's website.

Overview of the Air Monitoring Sites

Maricopa County has a population of over 3.9 million people based on the 2012 U.S. Census estimate. As per *40 CFR Part 58*, the EPA mandates the minimum quantity of monitors required by a pollutant's network to properly represent the County's population. As previously mentioned, the MCAQD pollutant networks are designed using the concept of spatial scale representativeness and monitoring objectives. This has resulted in CP networks that meet, and in most cases exceed, the minimum quantity of monitors required by EPA (see "Required General Information on Monitoring Network" in Appendix II). See Figure 1 for the site map.

The following tables show details regarding each site's MCAQD name and abbreviation, EPA's AQS identification number, geographic coordinates, and the full complement of air monitors and/or sensors at each site.

Table 6 shows the MCAQD's site names, abbreviations, and the AQS identification number.

Table 6. Monitoring Site Identification Information

Name	AMD Abbreviation	AQS ID
Blue Point	BP	04-013-9702
Buckeye	BE	04-013-4011
Cave Creek	CC	04-013-4008
Central Phoenix	CP	04-013-3002
Deer Valley	DV	04-013-4018
Diablo	DI	04-013-4019
Durango Complex	DC	04-013-9812
Dysart	DY	04-013-4010
Falcon Field	FF	04-013-1010
Fountain Hills	FH	04-013-9704
Glendale	GL	04-013-2001
* Greenwood	GR	04-013-3010
** Higley	HI	04-013-4006
Humboldt Mountain	HM	04-013-9508
Mesa	ME	04-013-1003
North Phoenix	NP	04-013-1004
Pinnacle Peak	PP	04-013-2005
Rio Verde	RV	04-013-9706
South Phoenix	SP	04-013-4003
South Scottsdale	SS	04-013-3003
Tempe	TE	04-013-4005
Thirty-Third	TT	04-013-4020
West Chandler	WC	04-013-4004
West 43 rd	WF	04-013-4009
West Phoenix	WP	04-013-0019
Zuni Hills	ZH	04-013-4016

* This site discontinued operation permanently in June 2016.

** This site experienced an extended monitoring interruption in 2016.

Table 7 shows the specific geographic coordinates for the location of each site.

Table 7. Monitoring Site Locations

Site	AQS ID#	Latitude	Longitude	Location
BE	04-013-4011	33.37005	-112.62070	MC Hwy. 85 & AZ Hwy. 85
BP	04-013-9702	33.54549	-111.60925	Usery Pass & Bush Hwy.
CC	04-013-4008	33.82169	-112.01739	32 nd St. & Carefree Hwy.
CP	04-013-3002	33.45793	-112.04601	19 th St. & Roosevelt St.
DV	04-013-4018	33.68462	-112.08635	10 th Ave. & Deer Valley Rd.
DC	04-013-9812	33.42650	-112.11814	27 th Ave. & Durango St.
DY	04-013-4010	33.63713	-112.34184	Bell Rd. & Dysart Rd.
DI	04-013-4019	33.39625	-111.96797	Fairmont Dr. & Diablo Way
FF	04-013-1010	33.45223	-111.73331	McKellips Rd. & Greenfield Rd.
FH	04-013-9704	33.61103	-111.72529	E. Palisades Blvd. & Fountain Hills Blvd.
GL	04-013-2001	33.57454	-112.19196	59 th Ave. & W. Olive Ave.
GR	04-013-3010	33.46093	-112.11748	27 th Ave. & Interstate 10
HI	04-013-4006	<i>33.30994</i>	<i>-111.72002</i>	Higley Rd. & Williams Field Rd.
HM	04-013-9508	33.98280	-111.79870	Top of Humboldt Mountain
ME	04-013-1003	33.41045	-111.86507	Broadway Rd. & Alma School Rd.
NP	04-013-1004	33.56033	-112.06626	7 th St. & Dunlap Ave.
PP	04-013-2005	33.70632	-111.85556	Alma School Rd. & Happy Valley Rd.
RV	04-013-9706	33.71881	-111.67183	Forest Rd. & Del Ray Ave.
SP	04-013-4003	33.40316	-112.07533	Central Ave. & Broadway Rd.
SS	04-013-3003	33.47968	-111.91721	Scottsdale Rd. & Miller Rd.
TE	04-013-4005	33.41240	-111.93473	College Ave. & Apache Blvd.
TT	04-013-4020	33.46155	-112.12815	Interstate 10 & 33 rd Ave.
WC	04-013-4004	33.29898	-111.88431	Ellis St. & Frye Rd.
WF	04-013-4009	33.40642	-112.14434	43 rd Ave. & Broadway Rd.
WP	04-013-0019	33.48385	-112.14257	39 th Ave. & Earll Dr.
ZH	04-013-4016	33.68673	-112.29417	109 th Ave. & Deer Valley Rd.

NOTE: HI – lat/long changed – new coordinates shown in italics

Source: EPA AQS database – 2016 Site Description Report (AMP380)

Figure 6 provides the complement of air monitoring instruments operating at each site in 2016.

Maricopa County - Air Monitoring Site Instrumentation																				
Site	AQS Code	CO	NO ₂	O ₃	SO ₂	PM ₁₀	PM _{2.5}	PM _{2.5} Filter	Pb Filter	H ₂ S	WS / WD	Baro Press	Delta T	Amb Temp	Rel Hum	Rain	Solar Rad	Room	Multi-Gas Cal	Active Instruments
BE	04-013-4011	1	1	1		1					1	1		1	1			1	1	10
BP	04-013-9702			1							1			1	1			1		5
CC	04-013-4008			1							1			1	1	1		1		6
CP	04-013-3002	1	1	1	1	1					1	1		1	1			1	1	10
DC	04-013-9812				1	1	1				1	1		1	1			1	1	9
DI	04-013-4019	1	1				1				1			1	1			1	1	8
DV	04-013-4018								2		1	1		1	1			1		7
DY	04-013-4010	1		1		1					1	1		1	1			1		8
FF	04-013-1010			1							1			1	1			1		5
FH	04-013-9704			1							1	1		1	1			1		6
GL	04-013-2001	1		1		1	1				1	1		1	1			1		9
GR	04-013-3010	1	1			1					1	1		1				1	1	8
HI	04-013-4006					1					1	1	1	1				1		6
HM	04-013-9508			1							1			1	1			1		5
ME	04-013-1003	1		1		1	1				1	1		1	1			1		9
MM	Not Applicable	1	1		1	1	1			1	1	1		1	1		1	1	1	13
NP	04-013-1004	1		1		1	1				1	1	1	1	1		1	1		10
PP	04-013-2005			1							1	1		1	1			1		6
RV	04-013-9706			1														1		2
SP	04-013-4003	1		1		1	1				1	1		1	1			1		9
SS	04-013-3003	1		1		1					1	1		1	1			1		8
TE	04-013-4005	1		1		1	1				1		1	1		1		1		9
TT	04-013-4020	1	1				1				1			1				1	1	7
WC	04-013-4004	1		1		1					1	1		1	1			1		8
WF	04-013-4009					1					1	1	1	1				1		6
WP	04-013-0019	1	1	1		1	1	1			1	1	1	1				1	1	12
ZH	04-013-4016					1					1			1						3
Active Instruments		15	7	18	3	17	10	1	2	1	26	18	5	26	17	2	2	26	8	

Note: As of 09/01/16, the CO network reduced to six year-round monitors permanently closed
temporarily closed
special purpose monitor

Total # of Criteria Pollutant Monitors 73
Total # of Active Instruments 204
Total # of Active Sites 26
Mobile Truck 1

Figure 6. 2016 Air Monitoring Instruments by Site

2016 SUMMARY OF NETWORK RESULTS AND REQUIRED INFORMATION

Determining Data Quality and Acceptability

This sections details the results obtained from our 2016 monitoring year. The EPA has established data quality and measurement quality objectives for CP data. In addition to *40 CFR Part 58*, the EPA [*QA Handbook for Air Pollution Measurement Systems: Volume II: Ambient Air Quality Monitoring Program*](#) provides extensive information regarding the quality system and its components. There are seven data quality indicators (DQI) established by the EPA to determine the quality of ambient air data. Data must meet each indicator’s requirement to be certified and acceptable for use by decision makers for NAAQS compliance determinations, researchers, and the public.

These indicators are precision, bias, completeness, comparability, detectability, representativeness, and sensitivity. “Timeliness” of data collection, validation, and upload to AQS are important as well. “Accuracy” is now defined as a measure of the overall agreement of a measurement to a known value and includes a combination of random error (precision) and systematic error (bias) components of both sampling and analytical operations. The AMD’s personnel evaluate data using these indicators, with precision, bias, and completeness being the most crucial to evaluate on an ongoing basis.

Data Completeness

Before considering any data set valid, it must first pass a data recovery, or completeness, test. The test requirements begin with checking completeness at hourly and 24-hour concentration values. These values may be referred to as “samples”. The CP pollutant data measurements from continuous analyzers are based on a valid hour, while filter samples from manual samplers are based on a 24-hour sampling period from midnight to midnight. Equation 1 shows the calculation for the data completeness percentage, which is the quantity of valid measurements divided by the quantity of scheduled measurements multiplied by one-hundred. For CP data, completeness must be greater than 75% for a data set to pass the first validity test. Furthermore, CP data completeness requirements may vary and use multiple levels of data aggregation, e.g., 1-hour, 3-hour, 8-hour, 24-hour, quarterly, annual, and multiple years.

<i>Equation 1:</i>	
Data Completeness Percentage	= $\frac{\text{Qty. of Valid Measurements}}{\text{Qty. of Measurements Scheduled}} \times (100)$

Table 8 shows the pollutant data completeness percentages for 2016.

Table 8. 2016 Criteria Pollutant Data Completeness for SLAMS

Pollutant	CO	Pb	O ₃	NO ₂	SO ₂	PM _{2.5}	PM ₁₀	TOTAL
Percent Complete	98.2	90.0	99.7	97.8	99.0	97.1	98.3	98.2

Source: EPA AQS database - 2016 Data Completeness Report (AMP430)

Increasing Data Volumes

Due to increasing data requirements and the availability of FEM analyzers, the amount of data the AMD produces increased considerably over the past few years. Operating and maintaining the various components of each air monitoring network is an ongoing challenge. To remain current with EPA's requirements and to meet decision makers and researchers' data needs, AMD personnel adjust standard operating procedures according to EPA's latest requirements and/or guidance to ensure only high-quality data are being produced. In addition to the increased amount of CP data generated and managed, supporting components of the surveillance system such as the communications system to the sites and the database used for data management also need continuing upgrades. So far, AMD has managed to make significant program changes to keep up with the increasing demand for data. By automating some processes, we have been able to successfully respond to data needs without increases to personnel. The following information summarizes a few notable changes that have been implemented to date.

- The commercial database, AirVision™, has enhanced our ability to manage the increase in data volume. It has helped to advance data validation and dissemination, as well as data retrieval/storage/security. The database must be maintained and updated regularly to keep up with software changes involving data collection, validation, and reporting to AQS.
- AirVision™ also allows AMD personnel to perform multiple data checks throughout the workday to help prevent bad data from being released to the public via the County and EPA's websites. In addition, it is used to upload preliminary data to the MC website as close as possible to real-time.
- A Rapid Response Notification System (RRNS) was implemented to better manage quickly-developing pollution events. The RRNS uses automated alarms to monitor instrument performance and incoming pollutant concentrations. The triggering instrument warning and pollutant concentration levels can be adjusted as needed for each alarm. The AirVision™ database is programmed to automatically generate these alerts.

Table 9 shows the amount of 1-hour data AMD has been producing per year, plus the near eightfold increase of data produced when AMD started collecting 5-minute data.

Table 9. Approximate Amount of 2016 Data Produced

Type	1-Hour CP Data	1-Hour CP and Met Data	1-Hour, 5-minute and 24-hour CP and Met Data
Amount	550,000	1,010,000	14,650,000

Summary of 2016 Criteria Pollutant Data

This section covers the 2016 data generated by each CP's network.

Carbon Monoxide (CO)

Figure 7 shows the CO monitoring sites operating at the beginning of 2016. The CO monitors are designated as SLAMS except for Thirty-Third's, which was designated as an SPM. In April, the quantity of CO monitors decreased from fourteen to thirteen after the Thirty-Third site's SPM discontinued operation. In June, the quantity of CO monitors reduced to twelve after the Greenwood site's CO monitor discontinued operation. Later, in September, the quantity further reduced to seven monitors after discontinuing operation of most seasonal CO monitors. The seasonal monitor at South Phoenix changed to year-round operation. The network is now comprised of seven year-round CO monitors. The EPA R9 approved of the changes to the SLAMS monitors and CO network before they were made.

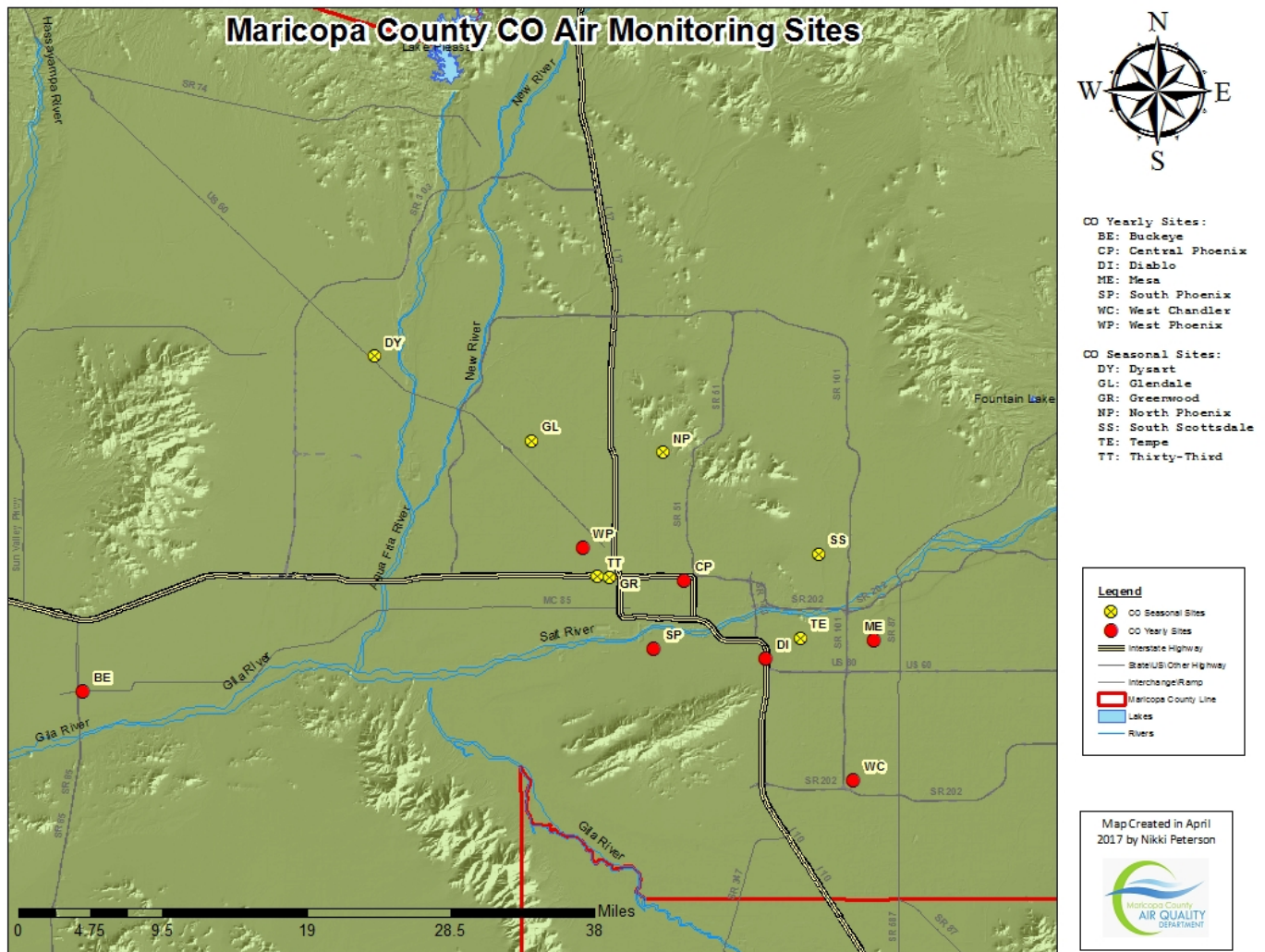


Figure 7. 2016 CO Monitoring Site Map

There are two primary standard levels for CO: an 8-hour average of 9 ppm and a 1-hour average of 35 ppm. A violation of either standard is based on two exceedances in a calendar year. It is worth noting that the area has not exceeded the CO NAAQS since 1996. For 2016, the data from the CO monitors were reported to AQS, and the data are suitable for NAAQS comparison except for the data from the Dysart and Thirty-Third monitors. These monitors were discontinued prior to their scheduled QA performance evaluation.

The Phoenix metropolitan area was once designated as being in moderate nonattainment for CO for the 1971 primary NAAQS. A nonattainment SIP was developed by ADEQ that covered how to reduce and maintain CO concentrations. The area failed to reach attainment by the end of 1995, which caused EPA to reclassify the area to serious nonattainment in 1996, with a new attainment date of December 31, 2000. In response, the Governor's Office, Legislature, Maricopa County, and other entities worked cooperatively to find ways to reduce CO that included implementing innovative programs such as a nationally recognized, enhanced vehicle emissions inspection program, a cleaner burning gasoline program, pollution reduction measures for commercial and industrial sources, and woodburning restrictions. As a result, CO concentrations declined and data showed that the area had reached attainment with the 8-hour primary NAAQS.

In April 2005, the EPA redesignated the Phoenix metropolitan area to attainment for CO and approved the attainment demonstration and maintenance plan, which shows how the area will maintain compliance with the CO NAAQS through 2015. However, Maricopa County must continue to show that the air quality is maintaining compliance with the NAAQS for a period of 20 years from the attainment determination. The area is now covered by a 10-year maintenance SIP that is renewed in its 8th year for the next 10-year maintenance SIP. Since we are now in maintenance/attainment, the majority of CO monitors can operate seasonally rather than year-round. In 2016, the quantity of CO analyzers was reduced to from thirteen to seven SLAMS monitors. See the Summary of 2016 Network Modifications section for details concerning the changes made to the CO network.

In 2016, no exceedances of the 1-hour or 8-hour CO NAAQS occurred at any MCAQD sites, and concentrations remained well below NAAQS levels. Since 1-hour CO concentrations have been significantly lower than the NAAQS level for many years, we have not included this metric on a table. Table 10 shows the maximum and second highest 8-hour CO averages measured.

Table 10. 2016 8-hour CO Average Data Summary

Site	CO 8-hour Average Max. (ppm)	CO 8-hour Average 2 nd Highest (ppm)
Buckeye	0.4	0.4
Central Phoenix	2.5	1.8
Diablo	1.5	1.5
*Dysart	0.5	0.5
*Glendale	1.7	1.2
*Greenwood	2.2	1.9
Mesa	1.5	1.5
*North Phoenix	1.2	1.0
**South Phoenix	2.3	1.6
*South Scottsdale	1.8	1.4
*Tempe	1.8	1.1
***Thirty-Third	2.6	2.4
West Chandler	1.4	1.4
West Phoenix	3.2	2.4

* Discontinued SLAMS monitor

** SLAMS monitor sampling schedule changed to year-round

*** SPM operated temporarily for 1st Quarter 2016

Source: EPA AQS database – 2016 *Quicklook Criteria Report (AMP450)*

Table 11 shows additional CO information required by EPA.

Table 11. 2016 CO Data Required by EPA

CBSA	Population & Census Year (2012)	Required Near-Road Monitors	Active Near-Road Monitors	Additional Near-Road Monitors Needed
38060	4,329,534	1	1	0

Source: U.S. Census 2012

Nitrogen Dioxide (NO_x)

Figure 8 shows the six NO₂ monitoring sites operating in 2016. The quantity decreased from six to five when the Greenwood monitor's operation discontinued in June. The NO₂ monitors are designated as SLAMS. Data from the six monitors were reported to AQS, and the data are suitable for comparison to the NAAQS.

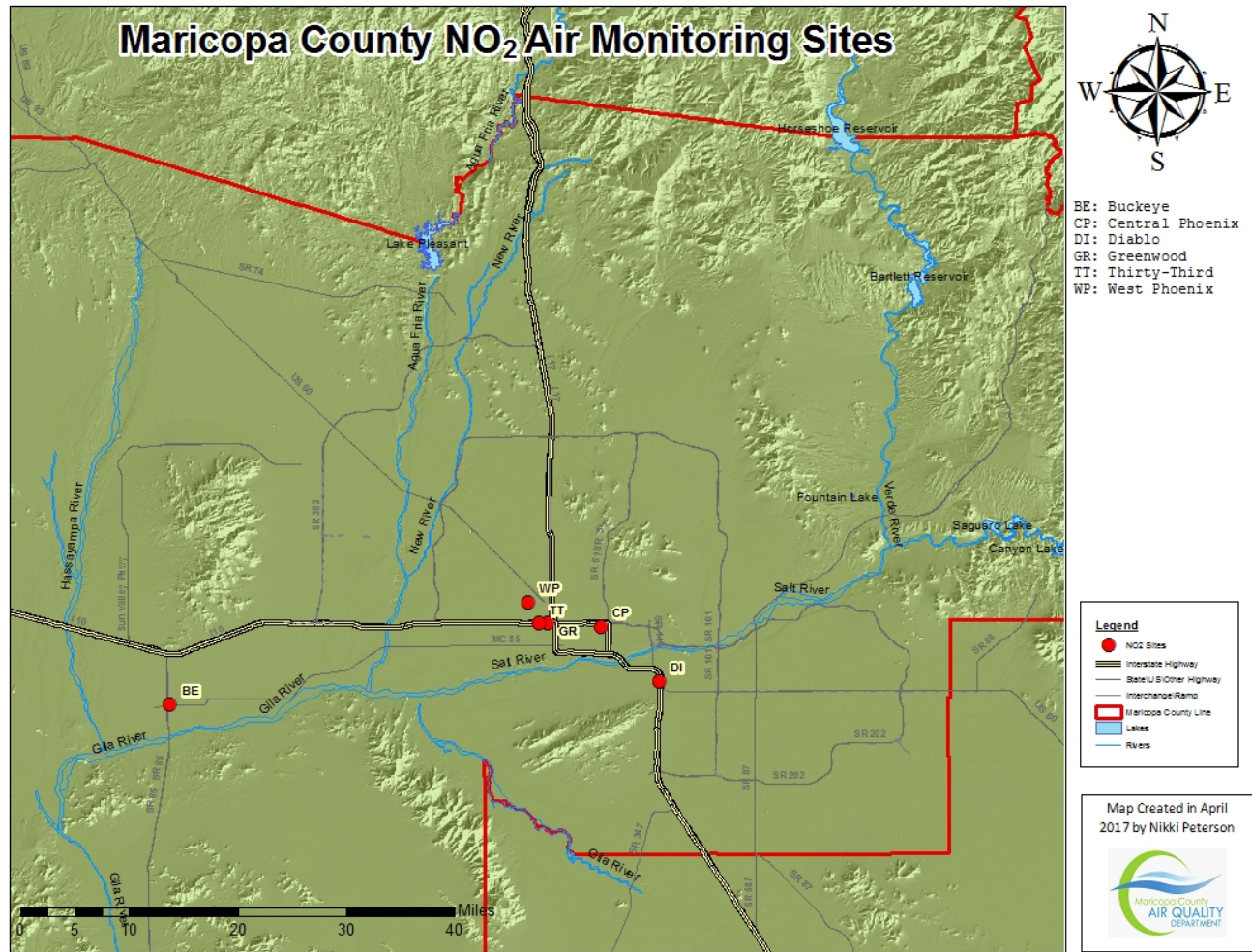


Figure 8. 2016 NO₂ Monitoring Site Map

Maricopa County is in attainment for NO₂. Compliance with the NO₂ standard is achieved when the annual arithmetic mean concentration in a calendar year is less than or equal to 53 ppb. A new hourly standard for NO₂ began in 2010; this regulation states that the 3-year average of the 98th percentile cannot exceed 100 ppb. Table 12 shows that no exceedances of the NO₂ annual or 1-hour NAAQS were recorded at Maricopa County monitoring sites in 2016.

Table 12. 2016 NO₂ 1-hour Data Summary

Site Name	NO ₂ Maximum (ppb)	NO ₂ . 98 th Percentile (ppb)	NO ₂ 3-Year Average of the 98 th Percentiles (ppb)	NO ₂ Annual Average (ppb)
Buckeye	34.0	29.0	33.3	6.90
Central Phoenix	62.0	59.0	59.3	17.34
Diablo	61.0	54.0	55.3	21.47
Greenwood	62.0	59.0	61.3	22.07†
Thirty-Third	77.0	63.0	63.5†	30.89
West Phoenix	66.0	54.0	55.3	16.24

† Data do not meet minimum summary data criteria. †† based on two years of data.

Source: EPA AQS database - 2014 – 2016 *Quicklook Criteria Report (AMP450)*

Currently, MCAQD is working with EPA R9 personnel to designate the “RA40” NO₂ monitor, since Greenwood’s has served that purpose historically. We have suggested that the West Phoenix NO₂ monitor would be a suitable choice.

Additional information required by EPA is shown in Table 13. The annual average daily traffic (AADT) is based on 2011 modeling data. The maximum traffic count location is just south of the Broadway Curve, before Southern Avenue, on the I-10.

Table 13. 2016 NO₂ Data Required by EPA

CBS A	Population & Census Year (2012)	Max AADT Counts	Required Near-Road Monitors	Active Near-Road Monitors	Additional Near-Road Monitors Needed	Required Area-Wide Monitors	Active Area-Wide Monitors	Additional Area-Wide Monitors Needed
38060	4,329,534	287,481	2	2	0	1	4	0

Ozone (O₃)

Figure 9 shows the eighteen O₃ monitors operating during 2016. The O₃ monitors are designated as SLAMS. The data were reported to AQS, and data are suitable for use with NAAQS comparisons.

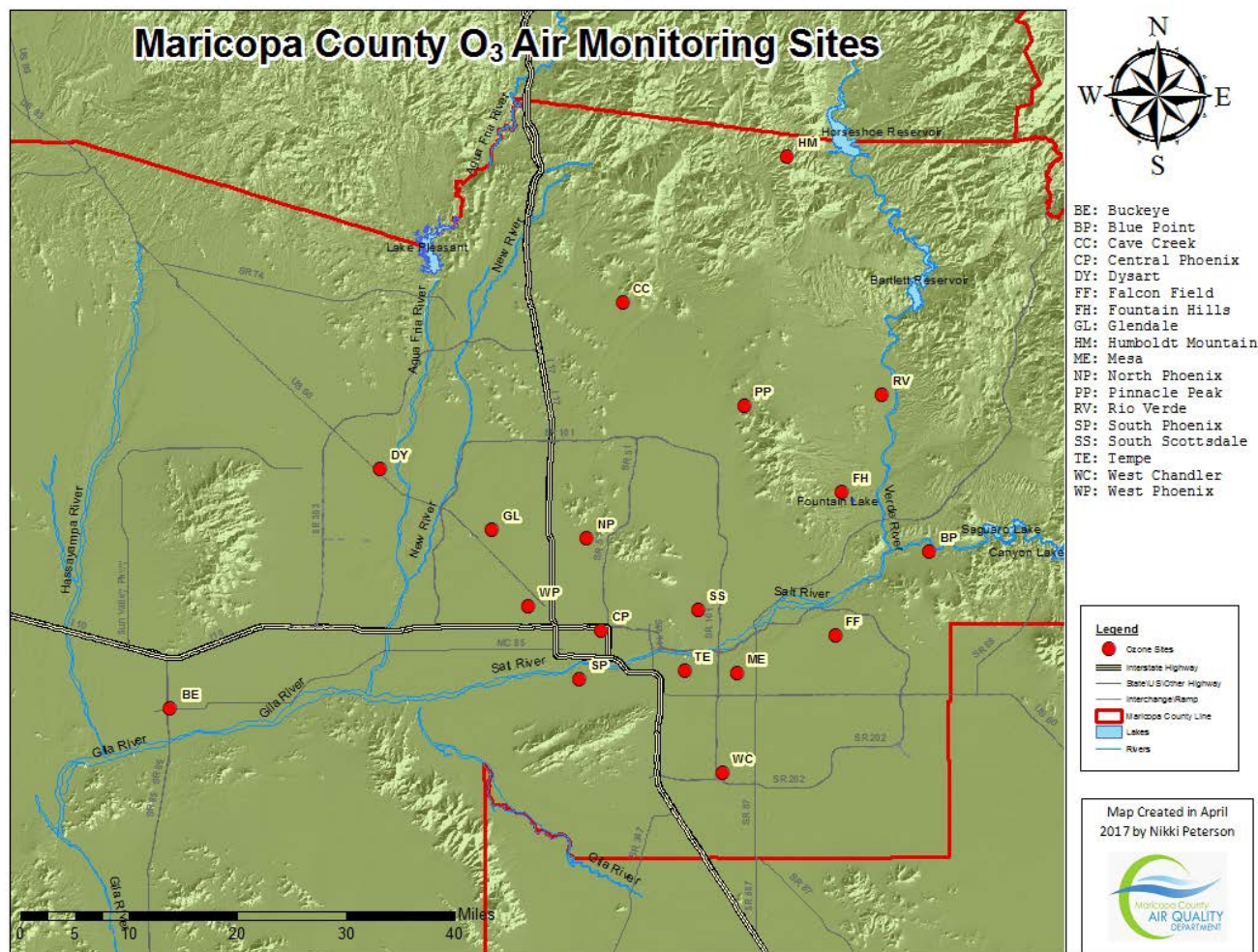


Figure 9. 2016 O₃ Monitoring Site Map

As stated in the O₃ summary, compliance with the NAAQS is determined by averaging the fourth highest 8-hour average over a 3-year period. Currently, this 3-year average must be less than or equal to 0.070 ppm. In 2016, twenty-six days exceeded the new 2015 8-hour primary standard for O₃.

Table 14 presents the 2016 8-hour O₃ data summary from MCAQD monitoring sites. There were eight violations of the 2015 8-hour primary standard. The 8-hour NAAQS is violated when a 3-year average using the fourth highest concentration measured in each year exceeds 0.070 ppm.

Table 14. 2016 8-hour Average O₃ Data Summary

Site	8-hr Max. (ppm)	2 nd Highest (ppm)	3 rd Highest (ppm)	4 th Highest (ppm)	Qty. of Days > 0.070 ppm
Blue Point	0.074*	0.073*	0.072*	0.071*	4
Buckeye	0.064	0.061	0.060	0.059	0
Cave Creek	0.073*	0.072*	0.071*	0.071*	5
Central Phoenix	0.072*	0.071*	0.071*	0.070	3
Dysart	0.069	0.067	0.064	0.063	0
Falcon Field	0.078*	0.077*	0.077*	0.073*	5
Fountain Hills	0.069	0.069	0.068	0.068	0
Glendale	0.071*	0.070	0.067	0.066	1
Humboldt Mt.	0.077*	0.073*	0.073*	0.072*	7
Mesa	0.079*	0.076*	0.075*	0.075*	14
North Phoenix	0.078*	0.076*	0.076*	0.075*	11
Pinnacle Peak	0.076*	0.075*	0.074*	0.074*	11
Rio Verde	0.075*	0.072*	0.071*	0.070	3
South Phoenix	0.071*	0.070	0.068	0.067	1
South Scottsdale	0.075*	0.075*	0.072*	0.070	3
Tempe	0.071*	0.069	0.068	0.068	1
West Chandler	0.072*	0.071*	0.071*	0.069	3
West Phoenix	0.073*	0.073*	0.071*	0.071*	6

* Indicates an exceedance of the standard

Source: EPA AQS database — 2016 *Quicklook Criteria Report (AMP450)* and 2016 *Maximum Values Report (AMP440)*

Table 15 shows additional information required by EPA.

Table 15. 2016 O₃ Data Required by EPA

CBSA	38060
County	Maricopa
Population & Census Year (2012)	4,329,534
3-Year Design Value	0.077 ppm
3-Year Design Value Site	04-013-2005 (Pinnacle Peak – MCAQD)
MCAQD Max 8-Hour Concentration	0.079 ppm
MCAQD Max Concentration for Site	04-013-1003 (Mesa – MCAQD)
MSA Max 8-Hour Concentration	0.079 ppm
MSA Max Concentration Site	04-013-1003 (Mesa – MCAQD)
Required Monitors	3
Active Monitors	18
Additional Monitors Needed	0

Source: EPA AQS database – 2016 Design Value Report (AMP480) and 2016 Quicklook Criteria Report (AMP450)

Lead (Pb)

Figure 10 shows the Deer Valley site, which is the only site monitoring for Pb. Two Pb monitors are required at the Deer Valley Airport for QA purposes and both monitors are designated as SLAMS. The data were reported to AQS, and data are suitable for use with NAAQS comparisons.

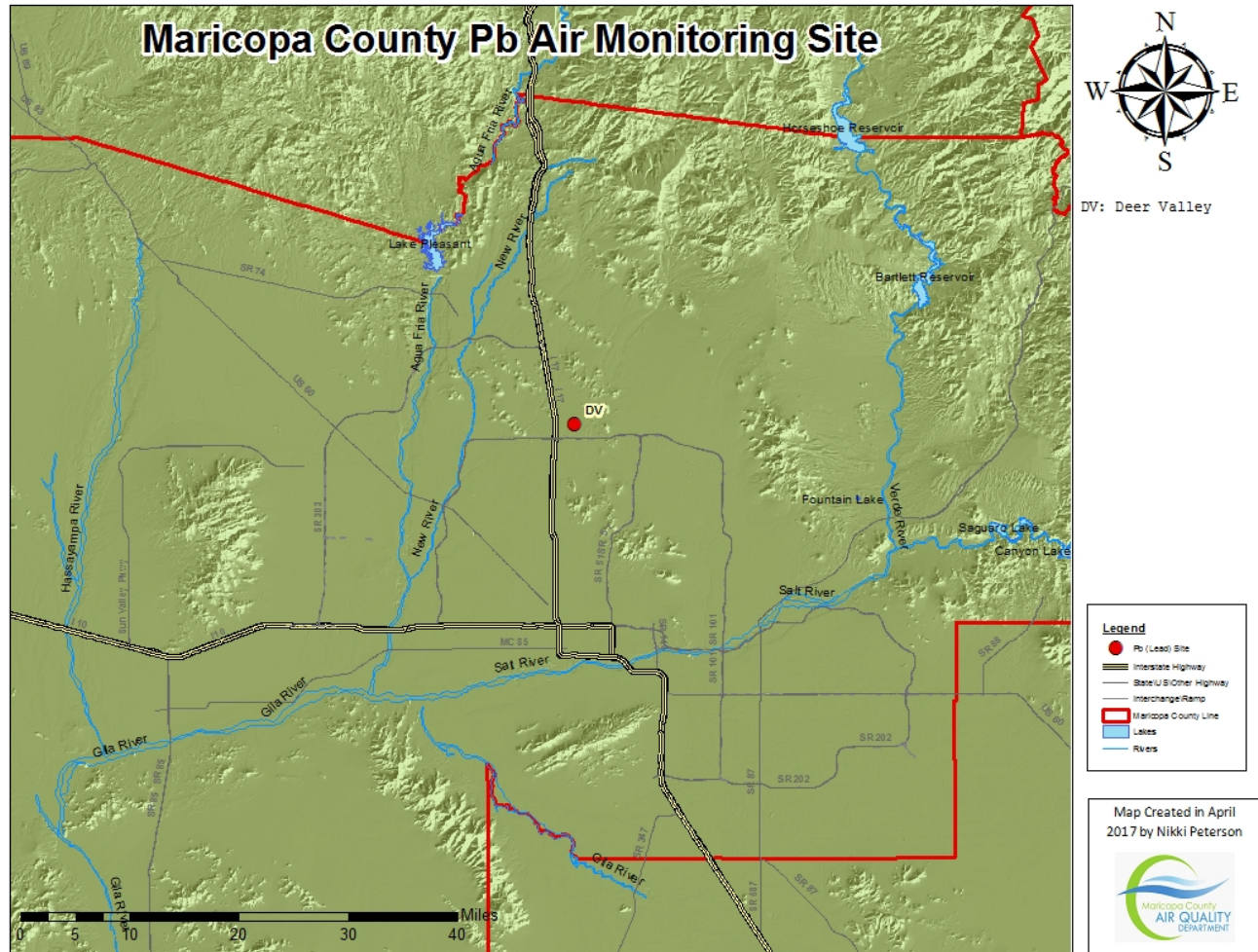


Figure 10. 2016 Pb Monitoring Site Map

In July 2010, this Pb monitoring site opened near the Deer Valley Airport in north Phoenix. This airport is one of the busiest general aviation airports in the region, and it serves a significant number of propeller-driven aircraft, which still use Pb-containing general aviation fuel unlike jet engine-driven aircraft.

The primary and secondary Pb NAAQS standards are identical. The rolling 3-month average is violated by an exceedance of $0.15 \mu\text{g}/\text{m}^3$. Table 16 shows a summary of the 2016 Pb data required by EPA.

Table 16. 2016 Pb Data Summary

Site	24-hour Max. ($\mu\text{g}/\text{m}^3$)	24-hour 2 nd Highest ($\mu\text{g}/\text{m}^3$)	Max. 3-month Rolling Quarterly Average ($\mu\text{g}/\text{m}^3$)	Number of Samples
Deer Valley	0.073	0.072	0.05	58

Source: EPA AQS database – 2016 *Quicklook Criteria Report (AMP450)*

According to the 2011 EPA’s National Emission Inventory, Deer Valley Airport remains the largest point-source of Pb within Maricopa County that triggers the EPA 1.0 ton per year (tpy) threshold for Pb emissions, which are shown on Table 17.

Table 17. 2016 Pb Data Required by EPA

Source Name	Location	2011 Pb Emission (tpy)	Emissions Inventory Source & Data Year	Max 3-Month Design Value ($\square\text{g}/\text{m}^3$)	Design Value Date	Required Monitors	Active Monitors	Additional Monitors Needed
Deer Valley Airport	Phoenix, AZ	1.16	General Aviation Airport 2011	0.05	December 2016	1	1	0

Sources: The EPA [2011 National Emissions Inventory \(NEI\) Report](#)
EPA AQS database – 2016 *Design Value Report (AMP480)*

Particulate Matter ≤ 10 Micrometers (PM_{10})

Figure 11 shows the sixteen PM_{10} monitors operating during 2016. The quantity of PM_{10} monitors reduced from sixteen to fifteen when Greenwood's monitor discontinued operation in June. The PM_{10} monitors are designated as SLAMS, and data are suitable for comparison to the NAAQS.

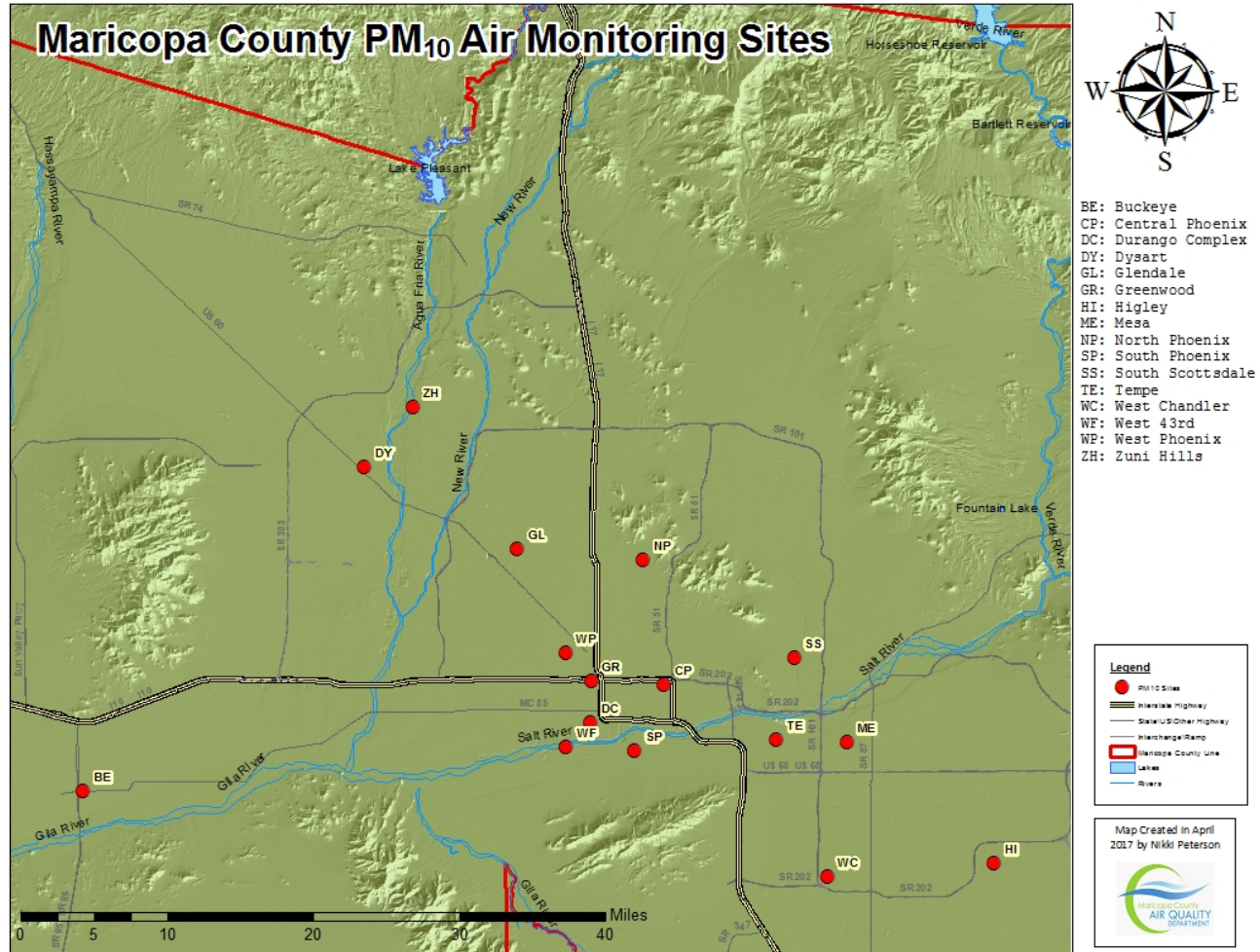


Figure 11. 2016 PM_{10} Monitoring Site Map

All PM_{10} monitoring stations operate continuous PM_{10} analyzers that collect hourly-averaged data. It is worth noting that EPA does not require PM_{10} analyzers to be collocated at the PQA level or the national level.

The PM_{10} NAAQS are violated when the expected number of exceedances at a monitor is more than one per year on average over three years. The expected number of exceedances for a site is estimated using a formula provided in *40 CFR Part 50 Appendix K*. The formula takes into account the number of days sampling occurs and the number of valid samples that can be collected. A 3-year average of these estimated days is then used to determine compliance. Effective December 18, 2006, EPA revoked the PM_{10} annual primary standard; however, the annual weighted average is displayed for informational purposes (see Table 18).

In recent years, some PM_{10} exceedances occurring in the Maricopa County CBSA have been successfully attributed to an EE. Again, as per the EPA's *EER*, an EE is an uncontrollable event that was caused by

natural sources of pollution or an event that is not expected to recur at a given location. ADEQ makes the determination of which events to classify as exceptional; then, they submit documentation to EPA supporting the contention that the exceedance(s) was due to an EE. If EPA R9 concurs, the PM₁₀ concentrations measured during the event are not used to determine compliance with the NAAQS. The EE counts below are current as of this review's publishing. Table 18 shows the 2016 PM₁₀ 24-hour NAAQS status and data summary, including EE data values.

Table 18. 2016 PM₁₀ 24-Hour Data Summary Including EE Data

Site Name	24-hr Avg. Max (µg/m ³)	24-hr Avg. 2 nd High (µg/m ³)	24-hour NAAQS Exceedances	Expected Exceedances	Annual Weighted Avg. (µg/m ³)	Quantity of EEs
Buckeye	153	134	0	0	40.2	0
Central Phoenix	106	102	0	0	32.6	0
Durango Complex	112	109	0	0	33.0	0
Dysart	173	126	1	1	28.8	1
Glendale	180	161	2	2	22.1	2
Greenwood	108	105	0	0	40.8†	0
Higley	<i>Note: No data available due to this site remaining temporarily closed in 2016.</i>					
Mesa	100	97	0	0	21.1	0
North Phoenix	141	76	0	0	20.7	0
South Phoenix	130	85	0	0	31.1	0
South Scottsdale	115	113	0	0	28.2	0
Tempe	77	71	0	0	21.8	0
West Chandler	134	123	0	0	29.7	0
West 43 rd Avenue	174	127	1	1	46.9	1
West Phoenix	172	138	1	1	28.9	1
Zuni Hills	174	140	1	1	26.5	1

† Data do not meet completeness criteria.

Source: EPA AQS database - 2016 Quicklook Criteria Report (AMP450)

Table 19 shows additional information required by EPA. Data include measurements submitted as EEs.

Table 19. 2016 PM₁₀ Data Required by EPA

CBSA	38060
County	Maricopa
Population & Census Year (2012)	4,329,534
MCAQD Max 24-Hour Concentration	180 µg/m ³
MCAQD Max Concentration for Site	04-013-2001 (Glendale)
MSA Max 24-Hour Concentration	1,367 µg/m ³
MSA Max Concentration Site	04-021-3015 (Stanfield - PCAQCD)
Required Monitors	6-10
Active Monitors	16
Additional Monitors Needed	0

Source: EPA AQS database - 2016 *Quicklook Criteria Report (AMP450)*

Particulate Matter ≤ 2.5 Micrometers ($PM_{2.5}$)

Figure 12 shows the nine $PM_{2.5}$ sites operating during 2016. All $PM_{2.5}$ monitors, except for the Thirty-Third's monitor, are designated as SLAMS. The Thirty-Third monitor was designated as a SPM, because it temporarily supported the $PM_{2.5}$ winter chemical speciation study. The quantity of monitors decreased from nine to eight in April after the Thirty-Third SPM was discontinued.

The $PM_{2.5}$ monitoring network is representative of "area-wide" air quality in respect to fine particulate with the exception of the monitor at Diablo, which is a near-road monitoring site. At Diablo, the $PM_{2.5}$ monitor collects source-oriented emissions from vehicular traffic and represents the microscale. Data were reported to AQS, and data are suitable for comparison to the NAAQS.

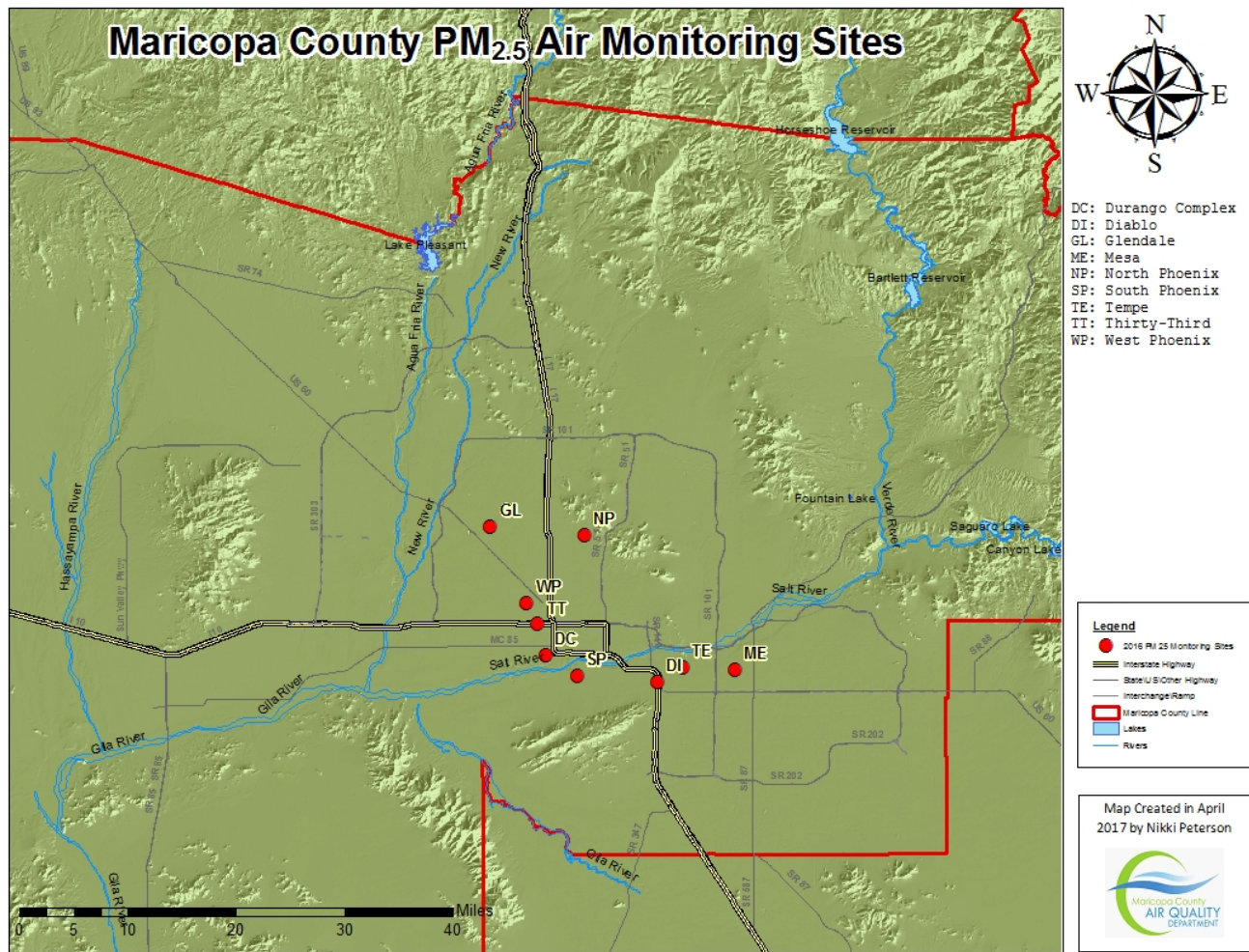


Figure 12. 2016 $PM_{2.5}$ Monitoring Site Map

Each $PM_{2.5}$ sites operates a continuous FEM monitor that provides hourly concentration data used for NAAQS comparison. The West Phoenix site remains our "collocated" site for $PM_{2.5}$, which means that we operate one FEM continuous analyzer designated as the "primary monitor" and one FRM filter-based $PM_{2.5}$ sampler designated as the "secondary monitor". The FRM sampler collects a filter sample every 12 days for QA purposes. The secondary monitor is required to meet the EPA's QA collocation requirements for the $PM_{2.5}$ network.

The EPA may reference data from the secondary monitor to better evaluate air quality in the area. In addition, to the secondary monitor's data being used for QA purposes, if necessary, the data can be substituted for the primary monitor's data as per *40 CFR Part 50 Appendix N*. This secondary monitor collects a 24-hour, e.g., midnight-to-midnight, filter sample on the designated 1:12 day schedule as required for collocated QA samples. The EPA OAQPS produces the [annual sampling calendar](#) each year and posts it on the AMTIC website.

Maricopa County is currently in attainment for PM_{2.5}. The MCAQD continually assesses the existing network to ensure it adequately represents air quality in Maricopa County with regard to PM_{2.5}. To determine compliance with the annual PM_{2.5} NAAQS requires that three years of the 24-hour annual average data be used from each monitor. To determine compliance with the 24-hour NAAQS requires that three years of the 98th percentile data be used from each PM_{2.5} monitor. For data to be acceptable for comparison to the annual and the 24-hour NAAQS, a site's PM_{2.5} monitor must meet all EPA-required operating and QA criteria.

2016 PM_{2.5} Data Summary

Table 20 summarizes the 2016 data from the primary monitors only.

Table 20. 2016 PM_{2.5} 24-Hour and Annual Averages

Site Name	2016 24-hr Avg. Max (µg/m ³)	2016 24-hr Avg. 2 nd High (µg/m ³)	2016 98 th Percentile Value (µg/m ³)	2016 Annual Avg. (µg/m ³)
Diablo	62.7*	22.3	16.6	7.8
Durango Complex	64.2*	39.4*	22.7	9.4
Glendale	113.9*	40.8*	17.7	6.7
Mesa	83.0*	18.3	14.0	6.7
North Phoenix	52.2*	20.4	16.3	6.4
South Phoenix	108.0*	28.7	22.8	8.4
Tempe	59.2*	20.5	14.9	6.8
Thirty-Third	119.1*	30.0	30.0	13.5†
West Phoenix	152.1*	33.7	23.8	8.7

* Indicates an exceedance of the standard.

† Indicates that the mean does not satisfy data completeness criteria

Source: EPA AQS database - 2016 *Quicklook Criteria Report (AMP450)*

The Annual PM_{2.5} NAAQS Status

Compliance with the primary and secondary annual NAAQS is determined by averaging three consecutive years of a site’s annual mean value using the 24-hour, or daily, concentrations. The annual PM_{2.5} NAAQS is met when three-year annual average concentration is less than or equal to 12.0 µg/m³ at each eligible monitoring site. All 3-year averages were below the annual NAAQS. Table 21 summarizes the 3-year 24-hour annual average data.

Table 21. PM_{2.5} 3-Year Annual Averages

Site Name	2014 Annual Avg. (µg/m ³)	2015 Annual Avg. (µg/m ³)	2016 Annual Avg. (µg/m ³)	3-Year Annual Avg. (µg/m ³)
Diablo	9.71†	7.86	7.89	7.87†
Durango Complex	10.12	8.97	9.48	9.52
Glendale	7.73	7.0	6.75	7.16
Mesa	8.28	6.68	6.75	7.23
North Phoenix	8.02	6.73	6.47	7.07
South Phoenix	10.27	8.99	8.45	9.23
Tempe	8.63	8.88†	6.84	7.73†
*Thirty-Third	Not operating	10.48†	13.58†	12.03†
West Phoenix	10.9	8.6	8.78	9.42

† Indicates that the mean does not satisfy data completeness criteria.

* Monitor only operated from January to March in 2016

Source: EPA AQS database - 2014 – 2016 Design Value Report (AMP450)

2015 24-Hour PM_{2.5} NAAQS Status

Compliance with the primary and secondary 24-hour PM_{2.5} NAAQS is determined by averaging 3-consecutive years of the 24-hour 98th percentile concentration values from all eligible sites. The 24-hour NAAQS is met when 3-year average concentration values is less than or equal to 35 µg/m³. In 2015, there were three exceedance days, but no violations of the primary or secondary 24-hour NAAQS of 35 µg/m³. Table 22 summaries the 3-year 24-hour 98th percentile data from the FEM analyzers.

Table 22. PM_{2.5} 3-Year 24-Hour Averages of the 98th Percentile

Site Name	2014 98 th Percentile (µg/m ³)	2015 98 th Percentile (µg/m ³)	2016 98 th Percentile (µg/m ³)	3-Year Average 98 th Percentile (µg/m ³)
Diablo	21.4†	17.0	16.6	18.3
Durango Complex	24.1	27.1	22.7	24.6
Glendale	18.6	18.9	17.7	18.4
Mesa	19.4	16.6	14.0	16.6
North Phoenix	20.3	17.8	16.3	18.1
South Phoenix	26.5	27.7	22.8	25.6
Tempe	17.4	16.9†	14.9	16.4
*Thirty-Third	Not operating	34.0†	30.0†	32.0†
West Phoenix	28.9	27.5	23.8	26.7

† Indicates that the mean does not satisfy data completeness criteria.

* Monitor operated from January to March in 2016 only

Source: EPA AQS database - 2016 Design Value Report (AMP480)

Table 23 shows additional information required by EPA. The PM_{2.5} annual and daily design values include any measurements submitted as an EE for EPA's concurrence. In 2016, there were no EEs submitted for PM_{2.5} exceedances. Maricopa County operates more than the required minimum number of PM_{2.5} monitors for the core-based statistical area (CBSA).

Table 23. 2016 PM_{2.5} Data Required by EPA

CBSA	38060
County	Maricopa
Population & Census Year (2012)	4,329,534
Annual Design Value	9.5 µg/m ³
Annual Design Value Site	04-013-9812 (Durango Complex – MCAQD)
24-Hour Design Value	27 µg/m ³
24-Hour Design Value Site	04-013-0019 (West Phoenix – MCAQD)
MCAQD Max 24-Hour Concentration	152.1 µg/m ³
MCAQD Max Concentration for Site	04-013-0019 (West Phoenix – MCAQD)
MSA Max 24-Hour Concentration	152.1 µg/m ³
MSA Max Concentration Site	04-013-0019 (West Phoenix – MCAQD)
Required Monitors	3
Active Monitors	8
Additional Monitors Needed	0

Source: EPA AQS database - 2016 Design Value Report (AMP480) and 2016 Quicklook Criteria Report (AMP450)

Sulfur Dioxide (SO₂)

Figure 13 shows the two SO₂ SLAMS monitors operating in 2016. The data were reported to AQS, and the data are suitable for NAAQS comparison.

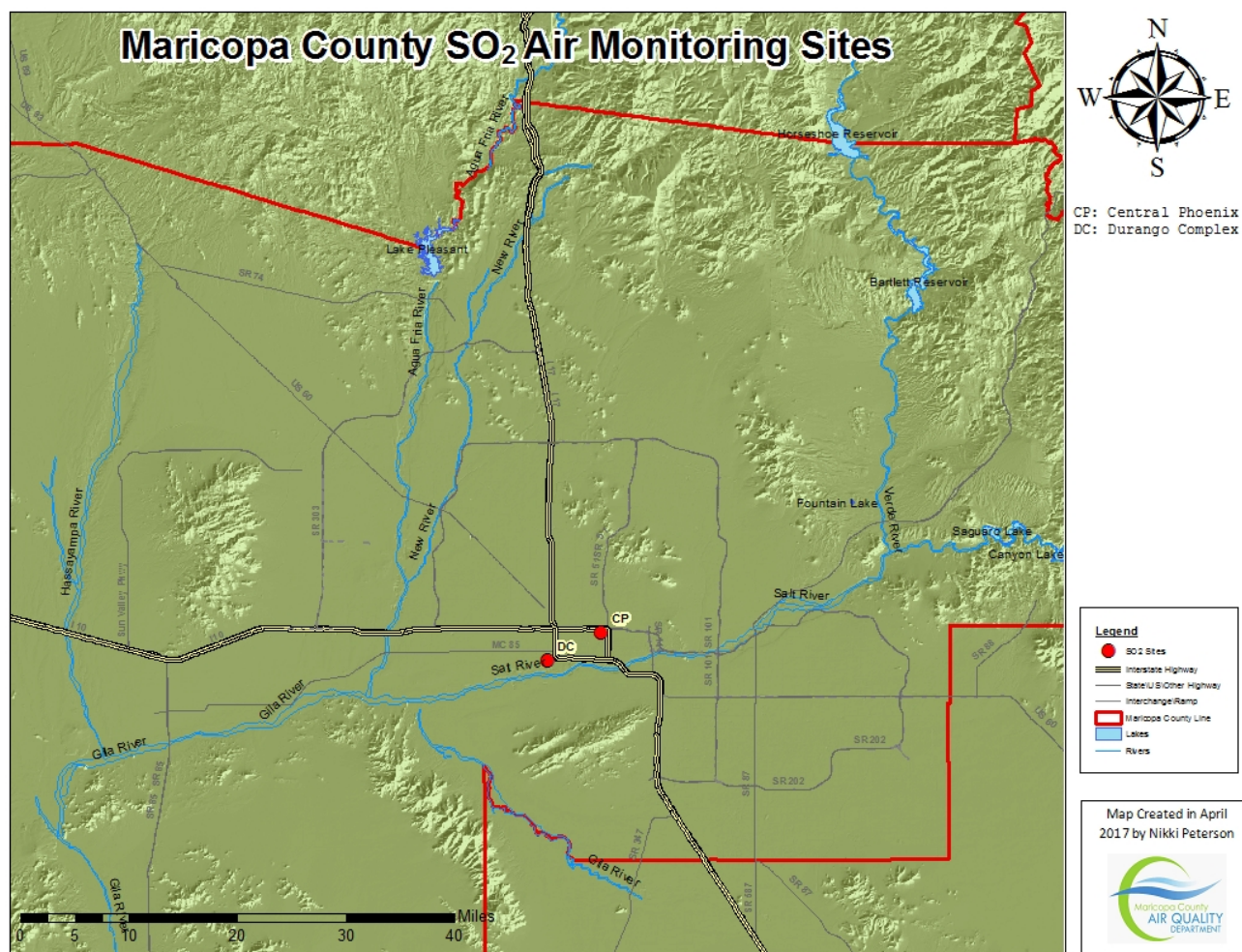


Figure 13. 2016 SO₂ Monitoring Site Map

Sulfur dioxide has a 1-hour primary standard and a 3-hour secondary standard. The 24-hour and annual average standards were revoked in a June 2010 rulemaking. A violation of the primary standard occurs when the 3-year average of the 99th percentile of the daily maximum 1-hour average exceeds 75 ppb. A violation of the secondary standard occurs when a 3-hour average of 500 ppb is exceeded more than once per year. Maricopa County is in attainment for SO₂.

For calendar year 2016, no exceedances of the SO₂ 1-hour or 3-hour standard were recorded at Maricopa County monitoring sites. The EPA now requires that the highest 5-minute average per hour per day be reported to AQS; however, there is not a 5-minute SO₂ NAAQS level. The EPA no longer requires the reporting of 3-hour values for the SO₂ secondary NAAQS. Table 24 shows the 2016 SO₂ data summary.

Table 24. 2016 SO₂ Data Summary

Site	1-hour Max. (ppb)	1-hour 2 nd High (ppb)	1-hour 99 th Percentile (ppb)
Central Phoenix	8	7	6
Durango Complex	8	8	7

Source: EPA AQS database – 2016 *Quicklook Criteria Parameters Report (AMP450)*

The minimum required quantity of SO₂ monitors operating within the MCAQD’s network is based on either the Population Weighted Emissions Index (PWEI) and/or the EPA R9 Administrator’s input (see 40 CFR Part 58 - Appendix D 4.4.3).

Table 25 shows additional information required by EPA.

Table 25. 2016 SO₂ Data Required by EPA

CBSA	County	Population & Census Year (2012)	Total SO ₂ Emitted in 2011 (tpy)	Population Weighted Emission Index	Required Monitors	Active Monitors	Additional Monitors Needed
38060	Maricopa	4,329,534	1468	6355	0	2	0

Source: The [EPA’s Clearinghouse for Inventories & Emissions Factors \(CHIEF\)](#) database

2016 NAAQS Exceedances and Violation Summary

Table 26 summarizes the 2016 NAAQS exceedances and violations.

Table 26. 2016 NAAQS Exceedances and Violation Summary

Pollutant	NAAQS Status
CO	No exceedances or violations of the 1-hour or 8-hour primary NAAQS occurred.
NO₂	No exceedances or violations of the 1-hour primary NAAQS or the annual primary / secondary NAAQS occurred.
O₃	On twenty-six unique days, at least one monitor exceeded the new 2015 8-hour primary / secondary NAAQS. Eight violations of the 2015 8-hour primary / secondary NAAQS occurred.
Pb	No exceedances or violations of the 3-month primary / secondary NAAQS occurred.
PM₁₀	On six unique days, at least one monitor exceeded the 24-hour primary / secondary NAAQS, but no sites violated the NAAQS.
PM_{2.5}	On three unique days, at least one monitor exceeded the 24-hour primary / secondary NAAQS. No violation of the annual primary / secondary NAAQS occurred.
SO₂	No exceedances or violations of the 1-hour NAAQS occurred.

2016 Ozone Exceedance and Violation Information

Figure 14 shows the dates and concentrations for the 2015 primary and secondary 8-hour O₃ NAAQS exceedances. The NAAQS level of 0.070 ppm for a rolling 8-hour average, and an exceedance occurs when the 8-hour average is greater than 0.07 ppm, e.g., 0.071 ppm or higher.

Ozone Exceedance Days 2016

Ozone 8-hr avg. (ppm)
Ozone NAAQS > 0.070 ppm

	Buckeye	Blue Point	Cave Creek	Central Phoenix	Dysart	Falcon Field	Fountain Hills	Glendale	Humboldt Mt.	Mesa	North Phoenix	Pinnacle Peak	Rio Verde	South Phoenix	South Scotts.	Tempe	West Chandle	West Phoenix
4/20/16			0.071															
4/21/16			0.071															
4/24/16			0.073										0.075					
5/2/16											0.071							
5/12/16									0.071		0.072							0.071
5/13/16		0.073				0.073						0.072	0.071					
5/23/16									0.072			0.073						
5/27/16		0.072								0.071		0.072						
5/28/16			0.072						0.072	0.074	0.072	0.074	0.072					0.071
5/30/16									0.072									
6/2/16												0.071						
6/5/16										0.073	0.072						0.071	
6/6/16									0.071									
6/7/16			0.071						0.077									
6/8/16												0.071						
6/19/16										0.071								0.071
6/27/16				0.071						0.075	0.072							
6/28/16		0.071		0.071		0.078				0.073	0.075	0.076			0.075			0.073
7/20/16								0.071		0.075	0.076	0.071		0.071				0.073
7/21/16		0.074				0.077				0.079	0.072	0.074				0.071	0.072	
7/28/16				0.072		0.077				0.074	0.078				0.075			
7/30/16						0.071			0.073	0.071	0.076	0.072					0.071	
8/13/16										0.076					0.072			
8/15/16										0.073	0.071	0.075						
8/18/16										0.073								0.071
8/21/16										0.072								
Exceedance Days		4	5	3		5		1	7	14	11	11	3	1	3	1	3	6
Maximum Value		0.074	0.073			0.078			0.077	0.079	0.078	0.076	0.075				0.072	0.073
4th High Value > .070		0.071	0.071			0.073			0.072	0.075	0.075	0.074						0.071

All sites are located in or near the Ozone Nonattainment Area
Please see ADEQ for information on additional statewide ozone sites

Total Number of Days where at least one monitor exceeded the NAAQS Ozone Standard	26
---	-----------

Figure 14. 2016 O₃ Exceedance Days

A site violates the O₃ NAAQS when its 3-year average of the 4th-highest annual 8-hour concentration exceeds 0.070 ppm. Data shown below are the 2014 to 2016 3-year averages of the fourth highest 8-hour O₃ concentrations. The concentrations shown include the June 20, 2015 O₃ data that has been flagged as an EE. Figure 15 shows a graph of the 2008 O₃ violations from 2016.

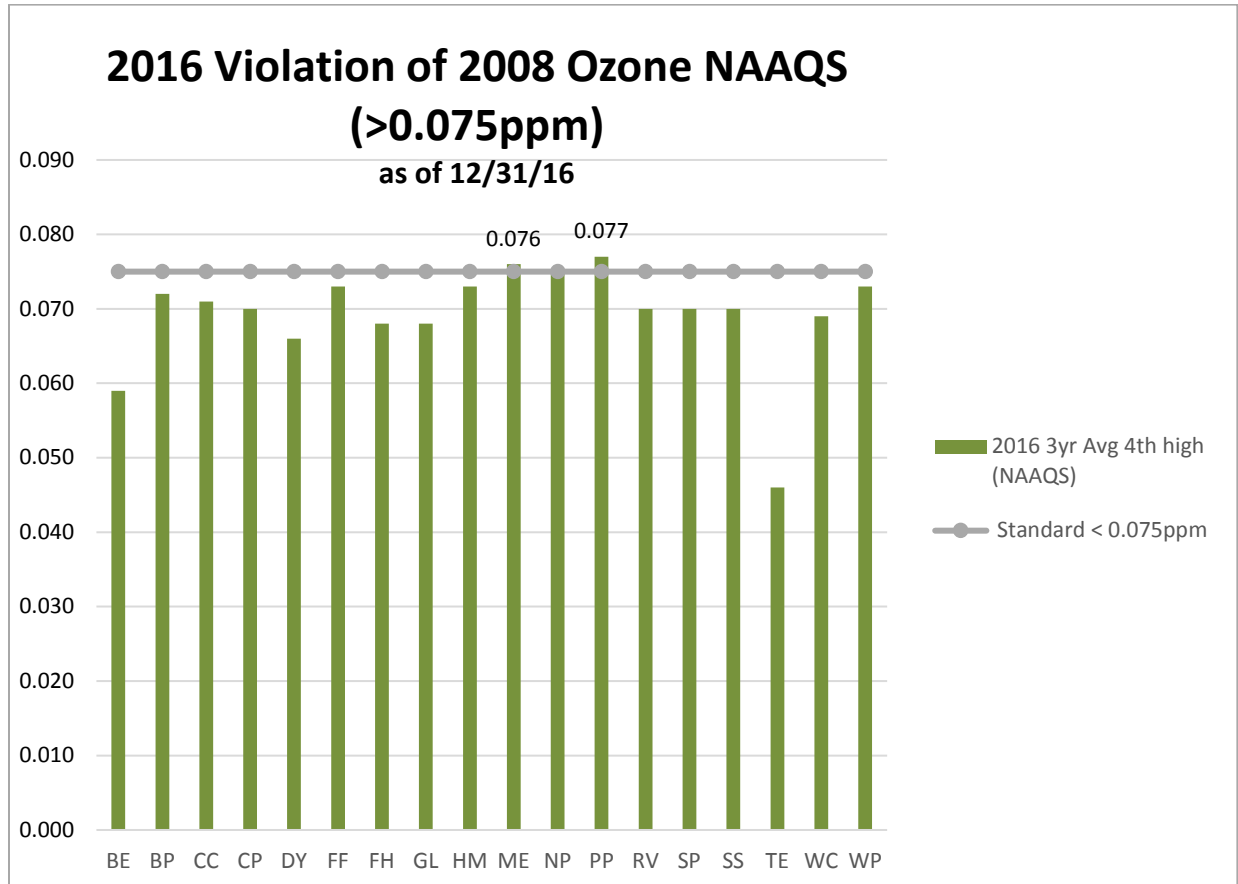


Figure 15. 2016 O₃ Violations based on 2008 NAAQS

If we compare the 2014 – 2016 data to the newly lowered O₃ NAAQS of 0.070 ppm, then eight sites violated the 2015 O₃ NAAQS as shown on Figure 16. The concentrations shown include the June 20, 2015 O₃ data that has been flagged as an EE. The EPA must concur with EE demonstration packages for before omitting data from NAAQS comparisons.

2016 Violation of 2015 Ozone NAAQS (>0.070ppm)

as of 12/31/16

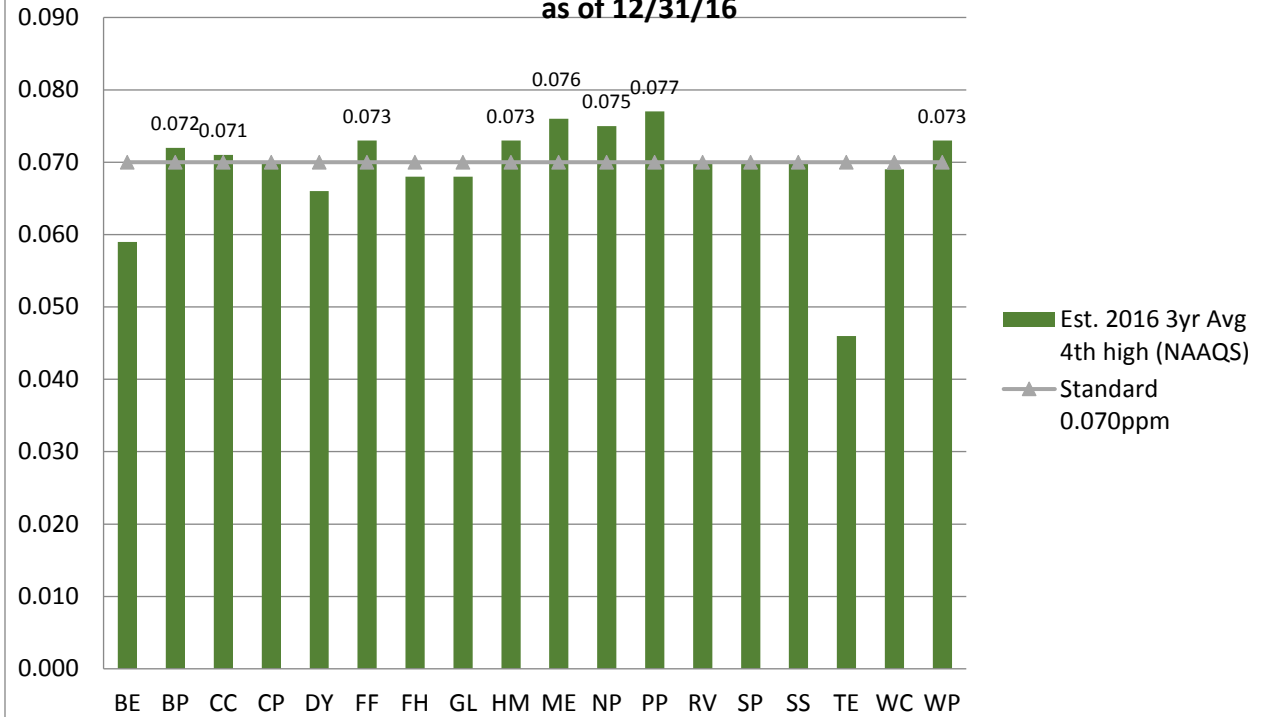


Figure 16. 2016 O₃ Violations based on 2015 NAAQS

2016 Particulate Matter Exceedances, Violations, and Exceptional Event Status

2016 PM₁₀ NAAQS Exceedances

Table 27 shows the site and date of PM₁₀ exceedances that occurred in 2016. Again, a PM₁₀ exceedance is based on a 24-hour sample from midnight-to-midnight. An EE package has been or is being developed and submitted to EPA for the six exceedances shown below.

Table 27. 2016 PM₁₀ 24-hour NAAQS Exceedances

Site	Date	24-hour Avg. PM ₁₀ Concentration (µg/m ³)	Exceptional Event
Dysart	05/17/16	173	*
Glendale	09/27/16	180	*
	09/28/16	161	*
West 43 rd Avenue	04/25/16	174	*
West Phoenix	01/01/16	172	*
Zuni Hills	07/29/16	174	*
Quantity of Days in 2016 where at least one monitor <u>exceeded</u> the 24-hr PM₁₀ Standard		6	

* MCAQD flagged this exceedance as an EE in AQS.

Source: EPA AQS database – *2016 Maximum Values Report (AMP440)*

2016 PM₁₀ NAAQS Violation Status Including Exceptional Event Data

As per *40 CFR Part 50.6 (a)*, a site violates the primary and/or secondary 24-hour PM₁₀ NAAQS when the calculated “rate of expected exceedances” is greater than one (> 1) when averaged over three consecutive years.

Table 28 includes EE data and shows the three-year 24-hour maximum PM₁₀ averages, the calculation of expected exceedances for each year, and the calculation of three-year average for the rate of expected exceedances. If the EPA does not concur with the demonstration packages submitted for 2014 and 2016, then, in 2016, the Glendale site will violate the PM₁₀ NAAQS. Please note that the EPA has yet to determine concurrence or not with the 2014 and 2016 EE demonstration package submittals.

Table 28. 2016 Violations of the PM₁₀ 24-Hour NAAQS Including EE Data

Site	2014		2015		2016		3-Yr. Avg. Rate of Expected Exceedances
	24-hr Max. (µg/m ³)	Expected Exceedances	24-hr Max. (µg/m ³)	Expected Exceedances	24-hr Max. (µg/m ³)	Expected Exceedances	
Buckeye	271‡	2.0	124	0	153	0	0.66
Central Phoenix	182‡	1.0	114	0	106	0	0.33
Durango Complex	172‡	2.0	100	0	112	0	0.66
Dysart	163‡	1.0	99	0	173‡	1	0.33
Glendale	205‡	1.011	78	0	180‡	2.022	1.01
Greenwood	208‡	2.011	106	0	108†	0	0.67
Higley	179‡	2.0	Not Operating	Not Applicable	Not Operating	Not Applicable	0.66†
Mesa	155‡	1.034	66	0	100	0	0.34
North Phoenix	199‡	1.0	79	0	141	0	0.33
South Phoenix	170‡	3.0	86	0	130	0	1.0
South Scottsdale	193‡	2.045	86	0	115	0	0.68
Tempe	175‡	1.011	52†	0†	77	0	0.33†
West Chandler	163‡	1.0	121	0	134	0	0.33
West 43rd	171‡	1.0	132	0	174‡	1	0.66
West Phoenix	210‡	2.022	72	0	172‡	1	0.67
Zuni Hills	166‡	1.247	81	0	174‡	1	0.74

‡ Indicates value was flagged as an EE

† Indicates <75% data available, i.e., does not meet data completeness requirements

Source: EPA AQS database - 2014 - 2016 – *Quicklook All Parameters Report (AMP450NC)*

2016 24-Hour PM₁₀ NAAQS Violation Status Excluding Exceptional Event Data

The ADEQ submitted EE packages to EPA R9 for the six PM₁₀ exceedance days that occurred in 2016. There were no exceedance days in 2015 at Maricopa County sites. If the EPA concurs with all of the EE demonstration packages submitted for 2014 and 2016, the number of sites that violate the PM₁₀ NAAQS in 2016 will be zero. Data holding EE concurrence are not included when determining compliance with the NAAQS. Table 29 excludes the 2014 and 2016 PM₁₀ data considered the result of an EE, regardless of the EPA's concurrence status.

Table 29. 2016 Violations of the PM₁₀ NAAQS Excluding Data Flagged as an EE

Site	2014		2015		2016		3-Yr. Avg. Rate of Expected Exceedances
	24-hour Max. (µg/m ³)	Expected Exceedances	24-hour Max. (µg/m ³)	Expected Exceedances	24-hour Max. (µg/m ³)	Expected Exceedances	
Buckeye	175	1.00	124	0	153	0	0.33
Central Phoenix	135	0	114	0	106	0	0
Durango Complex	107	0	100	0	112	0	0
Dysart	90	0	99	0	126	0	0
Glendale	86	0	78	0	131	0	0
Greenwood	125	0	106	0	108†	0†	0†
Higley	137	0	Not Operating	0†	Not Operating	0†	0†
Mesa	101	0	66	0	100	0	0
North Phoenix	107	0	79	0	141	0	0
South Phoenix	109	0	86	0	130	0	0
South Scottsdale	98	0	86	0	115	0	0
Tempe	88	0	52†	0†	77	0	0†
West Chandler	146	0	121	0	134	0	0
West 43rd Avenue	121	0	132	0	127	0	0
West Phoenix	148	0	72	0	138	0	0
Zuni Hills	86	0	81	0	140	0	0

† Indicates < 75% data available, i.e., does not meet data completeness requirements

Source: EPA AQS database - 2016 Maximum Values Report (AMP440)

2016 24-Hour PM_{2.5} NAAQS Exceedances and Violation Status

The 24-hour primary and secondary NAAQS for PM_{2.5} are 35 µg/m³. If the 24-hour, midnight-to-midnight block-average concentration at a site is 35.5 µg/m³ or higher, then it is counted as an exceedance. If the 24-hour 3-year average of the 98th percentile exceeds 35 µg/m³, then the 24-hour NAAQS are violated. Table 30 shows there were three exceedance days in 2016 for PM_{2.5}; but there were no violations.

Table 30. 2016 PM_{2.5} Exceedances

Site	Date	24-hr Avg. PM _{2.5} Concentration (µg/m ³)
Diablo	01/01/16	62.7
Durango Complex	01/01/16	64.2
	03/16/16	36.4
Glendale	01/01/16	113.9
	07/22/16	40.8
Mesa	01/01/16	83.0
North Phoenix	01/01/16	52.2
South Phoenix	01/01/16	108.0
Tempe	01/01/16	59.2
Thirty-Third	01/01/16	119.1
West Phoenix	01/01/16	152.1
Number of Days where at least one monitor exceeded the 24-hour PM_{2.5} Standard		3

Summary of 2016 Network Modifications

This section reports on the network modifications made in 2016 as well as any future network modifications the MCAQD would like to make or must make for various reasons. Most modifications will require prior approval by EPA R9. The MCAQD's AMD strives to provide the most reliable and relevant air monitoring data to the public. Air quality issues are diverse and are of great interest to the citizens of Maricopa County. High-quality data are a cornerstone of developing and implementing effective SIPs, EE packages, and permits for new and existing sources. The 2015 AMNP included several network modifications mostly due to the completion of the 2015 assessment.

Summary of the 2015 Network Assessment Recommendations

In 2015, the MCAQD completed the second 5-Year Network Assessment as required by *40 CFR Part 58*. The assessment evaluated the performance of the monitoring network for the years 2010 – 2014. The assessment identified refinements to the air monitoring network, and potential changes for all the CP networks, except for Pb.

Some of the recommendations made in the assessment were included in the 2015 AMNP. Those were:

- discontinuing CO monitoring at seven sites due to the network being adequate to represent current CO concentrations (Dysart, Glendale, Greenwood, North Phoenix, South Phoenix, South Scottsdale, and Tempe);
- discontinuing the PM₁₀ and NO₂ monitoring at Greenwood due to pollutants being adequately represented by nearby monitor sites, specifically at West Phoenix, West 43rd, and Thirty-Third;
- discontinuing O₃ monitoring at Rio Verde due to O₃ being adequately represented by nearby monitor sites, specifically at Fountain Hills, Pinnacle Peak, and Yuma Frank (Fort McDowell); and,
- updating the site type and/or scales of representativeness classifications.

Following EPA approval, the MCAQD made the proposed network modifications above except for discontinuing the CO monitoring at South Phoenix and the O₃ monitoring at Rio Verde. The CO monitor at South Phoenix remains in-place and now operates on a year-round schedule. In addition, the seasonal CO monitors at Buckeye and Mesa also changed to a year-round monitoring schedule. This year, we are again proposing to discontinue O₃ monitoring at Rio Verde. Supporting information regarding the changes made in the past year follows.

For CO, EPA R9 approved discontinuing the CO monitoring at the proposed sites except at South Phoenix, which changed to a year-round monitoring schedule. The change did not compromise the CO network from meeting *40 CFR Part 58, Appendix D* requirements. The affected monitors closed May 1, 2016 following spring CO season. The CO monitoring site changes were supported because the monitors closed were:

- attaining the 1971 1-hour and 8-hour CO NAAQS from 2011 through 2015;
- not specifically required by an attainment or maintenance plan; and,
- had less than a 10% probability of exceeding 80% of the NAAQS during the next three years, e.g., 2016 - 2018.

For the Greenwood site (04-013-3010), the PM₁₀ and NO₂ monitoring was discontinued in June 2016 due these pollutants being adequately represented by nearby monitoring sites.

For the site type/objective and spatial scales of representativeness, these changes did not require EPA R9 approval. Therefore, we made the proposed changes as shown below and on the 2016 Site Metadata Tables in Appendix II.

A. Changes Made to Site Types/Objectives

- 1) CO
 - a. West Phoenix from 'Population Exposure' to 'Highest Concentration'
 - b. Buckeye from 'Population Exposure' to 'Upwind Background'
- 2) NO₂ Buckeye from 'Population Exposure' to 'Upwind Background'
- 3) O₃
 - a. North Phoenix from 'Population Exposure' to 'Max Ozone Concentration'
 - b. Fountain Hills from 'Max Ozone Concentration' to 'Population Exposure'
 - c. Humboldt Mountain from 'Max Ozone Concentration' to 'Extreme Downwind'
 - d. Buckeye from 'Population Exposure' to 'Upwind Background'
- 4) PM₁₀ Durango Complex from 'Highest Concentration' to 'Population Exposure'

B. Changes Made to Monitoring Scales (Spatial Scale Represented)

- 1) O₃ Buckeye from 'Neighborhood' to 'Urban'
- 2) PM_{2.5} Durango Complex from 'Middle' to 'Neighborhood'
- 3) PM₁₀ Durango Complex from 'Middle' to 'Neighborhood'

Additional 2016 Monitor and/or Site Information

The Higley site (04-013-4006) has not been operating since November 4, 2014 due to the property owner asking us to vacate the property. In 2016, the AMD secured use of the new site with the property owner. The new location is cattycorner to the old location and close enough geographically to use the same AQS site identification number. The site build-out commenced, but was not complete before the end of 2016. The site opened at its new location on March 21, 2017.

For the West Chandler site (04-013-4004), in the past few plans we had mentioned that the property owner had indicated that they needed us to vacate the property. The MCAQD is not currently anticipating a change for this site location, because the property use is not a problem currently.

Proposed Network Modifications

For the Rio Verde site (04-013-9706), this year's plan is again proposing to discontinue monitoring for O₃ at this site. The MCAQD would like to secure approval from EPA R9 for this network modification in 2017.

For the MCAQD monitoring network, EPA requested that we work with other MOs within the MSA/CBSA to develop a shared monitoring agreement as specified by EPA R9. This is to ensure that each pollutant's network is adequately represented throughout Maricopa and Pinal Counties, which is the MSA/CBSA geographical area. We will begin working with the state/local/tribal MOs in the area in 2017 to develop this agreement.

Information Regarding Maricopa County's Supplementary Air Monitoring Programs

Personnel who work mobile monitoring and emergency response meet the Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training and medical monitoring requirements as per the U.S. Occupational Safety and Health Administration (OSHA) *29 CFR 1910.120*. Personnel attend an annual refresher training to remain certified.

The Mobile Monitoring Program

The department received approval in late 2006 from the Maricopa County Board of Supervisors to start a “mobile monitoring” program. This program enables us to better respond to emergencies affecting air quality, to identify sources of air pollutants by performing localized air monitoring, and to collect and analyze hazardous air pollutant (HAP) samples. In addition, the program allows us to assist the Maricopa County Air Quality Compliance and Enforcement Division (MCAQCED) with the investigation and enforcement of air pollution regulations.

In 2016, the mobile monitoring unit did not respond to any air quality emergencies throughout Maricopa County such as heavy smoke from fires or toxic releases that threatened air quality.

Rapid Response Notification System (RRNS)

Maricopa County enjoys many days with clean air; however, there are days when PM₁₀, PM_{2.5}, or O₃ pollution levels approach or exceed the NAAQS. In particular, PM₁₀ and PM_{2.5} concentrations can build up quickly due to a high wind speed or a fire, respectively. Curtailing PM pollution from natural events is challenging; it requires advance planning and implementation of control mechanisms to reduce the likelihood of an exceedance. However, anthropogenic activities that cause high PM concentrations near a site can often be addressed. If a quickly developing PM event is not addressed, it could result in a NAAQS exceedance that may have been avoidable.

To help reduce PM concentrations, the MCAQD implemented an automated alarm system that triggers email notifications and/or telephone calls to subscribers when concentrations of PM₁₀ and PM_{2.5} escalate. Subscribers include, but are not limited to: MCAQD's compliance and air monitoring personnel as well as industrial source representatives who can take action to reduce PM emissions caused by their work activities. The AirVision™ database is programmed to trigger alerts for elevated PM₁₀ five-minute and hourly concentrations, and high PM_{2.5} five-minute concentrations. Immediately following an hourly or five-minute PM concentration surpassing an assigned notification level, a high importance alert is sent out via email, text, and/or telephone to employees, stakeholders, and/or customers. In addition, Maricopa County enforces a “no burn restriction” when a PM_{2.5} High Pollution Advisory (HPA) is issued by ADEQ.

The RRNS serves as a tool to manage high pollution events using a three-part system:

1. dissemination of as near real-time as possible air quality data to the community;
2. a notification system to alert MCAQD personnel, stakeholders, and customers of a pollution problem; and,
3. onsite response from department inspectors and stakeholders to identify and discourage pollution activity and to reduce the risk of pollution impacts.

The alerts requests that dust control permit holders inspect their sites as soon as possible and employ Best Available Control Measures to stabilize all disturbed soils to reduce blowing dust following the notification. The MCAQCED inspectors also review the data and current circumstances, make site visits, or take other appropriate actions to help stop PM concentrations from increasing. To better expedite response actions, meteorological data such as wind speed and direction are also available in five-minute increments.

There are little to no immediate actions that can be taken to reduce high concentrations of gaseous CPs. Currently, no RRNS triggers have been established for gaseous pollutants. In general, gaseous pollutant concentrations are decreased through planning and implementing long-term emission controls on sources. Depending on local sources of gaseous pollutants, it may be feasible to have a source stop operating at such times to reduce emissions. For instance, SO₂ is prone to spiking during certain industrial activities, and at such a time, temporarily shutting down an operation may be a viable control measure. Although a short-term increase or spike may occur for a particular gas, we rarely see them unless they are associated with out-of-the-ordinary activities near the site.

Emergency Response

The MCAQD is equipped to respond to certain air quality emergencies throughout Maricopa County upon request. In responding to emergencies, MCAQD has a wide variety of specialized equipment to assess air quality and meteorological conditions. These include several specially equipped trailers and a large self-powered van equipped with CP monitors and meteorological instruments. In addition, AMD has purchased several portable monitors, including a FTIR to monitor air toxics and an Area-Rae system to monitor chlorine and ammonia.

Winter Burning Study

For the 2016 - 2017 winter season, additional PM_{2.5} and PM_{2.5} speciation monitors were deployed with the following questions in mind:

- What are the contributing factors, e.g., sources, of the high PM_{2.5} values at the Durango, South Phoenix, and West Phoenix sites?
- What is the geographical extent of the high PM_{2.5} values?
- How much does fireplace burning contribute to PM_{2.5} levels?

Study information and conclusions will be available in late 2017.

Information Regarding Additional Air Monitoring within Maricopa County

The ADEQ operates its own air monitoring surveillance system within the State of Arizona, which includes the JLG Supersite in central Phoenix. The JLG Supersite is part of the national air monitoring surveillance system and numerous SLAMS monitors operate there. In addition, ADEQ collects research data for other air monitoring programs at both the JLG Supersite and MCAQD's South Phoenix site. The research data support EPA's several air monitoring programs that include, but are not limited to: identifying airborne air toxics and ozone precursors, identifying the chemical composition of PM_{2.5}, and measuring visual haze.

Specifically, ADEQ performs air monitoring in Maricopa County for the Chemical Speciation Network (CSN), the Interagency Monitoring of Protected Visual Environments (IMPROVE), the National Air Toxics Trends Stations (NATTS), the National Core multi-pollutant monitoring stations (NCORE), the Photochemical Assessment Monitoring Stations (PAMS), and the Urban Air Toxics Monitoring Program (UATMP). They also operate visibility cameras and meteorological monitors within the County. Occasionally, ADEQ may temporarily use other sites for special projects.

For more information about ADEQ's network, consult the [ADEQ Air Quality Division's website](#).

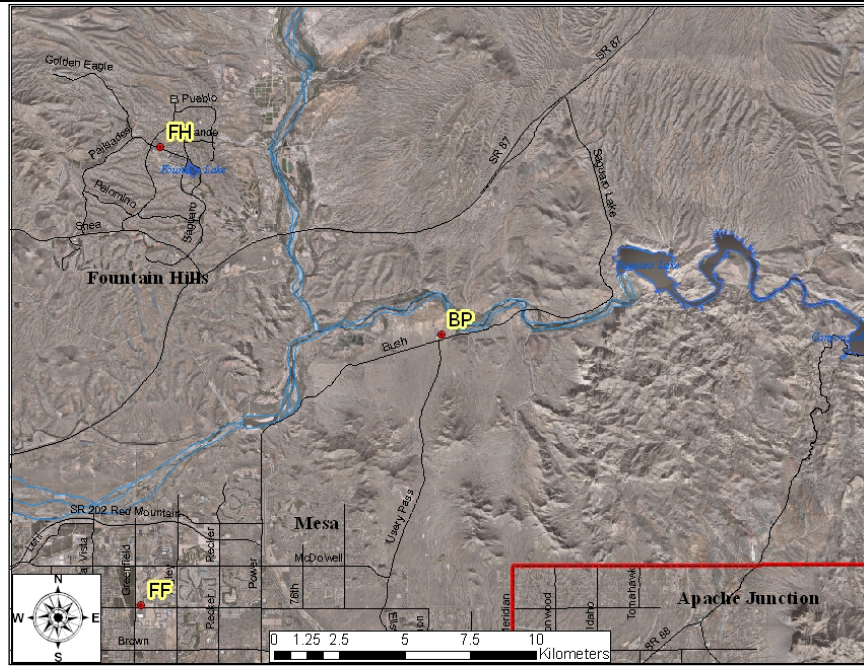
REFERENCES

1. The [eCFR Title 40, Parts 50, 53, and 58](#)
2. EPA Criteria Pollutant Information: <https://www.epa.gov/criteria-air-pollutants>
3. EPA NAAQS Information: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>
4. EPA AirNow webpage: <http://airnow.gov/>
5. EPA AQS AirData website: <http://www.epa.gov/airdata>
6. EPA OAQPS QA Webpage: <https://www3.epa.gov/ttn/amtic/qalist.html>
7. EPA Exceptional Events webpage: <https://www.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events>
8. EPA Region 9 Air Program Information: <http://www.epa.gov/region9/air/index.html>
9. Arizona SIP Information: <http://www.azdeq.gov/environ/air/plan/index.html>
10. ADEQ Natural and Exceptional Events Information:
<https://www.azdeq.gov/environ/air/plan/nee.html>
11. MCAQD Online Interactive Air Quality Map: <http://alert.fcd.maricopa.gov/alert/Google/v3/air.html>
12. MCAQD Prior Annual Monitoring Plans and Network Assessments:
<http://www.maricopa.gov/1669/Air-Monitoring-Network-Plans-Assessments>
13. MCAQD Dusts Sources, Control and Training:
<https://www.maricopa.gov/1913/Dust-Sources-Control-and-Training>

APPENDIX I – 2016 AIR MONITORING DATA BY SITE

**Site information includes photographs, site type and spatial scale,
and population represented.**

Blue Point (BP) (04-013-9702)



Site Location: Bush Hwy. & Uwey Pass Rd., Maricopa County
Spatial Scale: Urban
Site Type: Max. O₃ Conc.



Site Description: The Blue Point site began operating in July 1995. It is located in a Maricopa County Sheriff's Sub-Station in Tonto National Forest. This site represents the maximum O₃ concentration and urban-scale downwind transport conditions. This site is located approximately 40 miles east of the Phoenix metropolitan area. This SLAMS location monitors for O₃. Meteorological monitors operating at this site include ambient temperature and wind speed/direction.

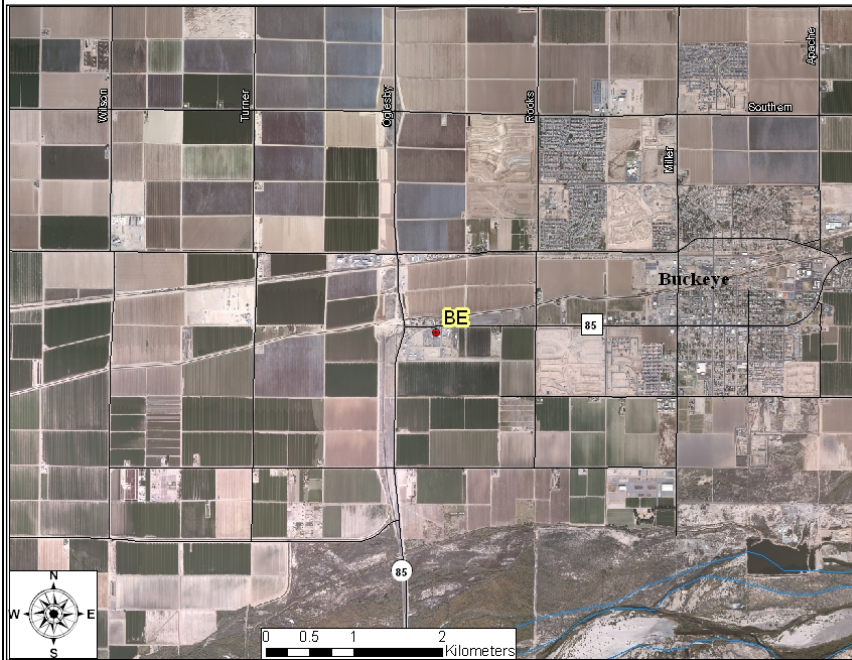
		2014	2015	2016
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.088*	0.077*	0.074*
	Number of O ₃ Daily Exceedances	2	2	4
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.075	0.074	0.072#

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

Buckeye (BE) (04-013-4011)



Site Location: AZ Hwy. 85 & MC Hwy. 85, Buckeye
Spatial Scale:
 Neighborhood for CO, O₃, and PM₁₀ and Urban for NO₂
Site Type: Population Exposure



Site Description: The Buckeye site was established on August 1, 2004. The site is located in the Maricopa County Department of Transportation - Southwest Facility. The immediate area is agriculture and encroaching residential development. This SLAMS location monitors for CO seasonally, NO₂, O₃, and PM₁₀. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

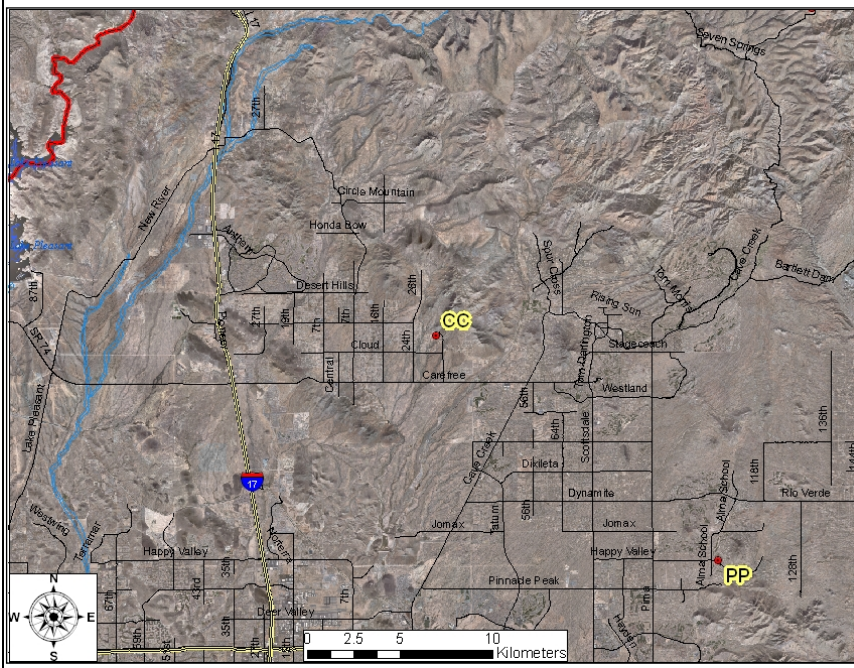
		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	0.6	0.5	0.6
	Number of 8-hr CO Exceedances	0	0	0
NO₂	Annual NO ₂ Avg. (ppb)	8.65	7.14	6.90
	NO ₂ 1-hr Avg. 98 th Percentile (ppb)	37.0	34.0	29.0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.068	0.064	0.064
	Number of O ₃ Daily Exceedances	0	0	0
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.062	0.060	0.059
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	271*‡	124	153
	Number of 24-hr PM ₁₀ Exceedances	2	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	43.4	34.4	40.2

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site – listed value is the highest official current AQS reading

Cave Creek (CC) (04-013-4008)



Site Location: 32nd St. & Carefree Hwy., Cave Creek
Spatial Scale: Urban
Site Type: Max. O₃ Conc.



Site Description: The Cave Creek site began operating in August 2001. It is located in the Maricopa County Cave Creek Recreation Area (Park Office). This site was chosen through discussions on modifying the O₃ network for the 2008 8-hr O₃ standard. This SLAMS location only monitors for O₃. Meteorological monitors operating at this site include ambient temperature, barometric pressure, rain, relative humidity, and wind speed/direction.

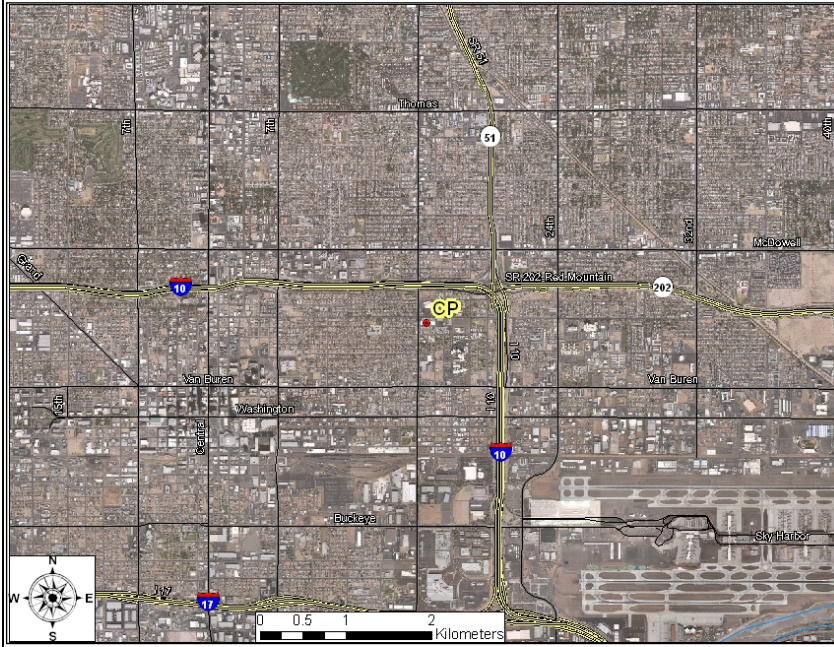
		2014	2015	2016
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.081*	0.072	0.073*
	Number of O ₃ Daily Exceedances	2	0	5
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.074	0.071	0.071#

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

Central Phoenix (CP) (04-013-3002)



Site Location: 19th St. & Roosevelt St., Phoenix
Spatial Scale: Neighborhood
Site Type:
 Population Exposure for CO, O₃, and PM₁₀
 Highest Concentration for NO₂ and SO₂



Site Description: The Central Phoenix site has been in existence for over five decades and has provided a long-term historical database with a high rate of data recovery. The site is representative of high population exposure (greater than 5000 people per square mile) in the central Phoenix area. This SLAMS location monitors for CO, PM₁₀, NO₂, O₃, and SO₂. Meteorological monitors operating at this site include ambient temperature, barometric pressure, and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	2.5	2.0	2.0
	Number of 8-hr CO Exceedances	0	0	0
NO₂	Annual NO ₂ Avg. (ppb)	19.44	17.85	17.34
	NO ₂ 1-hour Average 98 th Percentile (ppb)	60.0	59.0	59.0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.077*	0.075	0.072*
	Number of O ₃ Daily Exceedances	1	0	3
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.074	0.072	0.070
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	182*‡	114	106
	Number of 24-hr PM ₁₀ Exceedances	1	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	32.0	26.2	32.6
SO₂	SO ₂ 1-hour 99 th Percentile (ppb)	7.0	7.0	6.0
	Number of SO ₂ Exceedances	0	0	0
	Annual SO ₂ Avg. (ppb)	1.28	1.04	0.58

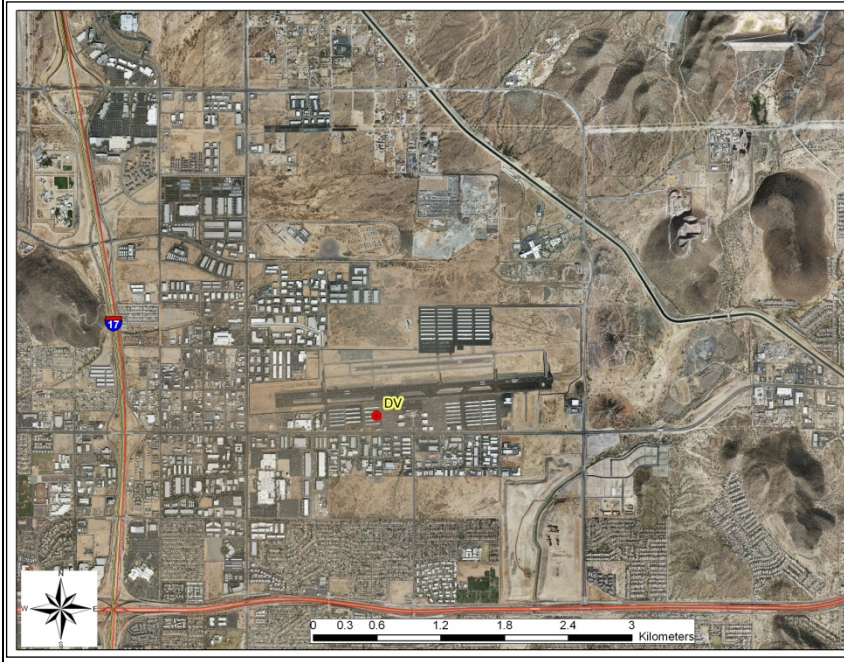
Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

‡ Indicates EEs at this site – listed values is the highest official current AQS reading

Deer Valley (DV) (04-013-4018)



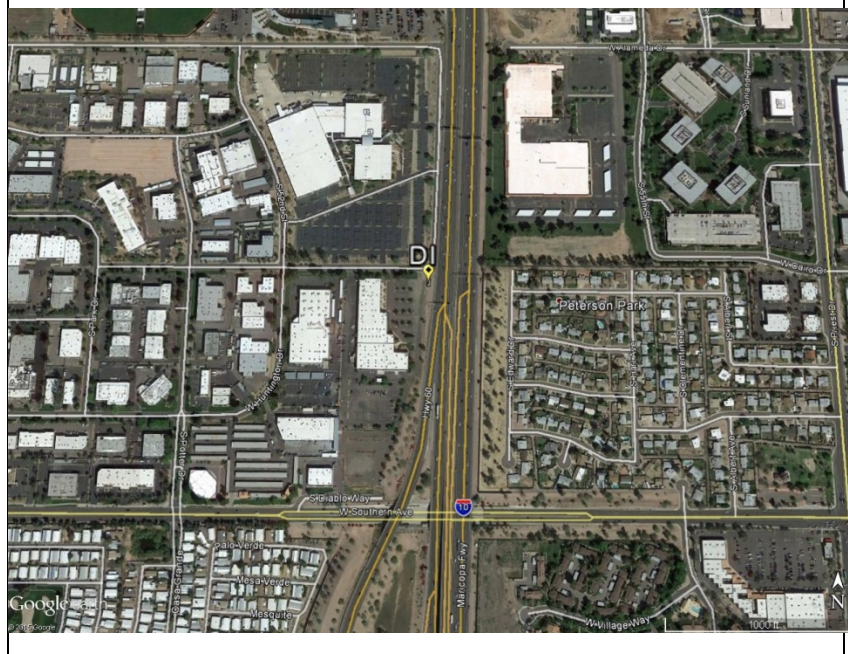
Site Location: 7th Ave. & Deer Valley Rd.
Spatial Scale: Middle
Site Type: Source-Oriented



Site Description: The Deer Valley site is located on the grounds of the Deer Valley Airport in north Phoenix. This site was started in July 2010, because changes in the Pb NAAQS necessitated that MCAQD begin Pb monitoring once again. All ambient Pb monitoring had been discontinued in 1997, because concentrations were consistently much lower than the NAAQS at that time. The source of Pb emissions is the general aviation fuels used in the propeller-driven aircraft, and Deer Valley Airport is one of the busiest general aviation airports in Maricopa County. This SLAMS location monitors for Pb only. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

		2014	2015	2016
Pb	Max. 24-hr Pb Avg. ($\mu\text{g}/\text{m}^3$)	0.087	0.104	0.073
	Number of Pb 24-hr Exceedances ($> 0.15 \mu\text{g}/\text{m}^3$)	0	0	0
	Pb Max.3-month Rolling Quarterly Average ($\mu\text{g}/\text{m}^3$)	0.05	0.05	0.05

Diablo (DI) (04-013-4019)



Site Location: Fairmont Dr. & Diablo Way
Spatial Scale: Micro
Site Type: Source-Oriented



Site Description: The Diablo site was the first near-road air monitoring site established by MCAQD on the west side of the I-10 highway just south of the Fairmont/Diablo Way intersection. There is a concrete barrier between the highway and the frontage road, offering safety, and we have erected a secure shelter for housing the monitoring instruments. In February 2014, we began reporting CO and NO₂ data, with PM_{2.5} data soon following in May 2014. This SLAMS location monitors for CO, NO₂, and PM_{2.5}. Meteorological monitors operating at this site include ambient temperature, relative humidity, and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	1.4	1.6	1.5
	Number of 8-hr CO Exceedances	0	0	0
NO₂	Annual NO ₂ Avg. (ppb)	20.83	21.41	21.47
	NO ₂ 1-hr Avg. 98 th Percentile (ppb)	59.0	53.0	54.0
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	29.2†	22.5	62.7
	Number of 24-hr PM _{2.5} Exceedances	0	0	0
	Annual PM _{2.5} Avg. (µg/m ³)	9.71†	7.86	7.89
	PM _{2.5} 98 th Percentile Value (µg/m ³)	21.4†	17.0	16.6

† < 75% data completeness due to May startup (238 daily observations in 2014)

Durango Complex (DC) (04-013-9812)



Site Location: 27th Ave & Durango St., Phoenix
Spatial Scale: Neighborhood
Site Type: Highest Concentration



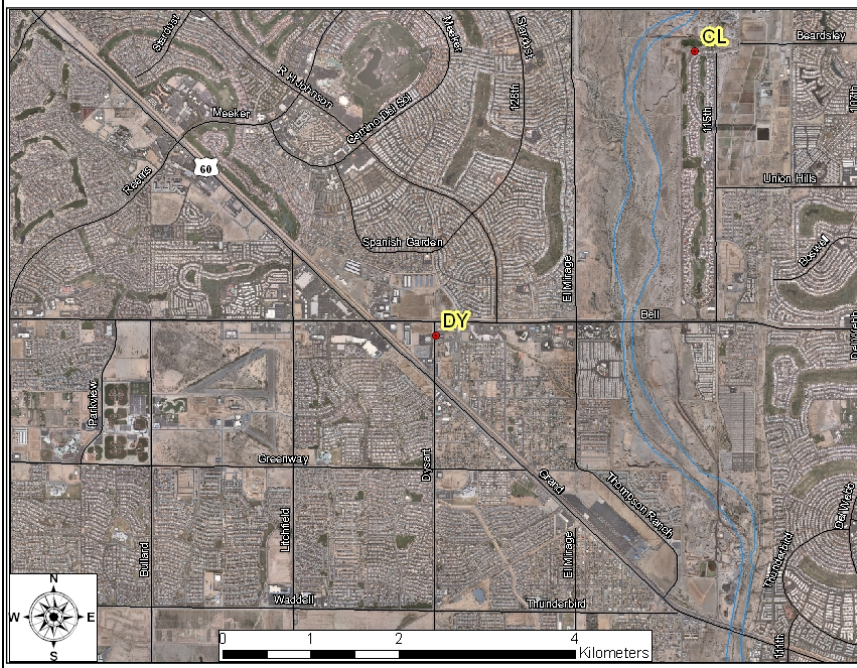
Site Description: This site is located in the Maricopa County Flood Control District storage yard. Monitoring began on January 6, 1999 with the intent to replace the old maximum highest concentration site. However, in 2000 the EPA determined that the site is not equivalent to that old site, which prompted the establishment of a new highest concentration site (West 43rd). This SLAMS location monitors for PM₁₀, PM_{2.5}, and SO₂. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

		2014	2015	2016
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	172*‡	100	112
	Number of 24-hr PM ₁₀ Exceedances	2	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	42.1	26.3	33.0
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	56.4*	32.4	64.2
	Number of PM _{2.5} 24-hr Exceedances	1	0	2
	Annual PM _{2.5} Avg. (µg/m ³)	10.12	8.97	9.48
	98 th Percentile PM _{2.5} Value (µg/m ³)	24.1	27.1	22.7
SO₂	SO ₂ 1-hour 99 th Percentile (ppb)	8.0	9.0	7.0
	Number of SO ₂ Exceedances	0	0	0
	Annual SO ₂ Avg. (ppb)	0.87	1.04	0.45

* Indicates an exceedance of the standard

‡ Indicates EEs at this site

Dysart (DY) (04-013-4010)



Site Location: Bell Rd. & Dysart Rd., Surprise
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: The Dysart site was established in July 2003. It is located at the Maricopa County Facility Maintenance Yard at the corner of Bell Rd. and Dysart Rd. The site is in a growing population area in the northwest valley. The land use around the site consists of subdivisions of single family homes, commercial, and industrial. The location is approximately one mile west of the Agua Fria riverbed. This SLAMS location monitors for CO seasonally, O₃, and PM₁₀. Meteorological monitors operating at this site include: ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

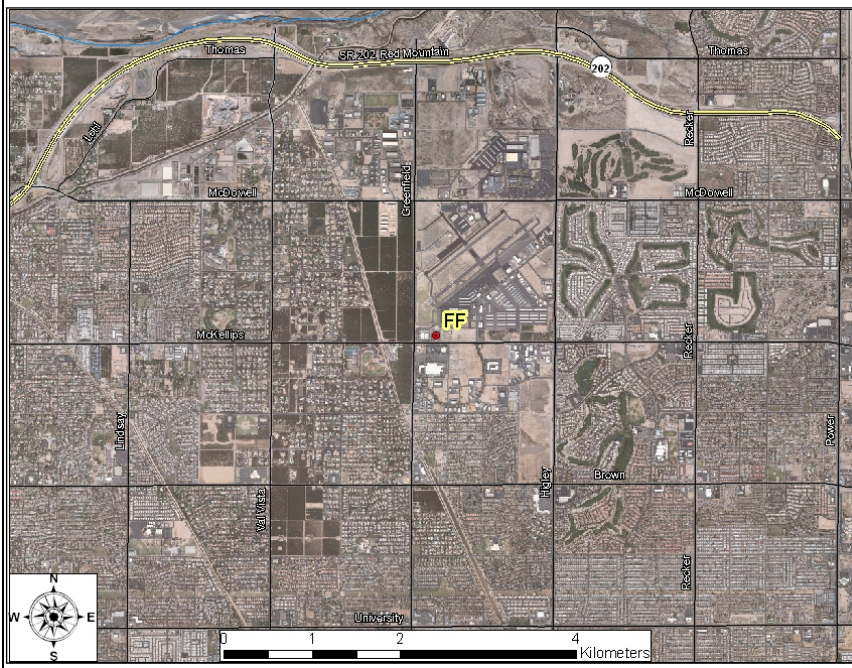
		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	0.6	0.7	0.5
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.075	0.069	0.069
	Number of Daily O ₃ Exceedances	0	0	0
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.072	0.070	0.066
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	163*‡	99	173*‡
	Number of 24-hr PM ₁₀ Exceedances	1	0	1
	Annual PM ₁₀ Avg. (µg/m ³)	26.7	22.4	28.2

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site

Falcon Field (FF) (04-013-1010)



Site Location: Greenfield & McKellips Rd., Mesa
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: Monitoring began in June of 1989. The site is located at a fire station near an airfield within a growing residential area. This SLAMS location monitors for O₃ only. Meteorological monitors operating at this site include ambient temperature, relative humidity, and wind speed/direction.

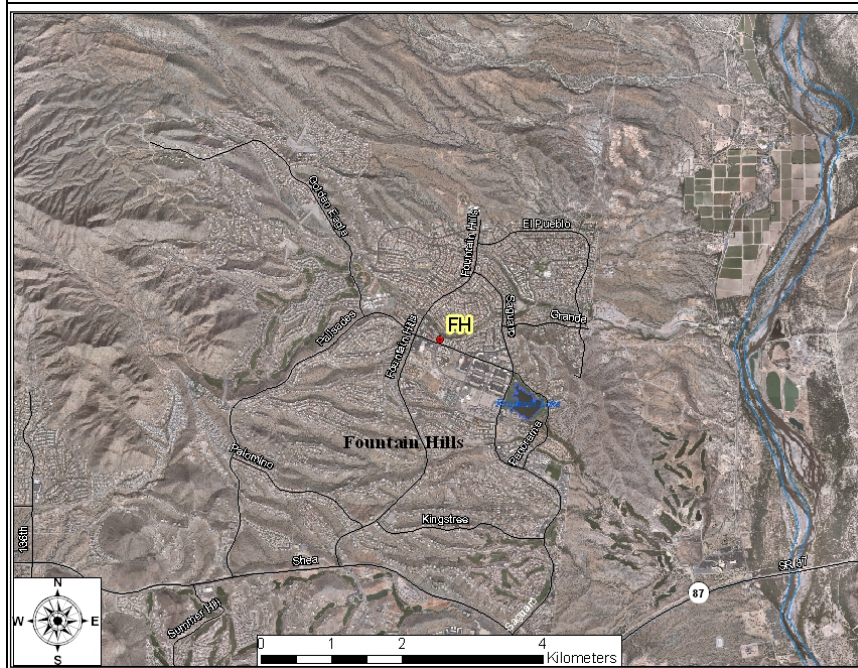
		2014	2015	2016
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.088*	0.084*	0.078*
	Number of O ₃ Daily Exceedances	4	3	5
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.074	0.075	0.073#

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

Fountain Hills (FH) (04-013-9704)



Site Location: Fountain Hills Blvd. & Palisades Blvd., Fountain Hills
Spatial Scale: Neighborhood
Site Type: Max. Ozone Conc.



Site Description: The site is located at a Fountain Hills fire station, and it became operational in April of 1996. The site is located approximately 15 miles downwind from the Phoenix metropolitan area and represents the high downwind O₃ concentrations on the fringes of the central basin district along the predominant summer/fall daytime wind direction. The site was shutdown from August 27, 2013 through May 14, 2014 for complex renovation. This SLAMS location monitors for O₃ only. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

		2014	2015	2016
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.075†	0.075	0.069
	Number of O ₃ Daily Exceedances	0	0	0
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.071†	0.069	0.068

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

† < 75% data completeness (223 valid daily observations in 2014)

Glendale (GL) (04-013-2001)



Site Location: 59th Ave. & Olive Ave., Glendale
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: The site is located on the grounds of Glendale Community College in a populous residential area. Homes, various strip malls, food establishments, and parks surround the site. This SLAMS location monitors for CO seasonally, O₃, PM₁₀, PM_{2.5}. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	1.4	1.6	1.7
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.079*	0.071	0.071*
	Number of O ₃ Daily Exceedances	2	0	1
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.074	0.070	0.068
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	205*‡	78	180*‡
	Number of 24-hr PM ₁₀ Exceedances	1	0	2
	Annual PM ₁₀ Avg. (µg/m ³)	27.4	18.3	22.1
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	50.0*	26.9	113.9*
	Number of 24-hr PM _{2.5} Exceedances	1	0	2
	Annual PM _{2.5} Avg. (µg/m ³)	7.73	6.96	6.75
	PM _{2.5} 98 th Percentile Value (µg/m ³)	18.6	18.9	17.7

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site

Greenwood (GR) (04-013-3010)



Site Location: 27th Ave. & I-10,
Phoenix
Spatial Scale: Middle
Site Type: Population
Exposure



Site Description: Monitoring began at this site in December 1993 and ended in June 2016. The station was bordered by I-10, homes, and the Greenwood Cemetery. Interstate-17 is approximately one mile to the east of where the site was located. This SLAMS location monitored for CO, NO₂, and PM₁₀. Meteorological monitors operated at this site included ambient temperature, barometric pressure, and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	2.6	2.4	2.2†
	Number of 8-hr CO Exceedances	0	0	0
NO₂	Annual NO ₂ Avg. (ppb)	24.55	21.91	22.07†
	NO ₂ 1-hour Average 98 th Percentile (ppb)	64.0	61.0	59.0†
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	208*‡	106	108†
	Number of 24-hr PM ₁₀ Exceedances	2	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	44.0	34.8	40.8†

Note: Air monitoring at the Greenwood site ended on June 19, 2016.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site - listed value is the highest official current AQS reading.

† < 75% data completeness (169 valid daily observations in 2016)

Higley (HI) (04-013-4006)



Site Location: Higley Rd. & Williams Field Rd., Gilbert
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: Originally, in 1994, ADEQ setup this site to monitor for background particulate concentrations near the urban limits of Maricopa County. Since then, urban expansion has enveloped the site, so it no longer serves its original intended purpose. The AMD has monitored for PM₁₀ since the second quarter of 2000. This is a neighborhood scale station with a monitoring type of high population exposure. The Roosevelt Water District asked us to remove the site from their property by end 2014, because they could no longer house the station. The station’s operation was temporarily discontinued on November 4, 2014 while a new location was identified.

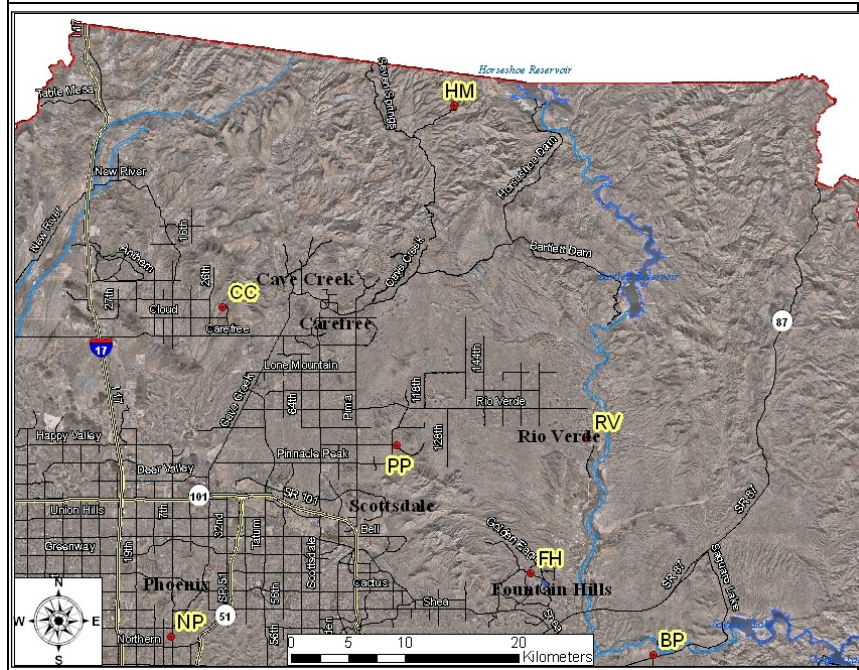
After receiving EPA approval for the new location, the AMD began build-out of the new site in 2016. The new site’s physical location is just NE of the old location, and the same AQS site identification number can be used. This SLAMS location will commence monitoring for PM₁₀ once the move is completed in early 2017. Meteorological monitors that will operate at this site include: ambient temperature, barometric pressure, delta T, and wind speed/direction.

		2014	2015	2016
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	179*‡	Not Operating	Not Operating
	Number exceedances 24-hr PM ₁₀	2		
	Annual PM ₁₀ Avg. (µg/m ³)	34.8		

*Indicates an exceedance of the standard

‡Indicates EEs at this site

Humboldt Mountain (HM) (04-013-9508)



Site Location: Humboldt Mountain Summit
 Spatial Scale: Regional
 Site Type: Max. O₃ Conc.



Site Description: This site became operational in August 1995. The Humboldt Mountain site is located on Federal Aviation Agency property, in a National Forest Service building within the Tonto National Forest. This site is located approximately 40 miles north-northeast of the Phoenix metropolitan area at an elevation of 5190 feet. This SLAMS location monitors for O₃ only. Meteorological monitors operating at this site include ambient temperature and relative humidity.

		2014	2015	2016
O ₃	Max. 8-hr O ₃ Avg. (ppm)	0.082*	0.076*	0.077*
	Number of O ₃ Daily Exceedances	3	1	7
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.075	0.073	0.073#

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

Mesa (ME) (04-013-1003)



Site Location: Broadway Rd. & Brooks Ave., Mesa
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: This site is located at the City of Mesa - Brooks Reservoir, which is located in an area that contains residential, commercial, and industrial properties. In December 2012, following a ten-month site construction by the City of Mesa, the site began operation again with new continuous PM₁₀, PM_{2.5}, and O₃ monitors. This SLAMS location monitors for CO seasonally, O₃, PM₁₀, and PM_{2.5}. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

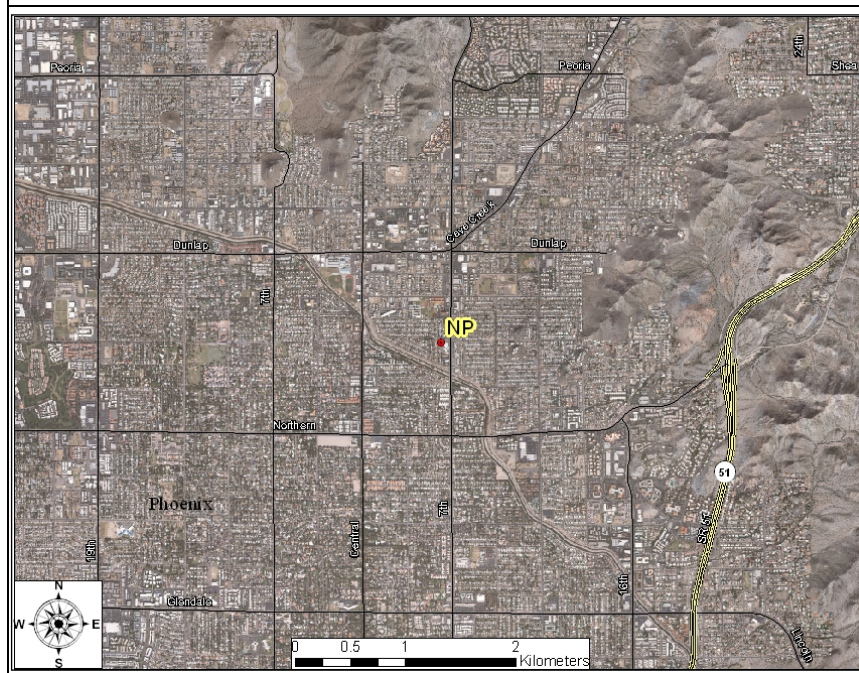
		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	4.2	1.5	1.5
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.086*	0.082*	0.079*
	Number of O ₃ Daily Exceedances	6	4	14
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	NA	0.078#	0.076#
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	155*‡	66	100
	Number of 24-hr PM ₁₀ Exceedances	1	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	30.4	17.2	21.1
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	33.9	23.2	83.0*
	Number of 24-hr PM _{2.5} Exceedances	0	0	1
	Annual PM _{2.5} Avg. (µg/m ³)	8.02	6.68	6.75
	PM _{2.5} 98 th Percentile Value (µg/m ³)	20.3	16.6	14.0

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

North Phoenix (NP) (04-013-1004)



Site Location: 7th St. & Butler Ave., Phoenix
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: This site is located in the Sunnyslope area of North Phoenix. The site is surrounded by residential and commercial properties. This SLAMS location monitors for CO seasonally, O₃, and PM₁₀, PM_{2.5}. Meteorological monitors operating at this site include ambient temperature, delta T (temperature inversion), barometric pressure, solar radiation, and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	1.4	1.4	1.2
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.082*	0.078*	0.078*
	Number of O ₃ Daily Exceedances	6	2	11
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.080#	0.077#	0.075#
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	199*‡	79	141
	Number of 24-hr PM ₁₀ Exceedances	1	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	27.9	18.5	20.7
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	33.9	21.4	52.2*
	Number of 24-hr PM _{2.5} Exceedances	0	0	1
	Annual PM _{2.5} Avg. (µg/m ³)	8.02	6.73	6.47
	PM _{2.5} 98 th Percentile Value (µg/m ³)	20.3	17.8	16.3

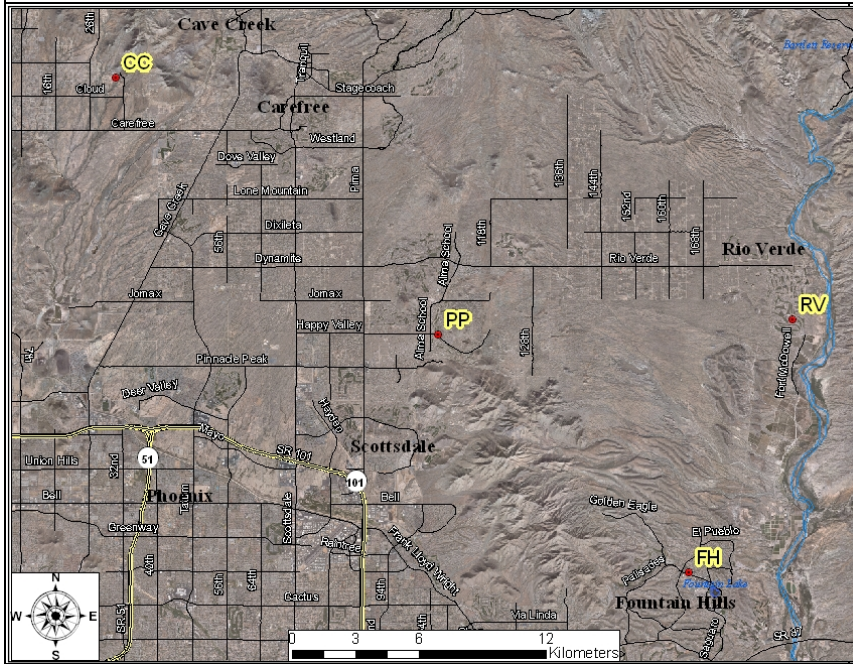
Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

‡ Indicates EEs at this site – listed value is the highest official current AQS reading

Pinnacle Peak (PP) (04-013-2005)



Site Location: Alma School & Happy Valley Rd., Scottsdale
Spatial Scale: Urban
Site Type: Max. O₃ Conc.



Site Description: The site is located in a geographic area of low-density population (less than 2500 people per square mile). In the current and previous years, O₃ exceedances have been recorded due to transport of O₃ and precursors from more urbanized areas of metropolitan Phoenix. This SLAMS location monitors for O₃ only. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

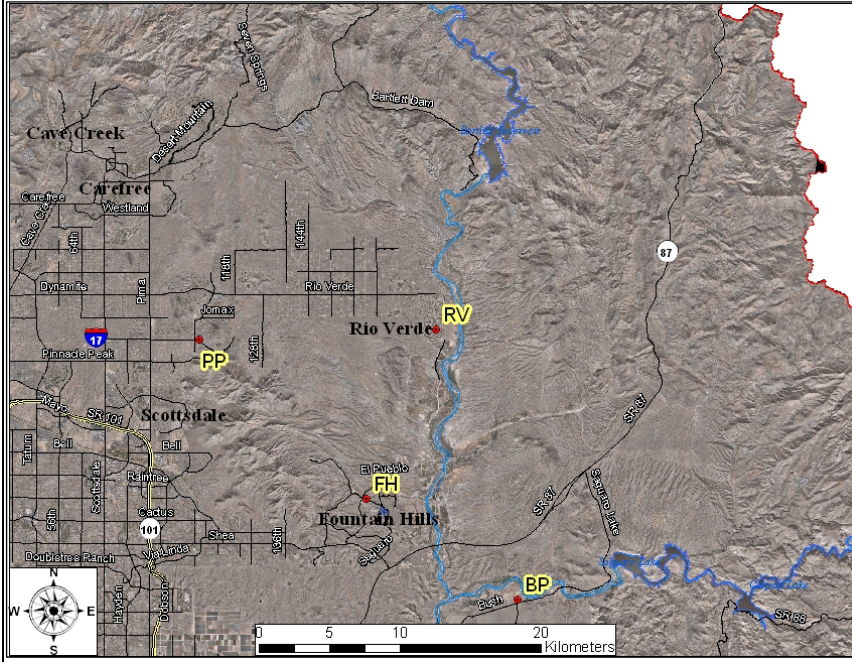
		2014	2015	2016
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.088*	0.083*	0.076*
	Number of O ₃ Daily Exceedances	6	4	11
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.078#	0.078#	0.077#

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

Rio Verde (RV) (04-013-9706)



Site Location: Forest Rd. & Del Ray Ave., Rio Verde
Spatial Scale: Urban
Site Type: Max. O₃ Conc.



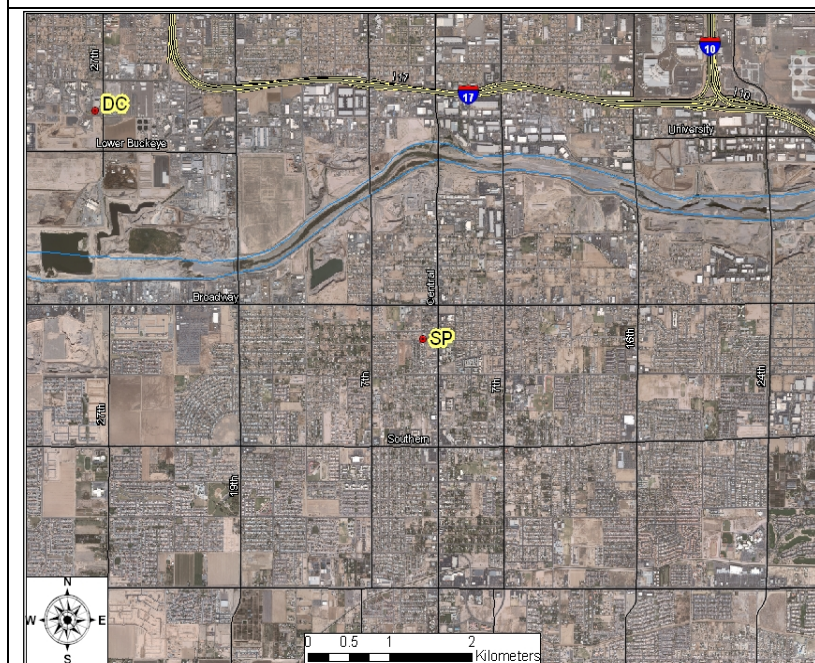
Site Description: This site has been in operation since the spring of 1997. The monitor is located at the fire station / County Sheriff's Office Sub-Station located in a residential area surrounded by the desert of Tonto National Forest. The site is on the edge of a Class I Wilderness Area. This SLAMS location monitors for O₃ only. No meteorological monitors operate at this site.

		2014	2015	2016
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.085*	0.070	0.075*
	Number of O ₃ Daily Exceedances	2	0	3
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.072	0.071	0.070

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

South Phoenix (SP) (04-013-4003)



Site Location: Central Ave. & Broadway Rd., Phoenix
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: The site has operated at its current location since October 1999. The site borders a mixture of high population density residential and commercial properties. This SLAMS location monitors for CO seasonally, O₃, PM₁₀, and PM_{2.5}. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

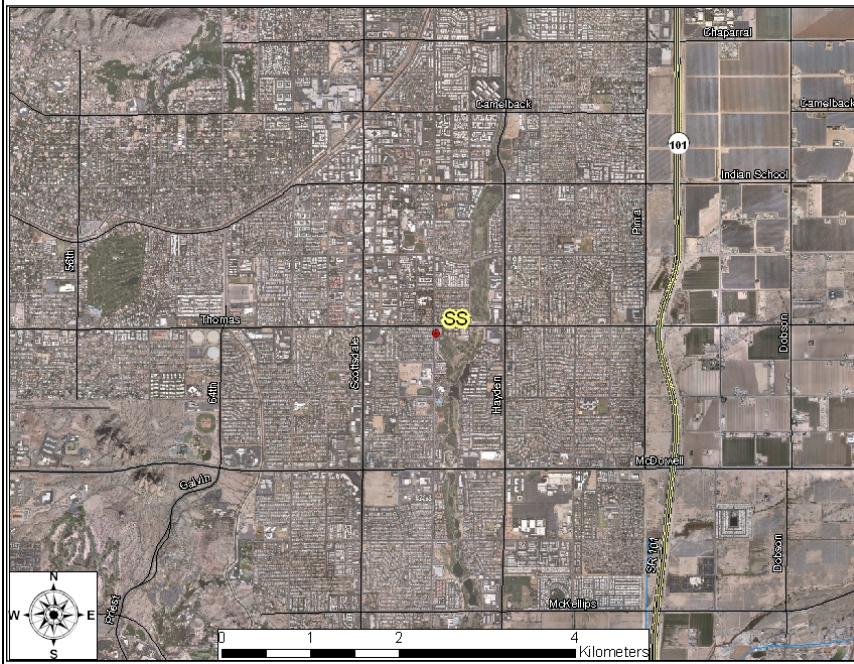
		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	2.0	2.1	2.3
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.080*	0.073	0.071*
	Number of O ₃ Daily Exceedances	2	0	1
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.075	0.072	0.070
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	170*‡	86	130
	Number of 24-hr PM ₁₀ Exceedances	3	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	40.6	25.5	31.1
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	101.7*	44.6	108.0*
	Number of 24-hr PM _{2.5} Exceedances	1	2	1
	Annual PM _{2.5} Avg. (µg/m ³)	10.27	8.99	8.45
	PM _{2.5} 98 th Percentile value (µg/m ³)	26.5	27.7	22.8

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site.

South Scottsdale (SS) (04-013-3003)



Site Location: Thomas Rd. & Miller Rd., Scottsdale
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: The South Scottsdale site is located at a City of Scottsdale fire station. The area surrounding the site is residential with a density of 2500 to 5000 persons per square mile. Previously, SO₂ was monitored here, but was discontinued in 2010 due to extremely low values being recorded. The SO₂ monitor was moved to the DC site, which is closer to SO₂ point sources. In addition, NO₂ was monitored here, but this was discontinued in 2011. The last year for reporting NO₂ data in the ANMP was 2014. This SLAMS location monitors for CO seasonally, O₃, and PM₁₀. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

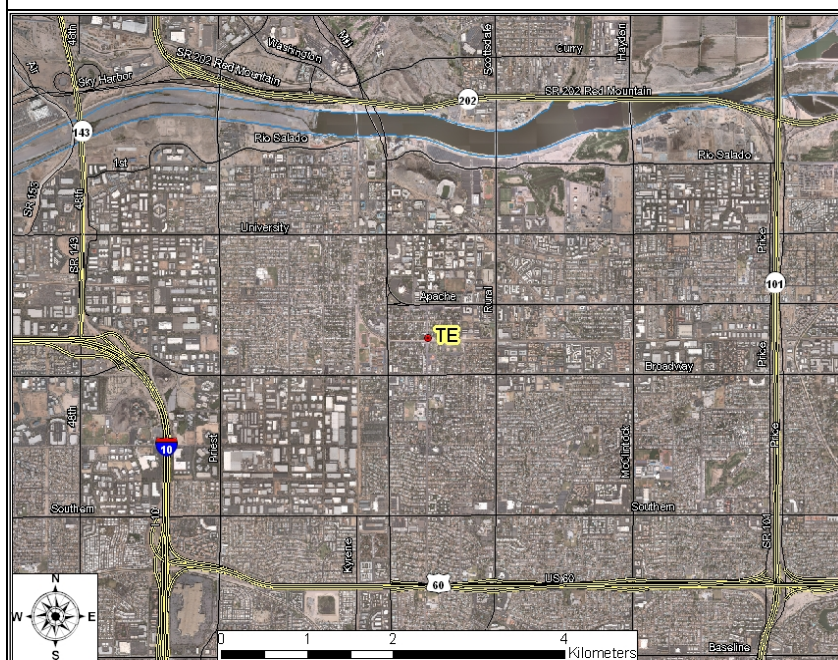
		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	1.4	1.4	1.8
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.078*	0.074	0.075*
	Number of O ₃ Daily Exceedances	1	0	3
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.075	0.071	0.070
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	193*‡	86	115
	Number of 24-hr PM ₁₀ Exceedances	2	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	31.0	24.1	28.2

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site

Tempe (TE) (04-013-4005)



Site Location: Apache Blvd. & College Ave., Tempe
Spatial Scale: Neighborhood
Site Type: Population Exposure



Site Description: The site began operating in 2000 and it is located near the ASU Tempe Campus. The site is surrounded by residential homes, some high-density residential properties, and a railroad track. In spring 2015, the site was temporarily shutdown due to the owner, Arizona Public Service – a power provider, needing to make infrastructure upgrades to the site. This SLAMS location monitors for CO seasonally, O₃, PM₁₀, and PM_{2.5}. Meteorological monitors operating at this site include ambient temperature, delta T (temperature inversion), rain, and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	1.4	1.4	2.0
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.077*	0.055	0.071*
	Number of O ₃ Daily Exceedances	1	0	1
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.071	0.064	0.063
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	175*‡	52	77
	Number of 24-hr PM ₁₀ Exceedances	1	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	28.7	18.4	21.8
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	44.0*	19.1	59.2*
	Number of 24-hr PM _{2.5} Exceedances	1	0	1
	Annual PM _{2.5} Avg. (µg/m ³)	8.63	8.88	6.84
	PM _{2.5} 98 th Percentile Value (µg/m ³)	17.4	16.9	14.9

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site

Thirty-Third (TT) (04-013-4020)



Site Location: Interstate-10 & 33rd Ave., Phoenix
Spatial Scale: Neighborhood
Site Type: Source-Oriented



Site Description: The Thirty-Third site was the second near-road air monitoring site established by MCAQD on the south side of the I-10 highway just east of 33rd Avenue. The site is oriented on an east-west highway and is located about three meters (midway) downslope from 33rd Avenue toward the I-10. It is assessable from the frontage road, offering safety, and we have erected a secure shelter for housing the monitoring instruments. In September 2015, we began reporting CO, NO₂, and PM_{2.5} data. The only SLAMS monitor is NO₂; the CO and PM_{2.5} were SPMs. The SPMs collected CO and PM_{2.5} data from September through March 2016 to support the wintertime speciation study. Meteorological monitors operating at this site include ambient temperature and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)		2.8†	2.6†
	Number of 8-hr CO Exceedances		0	0
NO₂	Annual NO ₂ Avg. (ppb)		31.86	30.89
	NO ₂ 1-hr 98 th Percentile Avg. (ppb)		64.0	63.0
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	Not Operating	35.3	119.1
	Number of 24-hr PM _{2.5} Exceedances		0	1
	Annual PM _{2.5} Avg. (µg/m ³)		10.48†	13.58†
	PM _{2.5} 98 th Percentile Value (µg/m ³)		34.0	30.0

† < 75% data completeness (~ 90 valid daily observations in 2016)

West Chandler (WC) (04-013-4004)



Site Location: Frye Rd. & Ellis St., Chandler
Spatial Scale: Neighborhood (CO and O₃), Middle (PM₁₀)
Site Type: Population Exposure



Site Description: This site was established in January 1995. A wide range of land uses surrounds the site including residential, agriculture, and heavy industry (semiconductor manufacturing plants and liquid air storage). This SLAMS location monitors for CO seasonally, O₃, and PM₁₀. Meteorological monitors operating at this site include ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	1.7	1.6	1.4
	Number of 8-hr CO Exceedances	0	0	0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.074	0.072	0.072*
	Number of O ₃ Daily Exceedances	0	0	3
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.071	0.070	0.069
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	163*‡	121	134
	Number of 24-hr PM ₁₀ Exceedances	1	0	0
	Annual PM ₁₀ Avg. (µg/m ³)	29.3	23.7	29.7

Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

‡ Indicates EEs at this site

West 43rd Avenue (WF) (04-013-4009)



Site Location: 43rd Ave. & Broadway Rd., Phoenix
Spatial Scale: Middle
Site Type: Highest Concentration



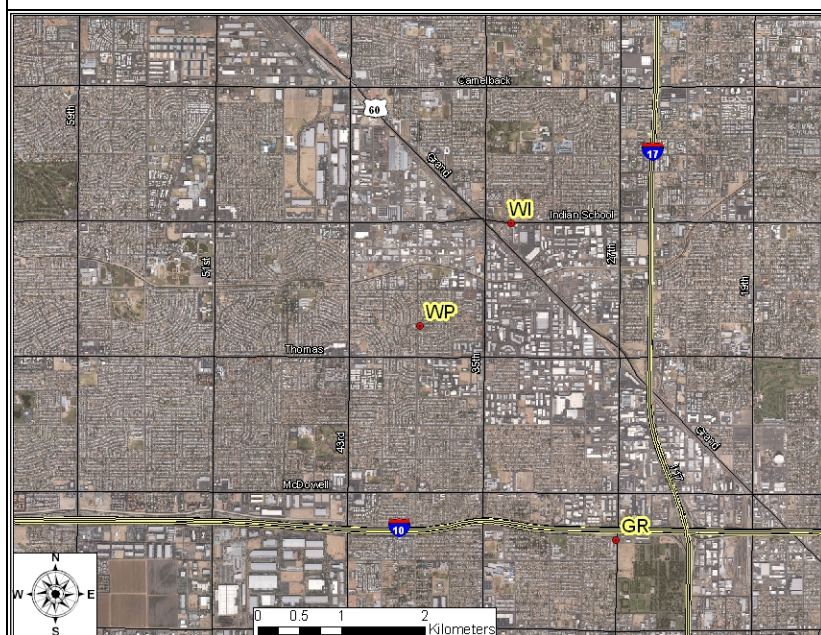
Site Description: Monitoring began at the site in the 2nd quarter of 2002. This site is located at a Maricopa County Department of Transportation storage lot and is surrounded by a combination of heavy industry and residential homes. The main purpose of the site is to measure maximum PM₁₀ concentration. The sources around the site include sand and gravel operations, automobile and metal recycling facilities, landfills, paved and unpaved haul roads, and cement casting. This SLAMS location monitors for PM₁₀. Meteorological monitors operating at this site include ambient temperature, barometric pressure, delta T (temperature inversion), and wind speed/direction.

		2014	2015	2016
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	171*‡	132	174*‡
	Number of 24-hr PM ₁₀ Exceedances	1	0	1
	Annual PM ₁₀ Avg. (µg/m ³)	45.9	36.5	46.9

*Indicates an exceedance of the standard

‡Indicates EEs at this site

West Phoenix (WP) (04-013-0019)



Site Location: 39th Ave. & Earll Dr., Phoenix
Spatial Scale: Neighborhood
Site Type: Population Exposure (CO, NO₂, O₃, PM₁₀), Highest Concentration (PM_{2.5})



Site Description: This site has been operational since 1984. The spatial scale for the West Phoenix site is Neighborhood. It is located in an area of stable, high-density residential properties. This SLAMS location monitors for CO, NO₂, O₃, PM₁₀, and PM_{2.5}. In addition, this is a QA collocation site for PM_{2.5} where the MCAQD operates one filter-based PM_{2.5} FRM sampler along with one continuous PM_{2.5} FEM analyzer as per 40 CFR Part 58 Appendix A. Meteorological monitors operating at this site include ambient temperature, barometric pressure, delta T (temperature inversion), and wind speed/direction.

		2014	2015	2016
CO	Max. 8-hr CO Avg. (ppm)	4.2	2.8	3.2
	Number exceedances 8-hr CO	0	0	0
NO₂	Annual NO ₂ Avg. (ppb)	17.97	16.39	16.24
	NO ₂ 1-hr Avg. 98 th Percentile (ppb)	57.0	55.0	54.0
O₃	Max. 8-hr O ₃ Avg. (ppm)	0.079*	0.076*	0.073*
	Number of O ₃ Daily Exceedances	4	2	6
	3-year 8-hr Avg. O ₃ of 4 th Highest Value (ppm)	0.078#	0.075	0.073#
PM₁₀	Max. 24-hr PM ₁₀ Avg. (µg/m ³)	210*‡	72	172*‡
	Number of 24-hr PM ₁₀ Exceedances	2	0	1
	Annual PM ₁₀ Avg. (µg/m ³)	38.8	23.2	28.9
PM_{2.5}	Max. 24-hr PM _{2.5} Avg. (µg/m ³)	170.7*	40.5	152.1*
	Number of 24-hr PM _{2.5} Exceedances	3	2	1
	Annual PM _{2.5} Avg. (µg/m ³)	11.13	8.6	8.78
	PM _{2.5} 98 th Percentile Value	28.9	27.5	23.8

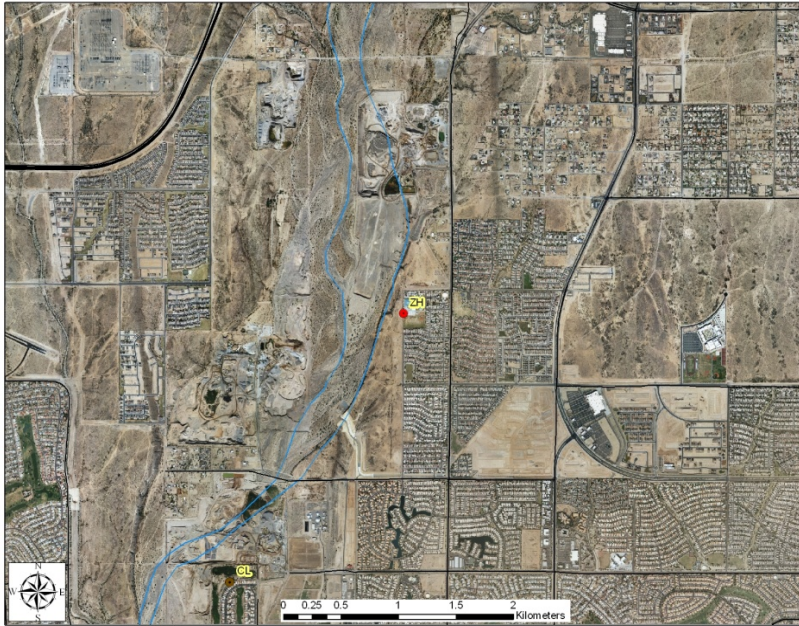
Note: The 2016 O₃ data represent the new O₃ NAAQS of 0.070 ppm; the 2014 and 2015 data represent the old O₃ NAAQS of 0.075 ppm.

* Indicates an exceedance of the standard

Indicates a violation of the standard

‡ Indicates EEs at this site - listed value is the highest official current AQS reading

Zuni Hills (ZH) (04-013-4016)



Site Location: 109th Ave. &
Deer Valley Rd., Phoenix
Spatial Scale: Neighborhood
Site Type: Population
Exposure



Site Description: This site opened in December 2009 and is located on the campus of the Zuni Hills Elementary School, which is approximately 1.7 miles to the northeast from the now closed Coyote Lakes monitor. Coyote Lakes was a source-oriented, middle-scale PM₁₀ site that was situated in the Agua Fria River bottom adjacent to sand and gravel mines. Zuni Hills replaced this with a population-oriented, neighborhood-scale site that is situated on the higher-elevation riverbank. This site will theoretically be able to represent the air quality for a larger area and a greater number of people. The site was temporarily shutdown for construction occurring in the area June 2014 - August 2014. This SLAMS location monitors for PM₁₀, only. Meteorological monitors operating at this site include ambient temperature and wind speed/direction.

		2014	2015	2016
PM₁₀	Max. 24-hr PM ₁₀ Avg.($\mu\text{g}/\text{m}^3$)	166*‡	81	174*‡
	Number of 24-hr PM ₁₀ Exceedances	1	0	1
	Annual PM ₁₀ Avg.($\mu\text{g}/\text{m}^3$)	24.0	21.5	26.5

*Indicates an exceedance of the standard

‡Indicates EEs at this site - listed value is the highest official current AQS reading.

APPENDIX II - EPA-REQUIRED SITE METADATA

Detailed information includes compliance information regarding air monitoring technical specifications found in *40 CFR §58.10 and Appendices A, C, D, and E* (QA, monitoring methods, network design, and monitor siting)

Required General Statement Regarding Changes to the PM_{2.5} Network

In the event the department needed to move or change a violating PM_{2.5} monitor, this procedure would be followed. The department would hold a public hearing regarding the requested change. Details and documentation of the requested change, as well as all public comments, would then be forwarded to the EPA R9 for approval. Any action on the department's part will be dependent on EPA R9 approval.

Please note that the previous statement is general in nature and required in this annual network review by *40 CFR Part 58*. The department does not currently have any violating PM_{2.5} monitors, nor does it have any proposals to move any PM_{2.5} monitors.

Site Schematic Descriptions

Analysis Method (filter samples only) refers to the laboratory method used to process and analyze PM and Pb filter samples.

Distance from Supporting Structure refers to a sample cane that is attached to a supporting structure, such as the side of a building. Currently within the county's network, the sample canes are located above shelter rooves and are not attached to supporting structures. Entries on site metadata tables show as "Not Relevant".

Distance from Obstructions on Roof refers to obstructions such as a parapet or a firewall. The distance to a nearby obstruction that is higher than the sample inlet, or probe, is listed or shown as > 20 meters.

Distance from Obstructions Not on Roof refers to obstructions such as trees that are higher than the probe. The distance to a nearby obstruction that is higher than the sample inlet, or probe, is listed or shown as > 20 meters.

Precision and Bias Audits

Dates of Annual Performance Evaluation refers to the QA audits on the gaseous analyzers. Twenty-five percent of the monitors operating within each gaseous pollutant's network are evaluated quarterly; thereby, each monitor is evaluated once per year as per *40 CFR Part 58, Appendix A, §3.2.2*.

Dates of Semi-Annual Flow Rate Audit refers to the QA audits on PM monitors as per *40 CFR Part 58, Appendix A, §§ 3.2.4 and 3.3.4*, and the Pb monitors as per *40 CFR Part 58, Appendix A, §3.4*, respectively. The AMD's QA team performs these evaluations once every six months.

Probe Sample Line Material refers to the chemical composition of the sample line material.

Pollutant Sample Residence Time refers to the amount of time that it takes a sample of air to travel between the probe inlet and the bulkhead of the analyzer. This residence time is calculated by a formula that is based on the sample line's diameter and length, and the flow rate of the air intake. It is important to keep residence time low to prevent gases in the air sample from reacting with the sample line material or with other gases in the sample; i.e., O₃ could react with nitrogen oxides in the sample if the residence time exceeds 20 seconds. This measurement applies to CO, NO₂, O₃, and SO₂ sample lines.

BLUE POINT

County ID: BP

AQS ID: 04-013-9702

Address: Bush Highway & Usery Pass Rd., Maricopa County

Coordinates: 33.54549N, -111.60925W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	O₃
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	26
Number of Accuracy Audits Performed Annually	4
Dates of Accuracy Audits on the Gaseous Analyzer	03/09/16 05/18/16 10/19/16 11/16/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Bi-Weekly
Frequency of Flow Rate Verification	Not Applicable
Appendix C Requirements - Monitoring Methodology	
Date Established	01/01/1993
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – Model 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Urban
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	8.9 meters

Airflow Arc	360°
Probe Sample Line Material	Teflon™
Pollutant Sample Residence Time	7.6 seconds
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstructions
Distance from Obstructions Not on Roof	11 meters
Distance from Closest Tree Dripline	11 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	Bush Highway
Distance and Direction to Road	160 meters, S
Traffic Count (ADT)	1,000
Groundcover	Paved

BUCKEYE

County ID: BE

AQS ID: 04-013-4011

Address 26453 W MC85

Coordinates: 33.37005N, -111.62070W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information				
Pollutant	CO	NO₂	O₃	PM₁₀
Parameter Code	42101	42602	44201	81102
Parameter Occurrence Code	1	1	1	1
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs				
Number of Precision Checks Performed Annually	16	26	26	24
Number of Accuracy Audits Performed Annually	4	5	3	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	03/15/16 09/13/16 09/27/16 10/12/16	01/05/16 05/10/16 06/21/16 11/08/16 12/06/16	05/10/16 06/21/16 12/06/16	01/05/16 02/02/16 04/12/16 07/19/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements – Monitoring Methodology				
Date Established	08/01/2004	08/01/2004	08/01/2004	08/01/2004
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – Model 300T	Teledyne API – Model 200T	Teledyne API – Model 400T	Thermo – TEOM 1405-S
Method Code	093	099	087	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Not Applicable	Low Volume

PM Monitor Collection Type	Not Applicable	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Urban	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	4 meters	4 meters	4 meters	4.5 meters
Probe Sample Line Material	Teflon™	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	7.12 seconds	7.12 seconds	7.12 seconds	Not Applicable
Airflow Arc	360°	360°	360°	360°
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	>20 meters	>20 meters	>20 meters	>20 meters
Distance from Closest Tree Dripline	>20 meters	>20 meters	>20 meters	>20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	U.S. Hwy 85	U.S. Hwy 85	U.S. Hwy 85	U.S. Hwy 85
Distance and Direction to Road	31 meters, N	31 meters, N	31 meters, N	31 meters, N
Traffic Count (ADT)	3,000	3,000	3,000	3,000
Groundcover	Paved	Paved	Paved	Paved

CAVE CREEK

County ID: CC

AQS ID: 04-013-4008

Address: 37019 N Lava Lane, Phoenix

Coordinates: 33.82169N, -112.01739W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	O₃
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	26
Number of Accuracy Audits Performed Annually	3
Dates of Accuracy Audits on the Gaseous Analyzer	04/07/16 06/16/16 10/06/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Bi-weekly
Frequency of Flow Rate Verification	Not Applicable
Appendix C Requirements - Monitoring Methodology	
Date Established	07/20/2001
Monitor Type	SLAMS
Monitor Make - Model	Teledyne - API Model 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Urban
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	4.8 meters
Airflow Arc	360°

Probe Sample Line Material	Teflon™
Pollutant Sample Residence Time	11.4 seconds
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters
Distance from Closest Tree Dripline	> 20 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	32 nd Street
Distance and Direction to Road	240 meters, NE
Traffic Count (ADT)	1,000
Groundcover	Paved

CENTRAL PHOENIX

County ID: CP

AQS ID: 04-013-3002

Address: 1645 E Roosevelt, Phoenix

Coordinates: 33.45793N, -112.04601W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information					
Pollutant	CO	NO₂	O₃	SO₂	PM₁₀
Parameter Code	42101	42602	44201	42401	81102
Parameter Occurrence Code	1	6	1	4	4
Collection Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs					
Number of Precision Checks Performed Annually	29	27	28	29	26
Number of Accuracy Audits Performed Annually	3	4	4	4	2
Dates of Accuracy Audits	04/19/16 05/06/16 12/01/16	06/02/16 08/25/16 10/06/16	04/19/16 06/14/16 09/08/16	01/20/16 02/17/16 07/14/16	04/05/16 07/14/16

on Gaseous & PM Analyzers		10/18/16	12/01/16	09/20/16	
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements - Monitoring Methodology					
Date Established	10/01/1966	01/01/1967	06/01/1967	01/01/1965	04/01/1985
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API - Model 300T	Teledyne API - Model 200T	Teledyne API - Model 400T	Teledyne API - Model 100T	Thermo - TEOM 1405-S
Method Code	093	099	087	100	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria					
Site Type	Population Exposure	Highest Concentration	Population Exposure	Highest Concentration	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood

Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria					
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	10.3 meters	10.3 meters	10.3 meters	10.3 meters	10.3 meters
Airflow Arc	360°	360°	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	7.5 seconds	7.5 seconds	7.5 seconds	7.5 seconds	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway A	16 th Street	16 th Street	16 th Street	16 th Street	16 th Street
Distance and Direction to Road	88 meters, W	88 meters, W	88 meters, W	88 meters, W	91 meters, W
Traffic Count (ADT)	24,000	24,000	24,000	24,000	24,000
Nearest Major Roadway B	Roosevelt St.	Roosevelt St.	Roosevelt St.	Roosevelt St.	Roosevelt St.

Distance and Direction to Road	75 meters, N	75 meters, N	75 meters, N	75 meters, N	75 meters, N
Traffic Count (ADT)	21,637	21,637	21,637	21,637	21,637
Groundcover	Paved	Paved	Paved	Paved	Paved

DEER VALLEY
 County ID: DV
 AQS ID: 04-013-4018
 Address: 1030 West Deer Valley Road, Phoenix
 Coordinates: 33.684627N, -112.08635W
 Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information		
Pollutant	Pb Primary	Pb Secondary
<i>Note: This is a collocated site for Pb.</i>		
Parameter Code	14129	14129
Parameter Occurrence Code	1	2
Collection Frequency	1 in 6 days	1 in 12 days
Analysis Method (sample filters only)	EQL-0510-191	EQL-0510-191
Analytical Laboratory	Pima County Regional Wastewater Reclamation Department (RWRD) Compliance and Regulatory Affairs Office (CRAO) Laboratory	
Any Proposal to Remove or Move Monitor?	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs		
Number of Precision Checks Performed Annually	8	8
Number of Accuracy Audits Performed Annually	2	2
Number of Collocation Assessments Performed	29	
Date of Accuracy Audits on Samplers	01/19/16 10/11/16	01/19/16 10/11/16
<i>Note: The audits did not meet EPA requirement of being 6 months apart. The audit SOP has been updated for this requirement.</i>		
All Precision/Bias Reports Submitted to AQS?	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17
Frequency of One-Point QC Check	Not Applicable	Not Applicable
Frequency of Flow Rate Verification	Quarterly	Quarterly

Appendix C Requirements - Monitoring Methodology		
Date Established	07/21/2010	07/21/2010
Monitor Type	SLAMS	SLAMS
Monitor Make - Model	Thermo TSP Sampler	Thermo TSP Sampler
Method Code	802	802
Pb Monitor Flow Type	High Volume	High Volume
Pb Monitor Collection Type	Total Suspended Particulates	Total Suspended Particulates
Method Type (FRM, FEM, ARM)	FRM	FRM
Appendix D Requirements - Network Design Criteria		
Site Type	Source-Oriented	Source-Oriented
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Middle Scale	Middle Scale
Monitoring Season	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers	2.7 meters	2.7 meters
Probe Inlet Height	4.1 meters	4.1 meters
Airflow Arc	360°	360°
Probe Sample Line Material	Not Applicable	Not Applicable
Pollutant Sample Residence Time	Not Applicable	Not Applicable
Filter Sample Material	Glass	Glass
Distance from Supporting Structure	Not Relevant	Not Relevant
Distance from Obstructions On Roof	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	Deer Valley Rd.	Deer Valley Rd.
Distance and Direction to Road	300 meters, S	300 meters, S
Traffic Count (ADT)	6,452	6,452
Groundcover	Paved	Paved

DIABLO

County ID: DI

AQS ID: 04-013-4019

Address: 1919 W. Fairmount Dr., Tempe

Coordinates: 33.39625N, -111.96797W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information			
Pollutant	CO	NO₂	PM_{2.5}
Parameter Code	42101	42602	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs			
Number of Precision Checks Performed Annually	26	26	25
Number of Accuracy Audits Performed Annually	5	5	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	03/22/16 04/06/16 04/19/16 11/02/16 12/14/16	02/09/16 03/22/16 08/24/16 09/07/16 12/20/16	02/09/16 04/06/16 04/19/16 11/02/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements - Monitoring Methodology			
Date Established	2/13/2014	02/13/2014	05/01/2014
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 200T	Thermo - TEOM 1405-DF
Method Code	093	099	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM

Appendix D Requirements - Network Design Criteria			
Site Type	Source-Oriented	Source-Oriented	Source-Oriented
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Micro	Micro	Micro
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	5 meters	5 meters	5 meters
Airflow Arc	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	7.14 seconds	7.14 seconds	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway A	Interstate-10	Interstate-10	Interstate-10
Distance and Direction to Road	30 meters, E	30 meters, E	30 meters, E
Traffic Count (ADT)	275,000	275,000	275,000
Nearest Major Roadway B	Fairmount Dr.	Fairmount Dr.	Fairmount Dr.
Distance and Direction to Road	18 meters, N	18 meters, N	18 meters, N
Traffic Count (ADT)	3,000	3,000	3,000
Groundcover	Paved/Gravel	Paved/Gravel	Paved/Gravel

DURANGO COMPLEX

County ID: DC

AQS ID: 04-013-9812

Address: 2702 RC Esterbrooks Blvd., Phoenix

Coordinates: 33.42650N, -112.11814W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information - NAAQS Air Monitoring			
Pollutant	PM₁₀	PM_{2.5}	SO₂
Parameter Code	81102	88101	42401
Parameter Occurrence Code	1	3	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Yes	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs			
Number of Precision Checks Performed Annually	24	25	27
Number of Accuracy Audits Performed Annually	3	3	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	01/14/16 04/06/16 07/13/16	01/14/16 04/06/16 07/13/16	05/04/16 06/15/16 11/03/16 12/14/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Not Applicable	Not Applicable	Bi-Weekly
Frequency of Flow Rate Verification	Bi-Weekly	Bi-Weekly	Not Applicable
Appendix C Requirements - Monitoring Methodology			
Date Established	07/01/1999	07/01/2005	01/01/2011
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF	Teledyne API – 100T
<i>Note: The same monitor measures PM₁₀ and PM_{2.5}.</i>			
Method Code	208	182	100
PM Monitor Flow Type	Low Volume	Low Volume	Not Applicable
PM Monitor Collection Type	Dichotomous	Dichotomous	Not Applicable

Method Type (FRM, FEM, ARM)	FEM	FEM	FRM
Appendix D Requirements - Network Design Criteria			
Site Type	Population Exposure	Highest Concentration	Highest Concentration
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Middle
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Distance between PM monitor inlets?	0 meters	0 meters	Not Applicable
<i>Note: The TEOM 1405-DF collects air for both PM₁₀ and PM_{2.5} measurements through the same inlet.</i>			
Probe Inlet Height	3.8 meters	3.8 meters	3.9 meters
Airflow Arc	360°	360°	360°
Probe Sample Line Material	Not Applicable	Not Applicable	Teflon™
Pollutant Sample Residence Time	Not Applicable	Not Applicable	6.61 sec
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	27 th Ave	27 th Ave	27 th Ave
Distance and Direction to Road	78 meters, E	76 meters, E	76 meters, E
Traffic Count (ADT)	16,000	16,000	16,000
Groundcover	Paved	Paved	Paved

DYSART

County ID: DY

AQS ID: 04-013-4010

Address: 16825 N Dysart Rd., Surprise

Coordinates: 33.63713N, -112.34184W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information			
Pollutant	CO	O₃	PM₁₀
Parameter Code	42101	44201	81102
Parameter Occurrence Code	1	1	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	No	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs			
Number of Precision Checks Performed Annually	6	26	24
Number of Accuracy Audits Performed Annually	0	3	3
Dates of Accuracy Audits on Gaseous & PM Analyzers	No Dates (Analyzer removed before scheduled audits were required.)	03/17/16 04/14/16 12/22/16	01/07/16 04/14/16 07/20/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements - Monitoring Methodology			
Date Established	09/01/2003	7/21/2003	07/14/2003
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-S
Method Code	093	087	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM

Appendix D Requirements - Network Design Criteria			
Site Type	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	3.8 meters	3.8 meters	3.6 meters
Airflow Arc	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	5.3 seconds	5.3 seconds	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway A	Dysart	Dysart	Dysart
Distance and Direction to Road	17 meters, W	17 meters, W	12 meters, W
Traffic Count (ADT)	12,000	12,000	12,000
Nearest Major Roadway B	Bell Rd	Bell Rd	Bell Rd
Distance and Direction to Road	495 meters, N	495 meters, N	460 meters, N
Traffic Count (ADT)	43,000	43,000	43,000
Groundcover	Paved/Gravel	Paved/Gravel	Paved/Gravel

FALCON FIELD

County ID: FF

AQS ID: 04-013-1010

Address: 4530 E McKellips Rd, Mesa

Coordinates: 33.45223N, -111.73331W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	O₃
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	26
Number of Accuracy Audits Performed Annually	3
Dates of Accuracy Audits on Gaseous Analyzer	01/13/16 02/24/16 06/29/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Bi-Weekly
Frequency of Flow Rate Verification	Not Applicable
Appendix C Requirements - Monitoring Methodology	
Date Established	06/01/1989
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Population Exposure
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	9.3 meters
Airflow Arc	360°

Probe Sample Line Material	Teflon™
Pollutant Sample Residence Time	18.8 seconds
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters
Distance from Closest Tree Dripline	> 20 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	McKellips
Distance and Direction to Road	58 meters, S
Traffic Count (ADT)	29,000
Groundcover	Paved

FOUNTAIN HILLS

County ID: FH

AQS ID: 04-013-9704

Address: 16426 E. Palisades Blvd., Fountain Hills

Coordinates: 33.61103N, -111.72529W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	O₃
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	26
Number of Accuracy Audits Performed Annually	2
Dates of Accuracy Audits on Gaseous Analyzer	04/12/16 12/19/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Bi-Weekly
Frequency of Flow Rate Verification	Not Applicable
Appendix C Requirements - Monitoring Methodology	
Date Established	04/01/1996
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	4.3 meters
Airflow Arc	360°
Probe Sample Line Material	Teflon™

Pollutant Sample Residence Time	4.2 seconds
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	9 meters
Distance from Closest Tree Dripline	15 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	Palisades Blvd
Distance and Direction to Road	70 meters, SW
Traffic Count (ADT)	8,000
Groundcover	Paved

GLENDALE
County ID: GL
AQS ID: 04-013-2001
Address: 6001 W Olive, Glendale
Coordinates: 33.57454N, -112.19196W
Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information				
Pollutant	CO	O₃	PM₁₀	PM_{2.5}
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs				
Number of Precision Checks Performed Annually	8	26	24	24
Number of Accuracy Audits Performed Annually	1	2	3	3
Dates of Accuracy Audits on Gaseous and PM Analyzers	03/03/16	05/02/16 10/11/16	01/21/16 07/19/16 10/11/16	01/21/16 07/19/16 10/11/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly	Bi-Weekly
Appendix C Requirements - Monitoring Methodology				
Date Established	01/01/1974	01/01/1974	07/01/1987	6/1/2011

Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Note: The same monitor measures PM₁₀ and PM_{2.5}.				
Method Code	093	087	208	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM ₁₀ and PM _{2.5} monitors	Not Applicable	Not Applicable	0 meters	0 meters
Note: The TEOM 1405-DF collects air for both PM₁₀ and PM_{2.5} measurements through the same inlet.				
Probe Inlet Height	3.7 meters	3.7 meters	3.4 meters	4.0 meters
Airflow Arc	360°	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable	Not Applicable
Pollutant Sample Residence Time	4.5 seconds	4.5 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters	> 20 meters

Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway A	Olive Ave	Olive Ave	Olive Ave	Olive Ave
Distance and Direction to Road	225 meters, S	225 meters, S	227 meters, S	227 meters, S
Traffic Count (ADT)	25,000	25,000	25,000	25,000
Nearest Major Roadway B	59 th Ave	59 th Ave	59 th Ave	59 th Ave
Distance and Direction to Road	475 meters, E	475 meters, E	430 meters, E	430 meters, E
Traffic Count (ADT)	30,500	30,500	30,500	30,500
Groundcover	Paved	Paved	Paved	Paved

GREENWOOD

County ID: GR

AQS ID: 04-013-3010

Address: 1128 N 27th Ave., Phoenix

Coordinates: 33.46093N, -112.11748W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information			
Pollutant	CO	NO₂	PM₁₀
Parameter Code	42101	42602	81102
Parameter Occurrence Code	1	1	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	Yes	Yes
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs			
Number of Precision Checks Performed Annually	12	11	11
Number of Accuracy Audits Performed Annually	3	2	2
Dates of Accuracy Audits on Gaseous and PM Analyzers	05/12/16 05/25/16 06/09/16	02/18/16 05/12/16	02/18/16 05/12/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements - Monitoring Methodology			
Date Established	11/01/1993	11/01/1993	11/01/1993
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 200T	Thermo - TEOM 1405-S
Method Code	093	099	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM
Appendix D Requirements - Network Design Criteria			
Site Type	Population Exposure	Population Exposure	Population Exposure

Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Middle	Middle	Middle
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	4.2 meters	4.2 meters	4.4 meters
Airflow Arc	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	5.3 seconds	5.3 seconds	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	> 20 meters	> 20 meters	> 20 meters
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway A	27 th Ave	27 th Ave	27 th Ave
Distance and Direction to Road	10 meters, E	10 meters, E	10 meters, E
Traffic Count (ADT)	18,500	18,500	18,500
Nearest Major Roadway B	I-10	I-10	I-10
Distance and Direction to Road	85 meters, N	85 meters, N	85 meters, N
Traffic Count (ADT)	229,000	229,000	229,000
Groundcover	Paved	Paved	Paved

HIGLEY

County ID: HI

AQS ID: 04-013-4006

Address: 2207 S Higley Rd., Gilbert

Coordinates: 33.30994 N, -111.72002 W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	PM₁₀
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes
Note: Site reopened at new location in Q1-2017 – same AQS ID.	
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Not Applicable
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	Not operating
Number of Accuracy Audits Performed Annually	Not operating
Dates of Accuracy Audits on PM Analyzer	Not operating
All Precision/Bias Reports Submitted to AQS?	No checks
Annual Data Certification Submitted?	No data
Frequency of One-Point QC Check	Not Applicable
Frequency of Flow Rate Verification	Bi-Weekly
Appendix C Requirements - Monitoring Methodology	
Date Established	07/01/2000
Monitor Type	SLAMS
Monitor Make - Model	Thermo – TEOM 1405-S
Method Code	079
PM Monitor Flow Type	Low Volume
PM Monitor Collection Type	Size Specific
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Population Exposure
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	3.4 meters

Airflow Arc	360°
Probe Sample Line Material	Not relevant
Pollutant Sample Residence Time	Not Applicable
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters
Distance from Closest Tree Dripline	> 20 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway A	Higley Rd
Distance and Direction to Road	117 meters, E
Traffic Count (ADT)	11,500
Nearest Major Roadway B	Williams Field Rd
Distance and Direction to Road	410 meters, S
Traffic Count (ADT)	11,500
Groundcover	Paved

HUMBOLDT MOUNTAIN

County ID: HM

AQS ID: 04-013-9508

Address: E State Hwy 562- FAA Radar Station, Tonto National Forest

Coordinates: 33.98280N, -111.79870W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	O₃
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	27
Number of Accuracy Audits Performed Annually	4
Dates of Accuracy Audits on Gaseous Analyzer	02/08/16 05/02/16 08/29/16 10/20/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Bi-Weekly
Frequency of Flow Rate Verification	Not Applicable
Appendix C Requirements - Monitoring Methodology	
Date Established	01/01/1993
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Regional
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	3.4 meters

Airflow Arc	360°
Probe Sample Line Material	Teflon™
Pollutant Sample Residence Time	6.9 seconds
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	6 meters
Distance from Closest Tree Dripline	> 20 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	Not Applicable Remote mountaintop location is reached by access road E State Hwy 562
Distance and Direction to Road	Not Applicable
Traffic Count (ADT)	Not Applicable
Groundcover	Dirt/Vegetated

MESA
 County ID: ME
 AQS ID: 04-013-1003
 Address: 310 S Brooks, Mesa
 Coordinates: 33.41045N, -111.86507W
 Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information				
Pollutant	CO	O₃	PM₁₀	PM_{2.5}
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs				
Number of Precision Checks Performed Annually	15	26	25	26
Number of Accuracy Audits Performed Annually	3	3	4	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	03/23/16 09/07/16 11/03/16	04/06/16 05/05/16 12/14/16	02/11/16 02/25/16 05/05/16 10/19/16	02/11/16 02/25/16 05/05/16 10/19/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly	Bi-Weekly
Appendix C Requirements - Monitoring Methodology				

Date Established	01/01/1978	11/1/2012	11/1/2012	11/1/2012
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Note: The same monitor measures PM₁₀ and PM_{2.5}.				
Method Code	093	087	208	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM ₁₀ and PM _{2.5} monitors	Not Applicable	Not Applicable	0 meters	0 meters
NOTE: The TEOM 1405-DF collects air for both PM₁₀ and PM_{2.5} measurements through the same inlet.				
Probe Inlet Height	5 meters	5 meters	6.2 meters	6.9 meters
Airflow Arc	360°	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable	Not Applicable
Pollutant Sample Residence Time	6.3 seconds	6.3 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters	> 20 meters

Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	Broadway Rd.	Broadway Rd.	Broadway Rd.	Broadway Rd.
Distance and Direction to Road	305 meters, S	305 meters, S	305 meters, S	305 meters, S
Traffic Count (ADT)	33,000	33,000	33,000	33,000
Groundcover	Paved/Gravel	Paved/Gravel	Paved/Gravel	Paved/Gravel

NORTH PHOENIX

County ID: NP

AQS ID: 04-013-1004

Address: 601 E Butler Dr., Phoenix

Coordinates: 33.56033N, -112.06626W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information				
Pollutant	CO	O₃	PM₁₀	PM_{2.5}
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs				
Number of Precision Checks Performed Annually	6	26	25	26
Number of Accuracy Audits Performed Annually	1	3	4	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	03/22/16	05/17/16 08/22/16 12/13/16	05/02/16 09/06/16 10/18/16 11/28/16	05/02/16 09/06/16 10/18/16 11/28/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly	Bi-Weekly

Appendix C Requirements - Monitoring Methodology				
Date Established	01/01/1974	01/01/1975	9/1/2011	9/1/2011
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
<i>Note: The same monitor measures PM₁₀ and PM_{2.5}.</i>				
Method Code	093	087	208	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM ₁₀ and PM _{2.5} monitors	Not Applicable	Not Applicable	0 meters	0 meters
<i>NOTE: The TEOM 1405-DF collects air for both PM₁₀ and PM_{2.5} measurements through the same inlet.</i>				
Probe Inlet Height	4.6 meters	4.6 meters	4.5 meters	4.5 meters
Airflow Arc	360°	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable	Not Applicable
Pollutant Sample Residence Time	4.5 seconds	4.5 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction

Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	7 th Street	7 th Street	7 th Street	7 th Street
Distance and Direction to Road	75 meters, E	75 meters, E	75 meters, E	75 meters, E
Traffic Count (ADT)	32,000	32,000	32,000	32,000
<i>Note: The CO monitor's spacing from nearest roadway and its associated ADT count did not meet EPA requirements. This was resolved when the monitor's operation was discontinued in 2016.</i>				
Groundcover	Gravel	Gravel	Gravel	Gravel

PINNACLE PEAK

County ID: PP

AQS ID: 04-013-2005

Address: 24295 N Alma School Rd., Scottsdale

Coordinates: 33.70632N, -111.85562W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	O₃
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	23
Number of Accuracy Audits Performed	4
Dates of Accuracy Audits on Gaseous Analyzer	02/02/16 03/15/16 07/07/16 12/19/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Bi-Weekly
Frequency of Flow Rate Verification	Not Applicable
Appendix C Requirements - Monitoring Methodology	
Date Established	02/01/1988
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Urban
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
-Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	6.1 meters

Airflow Arc	360°
Probe Sample Line Material	Teflon™
Pollutant Sample Residence Time	4.3 seconds
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	6 meters
Distance from Closest Tree Dripline	6 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	Happy Valley Rd.
Distance and Direction to Road	61 meters, S
Traffic Count (ADT)	16,000
Groundcover	Paved/Grass

RIO VERDE

County ID: RV

AQS ID: 04-013-9706

Address: 25608 N Forest Rd., Rio Verde

Coordinates: 33.71881N, -111.67183W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	O₃
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	26
Number of Accuracy Audits Performed Annually	4
Dates of Accuracy Audits on Gaseous Analyzer	03/14/16 06/07/16 10/11/16 12/06/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Bi-Weekly
Frequency of Flow Rate Verification	Not Applicable
Appendix C Requirements - Monitoring Methodology	
Date Established	01/01/1997
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Urban
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Inlet Height	6.2 meters

Airflow Arc	360°
Probe Sample Line Material	Teflon™
Pollutant Sample Residence Time	19.95 seconds
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstructions
Distance from Obstructions Not on Roof	> 20 meters
Distance from Closest Tree Dripline	> 20 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	Forest Rd
Distance and Direction to Road	43 meters, E
Traffic Count (ADT)	4,766
Groundcover	Paved

SOUTH PHOENIX

County ID: SP

AQS ID: 04-013-4003

Address: 33 W Tamarisks, Phoenix

Coordinates: 33.40316N, -112.07533W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information				
Pollutant	CO	O₃	PM₁₀	PM_{2.5}
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs				
Number of Precision Checks Performed Annually	12	26	27	27
Number of Accuracy Audits Performed Annually	3	4	4	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	03/04/16 09/14/16 10/13/16	02/17/16 04/13/16 11/09/16 12/07/16	02/03/16 05/11/16 08/03/16 11/09/16	02/03/16 05/11/16 08/03/16 11/09/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly	Bi-Weekly
Appendix C Requirements - Monitoring Methodology				
Date Established	10/01/1999	10/01/1999	7/1/2007	05/01/2010
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS

Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405- DF	Thermo - TEOM 1405- DF
Note: The same monitor measures PM₁₀ and PM_{2.5}.				
Method Code	093	087	208	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM ₁₀ and PM _{2.5} monitors	Not Applicable	Not Applicable	0 meters	0 meters
Note: The TEOM 1405-DF collects air for both PM₁₀ and PM_{2.5} measurements through the same inlet.				
Probe Inlet Height	5.5 meters	5.5 meters	4.3 meters	4.3 meters
Airflow Arc	360°	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable	Not Applicable
Pollutant Sample Residence Time	4.7 seconds	4.7 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	11 meters	11 meters	11 meters	11 meters
Distance from Closest Tree Dripline	11 meters	11 meters	11 meters	11 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue

Nearest Major Roadway A	Central Ave.	Central Ave.	Central Ave.	Central Ave.
Distance and Direction to Road	168 meters, E	168 meters, E	165 meters, E	165 meters, E
Traffic Count (ADT)	24,000	24,000	24,000	24,000
Nearest Major Roadway B	Broadway Rd	Broadway Rd	Broadway Rd	Broadway Rd
Distance and Direction to Road	385 meters, N	385 meters, N	385 meters, N	385 meters, N
Traffic Count (ADT)	18,000	18,000	18,000	18,000
Groundcover	Paved	Paved	Paved	Paved

SOUTH SCOTTSDALE

County ID: SS

AQS ID: 04-013-3003

Address: 2857 N Miller Rd., Scottsdale

Coordinates: 33.47968N, -111.91721W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information			
Pollutant	CO	O₃	PM₁₀
Parameter Code	42101	44201	81102
Parameter Occurrence Code	1	1	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs			
Number of Precision Checks Performed Annually	6	25	15
Number of Accuracy Audits Performed Annually	1	4	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	03/09/16	02/10/16 09/07/16 10/31/16 11/28/16	02/10/16 10/17/16 11/28/16 12/12/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements - Monitoring Methodology			
Date Established	01/01/1974	01/01/1974	09/01/2012
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-S
Method Code	093	087	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM
Appendix D Requirements - Network Design Criteria			

Site Type	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	5.8 meters	5.8 meters	6.1 meters
Airflow Arc	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	8.0 seconds	8.0 seconds	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway A	Thomas	Thomas	Thomas
Distance and Direction to Road	66 meters, N	66 meters, N	62 meters, N
Traffic Count (ADT)	33,000	33,000	33,000
Nearest Major Roadway B	Miller Rd.	Miller Rd.	Miller Rd.
Distance and Direction to Road	32 meters, W	32 meters, W	35 meters, W
Traffic Count (ADT)	13,000	13,000	13,000
<i>Note: The CO monitor's spacing from nearest roadway and its associated ADT count did not meet EPA requirements. This was resolved when the monitor's operation was discontinued in 2016.</i>			
Groundcover	Paved	Paved	Paved

TEMPE

County ID: TE

AQS ID: 04-013-4005

Address: 1525 S College Ave., Tempe

Coordinates: 33.4124N, -111.93473W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information				
Pollutant	CO	O₃	PM₁₀	PM_{2.5}
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs				
Number of Precision Checks Performed Annually	7	26	26	26
Number of Accuracy Audits Performed Annually	1	3	3	3
Dates of Accuracy Audits on Gaseous & PM Analyzers	03/15/16	05/12/16 07/07/16 11/21/16	03/15/16 11/08/16 11/09/16	03/15/16 11/08/16 11/09/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly	Bi-Weekly
Appendix C Requirements - Monitoring Methodology				
Date Established	07/01/2000	07/01/2000	3/1/2012	3/1/2012
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API - 300T	Teledyne API - 400T	Thermo - TEOM 1405- DF	Thermo - TEOM 1405- DF

<i>Note: The same monitor measures PM₁₀ and PM_{2.5}.</i>				
Method Code	093	087	208	182
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM ₁₀ and PM _{2.5} monitors	Not Applicable	Not Applicable	0 meters	0 meters
<i>Note: The TEOM 1405-DF collects air for both PM₁₀ and PM_{2.5} measurements through the same inlet.</i>				
Probe Inlet Height	4.4 meters	4.4 meters	2.7 meters	3.7 meters
Airflow Arc	360°	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable	Not Applicable
Pollutant Sample Residence Time	4.7 seconds	4.7 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	Apache Blvd.	Apache Blvd.	Apache Blvd.	Apache Blvd.
Distance and Direction to Road	370 meters, N	370 meters, N	370 meters, N	370 meters, N

Traffic Count (ADT)	32,170	32,170	32,170	32,170
Groundcover	Gravel	Gravel	Gravel	Gravel

THIRTY-THIRD

County ID: TT

AQS ID: 04-013-4020

Address: 3248 W Moreland Ave., Phoenix

Coordinates: 33.46155N, -112.12815W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information			
Pollutant	CO	NO₂	PM_{2.5}
Parameter Code	42101	42602	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	No	Yes
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	No	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of Precision Checks Performed Annually	6	25	6
Number of Accuracy Audits Performed Annually	0	3	1
Dates of Accuracy Audits on Gaseous & PM Analyzers	No Dates (Analyzer removed before scheduled audits were required.)	03/10/16 04/08/16 08/11/16	02/11/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements - Monitoring Methodology			
Date Established	09/01/2015	09/01/2015	09/01/2015
Monitor Type	SPM	SLAMS	SPM
Monitor Make - Model	Teledyne API – 300T	Teledyne API - 200T	Thermo - TEOM 1405-DF
Method Code	093	099	182
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM
Appendix D Requirements - Network Design Criteria			
Site Type	Source-Oriented	Source-Oriented	Source-Oriented
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Micro	Micro	Micro

Monitoring Season	Jan-Mar	Jan-Dec	Jan-Mar
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	4.3 meters	4.3 meters	3.6 meter
Airflow Arc	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	4.4	4.4 sec	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 10 meters	> 10 meters	> 10 meters
Distance from Closest Tree Dripline	> 10 meters	> 10 meters	> 10 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	I-10	I-10	I-10
Distance and Direction to Road	13.5 meters, N	13.5 meters, N	13.5 meters, N
Traffic Count (ADT)	245,632	245,632	245,632
Groundcover	Gravel	Gravel	Gravel

WEST CHANDLER

County ID: WC

AQS ID: 04-013-4004

Address: 275 S Ellis, Chandler

Coordinates: 33.29898N, -111.88431W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information			
Pollutant	CO	O₃	PM₁₀
Parameter Code	42101	44201	81102
Parameter Occurrence Code	1	1	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (sample filters only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs			
Number of Precision Checks Performed Annually	15	26	27
Number of Accuracy Audits Performed Annually	3	4	4
Dates of Accuracy Audits on Gaseous & PM Analyzers	09/14/16 03/04/16 10/13/16	04/13/16 04/27/16 07/07/16 10/13/16	03/04/16 06/08/16 09/14/16 12/07/16
All Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Bi-Weekly
Appendix C Requirements - Monitoring Methodology			
Date Established	07/01/2000	07/01/2000	07/01/2000
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo – TEOM 1405-S
Method Code	093	087	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FRM	FEM	FEM
Appendix D Requirements - Network Design Criteria			

Site Type	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Middle
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers	Not Applicable	Not Applicable	Not Applicable
Probe Inlet Height	4.4 meters	4.4 meters	4.4 meters
Airflow Arc	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Not Applicable
Pollutant Sample Residence Time	4.5 seconds	4.5 seconds	Not Applicable
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant
Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	14 meters	14 meters	14 meters
Distance from Closest Tree Dripline	14 meters	14 meters	14 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway A	Frye Rd.	Frye Rd.	Frye Rd.
Distance and Direction to Road	30 meters, S	30 meters, S	30 meters, S
Traffic Count (ADT)	10,566	10,566	10,566
Groundcover	Pavement/Gravel	Pavement/Gravel	Pavement/Gravel

WEST 43RD AVENUE
 County ID: WF
 AQS ID: 04-013-4009
 Address: 3940 W Broadway Rd., Phoenix
 Coordinates: 33.40642N, -112.14434W
 Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	PM₁₀
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	27
Number of Accuracy Audits Performed Annually &	3
Dates of Accuracy Audits on the PM Analyzer	03/09/16 11/28/16 12/12/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Not Applicable
Frequency of Flow Rate Verification	Bi-Weekly
Appendix C Requirements - Monitoring Methodology	
Date Established	04/01/2002
Monitor Type	SLAMS
Monitor Make - Model	Thermo - TEOM 1405-S
Method Code	079
PM Monitor Flow Type	Low Volume
PM Monitor Collection Type	Size Specific
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Highest Concentrations
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Middle
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable

Probe Inlet Height	5 meters
Airflow Arc	360°
Probe Sample Line Material	Not Applicable
Pollutant Sample Residence Time	Not Applicable
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters
Distance from Closest Tree Dripline	> 20 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway A	Broadway Rd. (E of 35 th Ave.)
Distance and Direction to Road	37 meters, S
Traffic Count (ADT)	12,501
Nearest Major Roadway B	35 th Ave. (N of Broadway Rd.)
Distance and Direction to Road	1 kilometer, E
Traffic Count (ADT)	19,699
Groundcover	Gravel

WEST PHOENIX

County ID: WP

AQS ID: 04-013-0019

Address: 3847 W Earll, Phoenix

Coordinates: 33.48385N, -112.14257W

Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information						
Pollutant	CO	NO ₂	O ₃	PM ₁₀	PM _{2.5} Primary	PM _{2.5} Secondary
<i>Note: This is a collocated site for PM_{2.5}.</i>						
Parameter Code	42101	42602	44201	81102	88101	88101
Parameter Occurrence Code	1	1	1	1	3	2
Collection Frequency	Continuous	Continuous	Continuous	Continuous	Continuous	1 in 12 days
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	<i>As per 40 CFR Part 50, Appendix L</i>
Analytical Laboratory (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Inter-Mountain Labs, Inc.
Any Proposal to Remove or Move Monitor?	No	No	No	No	No	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes	Yes	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs						
Number of Precision Checks Performed Annually	26	26	26	23	24	11
Number of Collocated Assessments	Not Applicable	Not Applicable	Not Applicable	Not Applicable	31	

(QA Filter Samples)						
Number of Accuracy Audits Performed Annually	4	4	5	3	3	2
Dates of Accuracy Audits on Gaseous & PM Analyzers / Sampler	03/22/16 09/06/16 11/29/16 12/13/16	02/09/16 07/26/16 09/06/16 12/22/16	02/09/16 02/23/16 07/26/16 09/06/16 12/13/16	03/21/16 09/06/16 10/18/16	03/21/16 09/06/16 10/18/16	03/24/16 10/11/16
Precision/Bias Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes	Yes
Annual Data Certification Submitted?	04/07/17	04/07/17	04/07/17	04/07/17	04/07/17	04/07/17
Frequency of One-Point QC Check	Bi-Weekly	Bi-Weekly	Bi-Weekly	Not Applicable	Not Applicable	Not Applicable
Frequency of Flow Rate Verification	Not Applicable	Not Applicable	Not Applicable	Bi-Weekly	Bi-Weekly	Bi-weekly
Appendix C Requirements - Monitoring Methodology						
Date Established	01/01/84	05/24/90	01/01/84	02/01/88	09/01/05	06/13/00
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne - API 300T	Teledyne - API 200T	Teledyne - API 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF	Thermo - Partisol 2025
<i>Notes: The same monitor collects PM₁₀ and PM_{2.5} hourly (continuous) measurements. The collocated Partisol 2025 sampler collects a QA filter sample once every 12 days.</i>						
Method Code	093	099	087	208	182	145
PM Monitor Flow Type	Not Applicable	Not Applicable	Not Applicable	Low Volume	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Not Applicable	Dichotomous	Dichotomous	Size Specific & Sequential
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM	FEM	FEM	FRM
Appendix D Requirements - Network Design Criteria						

Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Highest Concentration	Highest Concentration
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes	Yes	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria						
Distance between collocated PM _{2.5} monitors	Not Applicable	Not Applicable	Not Applicable	2 meters	2 meters	2 meters
<i>Note: Following site improvements in 2016, the secondary monitor's distance to the primary now meets EPA specifications.</i>						
Distance between PM ₁₀ and PM _{2.5} monitors	Not Applicable	Not Applicable	Not Applicable	0 meters	0 meters	2 meters
<i>Note: The TEOM 1405-DF collects air for both PM₁₀ and PM_{2.5} measurements through the same inlet.</i>						
Probe Inlet Height	4.3 meters	4.3 meters	4.3 meters	4.3 meters	4.3 meters	2.8 meters
Airflow Arc	360°	360°	360°	360°	360°	360°
Probe Sample Line Material	Teflon™	Teflon™	Teflon™	Not Applicable	Not Applicable	Teflon™
Pollutant Sample Residence Time	5.0 seconds	5.0 seconds	5.0 seconds	Not Applicable	Not Applicable	Not Applicable
Filter Sample Material	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Teflon™
Distance from Supporting Structure	Not Relevant	Not Relevant	Not Relevant	Not Relevant	Not Relevant	Not Relevant

Distance from Obstructions on Roof	No Obstruction	No Obstruction	No Obstruction	No Obstruction	No Obstruction	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters	> 20 meters	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance from Closest Tree Dripline	> 20 meters	> 20 meters	> 20 meters	> 20 meters	> 20 meters	> 20 meters
Distance to Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue	No Furnace Flue
Nearest Major Roadway	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.
Distance and Direction to Road	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S
Traffic Count (ADT)	29,000	29,000	29,000	29,000	29,000	29,000
Groundcover	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel

ZUNI HILLS
County ID: ZH
AQS ID: 04-013-4016
Address: 10851 W Williams Rd., Sun City
Coordinates: 33.68674N, -112.29417W
Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa

General Information	
Pollutant	PM₁₀
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (sample filters only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Is site suitable for comparison to PM _{2.5} NAAQS per Part 58.30?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements- Quality Assurance Requirements for SLAMS and SPMs	
Number of Precision Checks Performed Annually	25
Number of Accuracy Audits Performed Annually	4
Dates of Accuracy Audits on the PM Analyzer	06/09/16 09/01/16 10/12/16 12/08/16
All Precision/Bias Reports Submitted to AQS?	Yes
Annual Data Certification Submitted?	04/07/17
Frequency of One-Point QC Check	Not Applicable
Frequency of Flow Rate Verification	Bi-Weekly
Appendix C Requirements - Monitoring Methodology	
Date Established	12/01/09
Monitor Type	SLAMS
Monitor Make - Model	Thermo - TEOM 1405-S
Method Code	079
PM Monitor Flow Type	Low Volume
PM Monitor Collection Type	Size Specific
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Population Exposure
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood Scale
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	

Distance between collocated samplers	Not Applicable
Probe Inlet Height	2.3 meters
Airflow Arc	360°
Probe Sample Line Material	Not Applicable
Pollutant Sample Residence Time	Not Applicable
Distance from Supporting Structure	Not Relevant
Distance from Obstructions on Roof	No Obstruction
Distance from Obstructions Not on Roof	> 20 meters
Distance from Closest Tree Dripline	> 20 meters
Distance to Furnace Flue	No Furnace Flue
Nearest Major Roadway	Williams Rd.
Distance and Direction to Road	200 meters, N
Traffic Count (ADT)	2,567
Groundcover	Lawn/Dirt

APPENDIX III - PUBLIC NOTICE AND COMMENT INFORMATION

2016 Public Notice Announcement

Figure 17 shows the 2016 public notice and news release information.

2016 Public Notice Announcement

The Maricopa County Air Quality Department will hold a public meeting to discuss our 2016 Annual Monitoring Network Plan (AMNP). The AMNP reports the 2016 ambient air monitoring activity captured by the department's 26 air monitoring sites throughout Maricopa County. The AMNP provides a summary of the airborne pollutants measured, the air monitoring network design, air monitoring site details, and statistical analyses of pollutant data from 2016 among other information. The plan also covers proposed changes to the county's air monitoring network.

This year's public comment meeting will be held June 8, 2017, at 10 a.m. at the Air Monitoring Division's office located at: 2145 S. 11th Ave. Suite 170, Phoenix, AZ 85007. The purpose of the meeting is to receive and discuss in person comments from the public regarding the draft ANMP. Members of the public may comment in person at the meeting or through written statements to the department.

Additional information on the AMNP may be obtained by contacting Ben Davis at: 2145 S. 11th Avenue #170, Phoenix, AZ 85007 or (602) 258-5155, ext. 221. An electronic copy of the Final Draft 2016 AMNP is currently available on the department's website at: <http://www.maricopa.gov/3571/The-Library>.

Hard copies of the document may be requested from the department's Records Management Coordinator at (602) 506-6201 or at the department's address: 1001 North Central Avenue, Phoenix, Arizona 85004. Arrangements may be made to view the information every Monday through Friday (excluding major holidays) between 8 a.m. and 4:30 p.m. There is a small fee for copying available documents.

Written comments must state the name and mailing address of the person commenting and be signed by that person, an authorized agent or attorney. Written comments may be mailed to the Air Monitoring Division's address shown above or emailed to: bdavis@mail.maricopa.gov. All comments are due to the department by 5 p.m. Monday, June 19, 2016.

A sign language and/or Spanish interpreter will be made available upon request with a 72-hour notice. Additional reasonable accommodations will be made available to the extent possible within the timeframe of the request.

Figure 17. 2016 Public Announcement

Public Comments Received

This year, MAG submitted comments as shown below in Figure 19. In addition, we received internal comments pertaining to the style of the cover page and use of the new departmental logo. As a result, the document’s cover page now shows the new logo.

Comments on MCAQD 2016 Air Monitoring Network Plan Maricopa Association of Governments	
Page	Comment
16	In first line of fourth paragraph, revise the 1979 one-hour ozone standard from “0.012 ppm” to “0.12 ppm”.
19	In the second line of the first paragraph, revise “burning” to “burning of”.
19	In the seventh line of the first paragraph, suggest revising “dry deposition on plants, and” to “dry deposition,”.
23	In the third line of the first paragraph - “to meet the involved specifying” - it appears that there is a missing word(s).
23	In the fourth line of the first paragraph, revise “necesay7” to “necessary” and revise “tato” to “that”.
26	In the heading of Table 8, suggest revising “AQS Code” to “AQS ID” to be consistent with Table 7.
28	In the second line of the second paragraph, revise “AQS is” to “AQS are”.
30	In the first line of the second paragraph, delete “and”.
31	In the eighth line of the fourth paragraph, replace “Error! Reference source not found” with name of the referenced section.
44	In the third line of the first paragraph, revise “substituted the” to “substituted for the”.
45	In the fifth line of the first paragraph, revise “summaries” to “summarizes”.
51	In the heading of Figure 12, suggest removing “8/21/2016”.
55	In Table 29, revise “1.01+” to “1.01” in the row for Glendale, as this value does not equal a violation after rounding per Appendix K to 40 CFR Part 50.
56	In Table 30, revise “0” to “0.33” in the 3-Yr. Avg. Rate of Expected Exceedances column for Buckeye.
59	In the first line of the fourth paragraph, revise “For the Higley” to “The Higley”.
60	In the fourth line of the fourth paragraph, revise “advanced” to “advance”.

Comments on MCAQD 2016 Air Monitoring Network Plan

Maricopa Association of Governments

Page	Comment
62	In the fourth line of the second paragraph, revise “(PAMS), the” to “(PAMS), and the”.
76	In the third sentence of the first paragraph, suggest revising “monitors” to “monitored” since the Greenwood monitor is now closed.
76	In the fourth sentence of the first paragraph, suggest revising “operating” to “operated” since the Greenwood monitor is now closed.
86	In the second heading of the figure with a picture of the monitoring site, suggest moving “Phoenix” to same line as “Ave.,” to be consistent with the other site descriptions.
87	In the first line of the first paragraph, suggest revising “Wide ranges” to “A wide range”.
96	In the “Probe Sample Line Material” row of the table, suggest revising “Teflon” to Teflon™ for consistency.
152	In the “AMNP” definition, suggest revising “EPA” to “U.S. EPA”.
152	In third line of the “Attainment” definition, suggest revising “EPA” to “U.S. EPA”.
153	In the “Continuous monitor” definition, suggest revising “Continuous monitor” to “Continuous Monitor” for consistency with other definition titles.
154	In the “MO” definition, revise “monitoring organization” to “Monitoring organization”.
155	In the first line of the “NCORE” definition, revise “site” to “is”.
155	In the first line of the “OAQPS” definition, suggest revising “Standards located” to “Standards, located”.
156	In the second line of the “PM _{10-2.5} definition, revise “as a lone a criteria” to “as a lone criteria”.
156	In the “Primary Standard” definition, suggest removing blank line between “Primary” and “Standard”.
157	In the “Secondary Standard” definition, suggest removing blank line between “Secondary” and “Standard”.

Figure 19. Comments Received from MAG

Maricopa County's Response to Public Comments

MCAQD's Changes To Plan Document As Per MAG Comments			
Comments on MCAQD 2016 Air Monitoring Network Plan Maricopa Association of Governments			
Initial Page #	Comment	Final Page #	MCAQD Comment
16	In first line of fourth paragraph, revise the 1979 one-hour ozone standard from "0.012 ppm" to "0.12 ppm".	17	Changed as Suggested
19	In the second line of the first paragraph, revise "burning" to "burning of".	20	
19	In the seventh line of the first paragraph, suggest revising "dry deposition on plants, and" to "dry deposition,".	20	
23	In the third line of the first paragraph - "to meet the involved specifying" - it appears that there is a missing word(s).	25	Fixed paragraph and removed awkward sentence
23	In the fourth line of the first paragraph, revise "necesity7" to "necessary" and revise "tato" to "that".	25	Changed as Suggested
26	In the heading of Table 8, suggest revising "AQS Code" to "AQS ID" to be consistent with Table 7.	28	Changed to "AQS ID#"
28	In the second line of the second paragraph, revise "AQS is" to "AQS are".	30	Changed as Suggested
30	In the first line of the second paragraph, delete "and".	32	
31	In the eighth line of the fourth paragraph, replace "Error! Reference source not found" with name of the referenced section.	33	Formatting Fixed
44	In the third line of the first paragraph, revise "substituted the" to "substituted for the".	46	Changed as Suggested

MCAQD's Changes To Plan Document As Per MAG Comments

Comments on MCAQD 2016 Air Monitoring Network Plan

Maricopa Association of Governments

Initial Page #	Comment	Final Page #	MCAQD Comment
45	In the fifth line of the first paragraph, revise “summaries” to “summarizes”.	47	Changed as Suggested
51	In the heading of Figure 12, suggest removing “8/21/2016”.	53	
55	In Table 29, revise “1.01†” to “1.01” in the row for Glendale, as this value does not equal a violation after rounding per Appendix K to 40 CFR Part 50.	57	
56	In Table 30, revise “0” to “0.33” in the 3-Yr. Avg. Rate of Expected Exceedances column for Buckeye.	58	
59	In the first line of the fourth paragraph, revise “For the Higley” to “The Higley”.	61	
60	In the fourth line of the fourth paragraph, revise “advanced” to “advance”.	62	
62	In the fourth line of the second paragraph, revise “(PAMS), the” to “(PAMS), and the”.	64	
76	In the third sentence of the first paragraph, suggest revising “monitors” to “monitored” since the Greenwood monitor is now closed.	78	
76	In the fourth sentence of the first paragraph, suggest revising “operating” to “operated” since the Greenwood monitor is now closed.	78	
86	In the second heading of the figure with a picture of the monitoring site, suggest moving “Phoenix” to same line as “Ave.,” to be consistent with the other site descriptions.	88	
87	In the first line of the first paragraph, suggest revising “Wide ranges” to “A wide range”.	89	
96	In the “Probe Sample Line Material” row of the table, suggest revising “Teflon” to Teflon™ for consistency.	98	
152	In the “AMNP” definition, suggest revising “EPA” to “U.S. EPA”.	165	
152	In third line of the “Attainment” definition, suggest revising “EPA” to “U.S. EPA”.	165	

MCAQD's Changes To Plan Document As Per MAG Comments			
Comments on MCAQD 2016 Air Monitoring Network Plan Maricopa Association of Governments			
Initial Page #	Comment	Final Page #	MCAQD Comment
153	In the "Continuous monitor" definition, suggest revising "Continuous monitor" to "Continuous Monitor" for consistency with other definition titles.	166	Changed as Suggested
154	In the "MO" definition, revise "monitoring organization" to "Monitoring organization".	167	
155	In the first line of the "NCORE" definition, revise "site" to "is".	168	
155	In the first line of the "OAQPS" definition, suggest revising "Standards located" to "Standards, located".	168	
156	In the second line of the "PM _{10-2.5} " definition, revise "as a lone a criteria" to "as a lone criteria".	169	
156	In the "Primary Standard" definition, suggest removing blank line between "Primary" and "Standard".	169	Formatting Fixed
157	In the "Secondary Standard" definition, suggest removing blank line between "Secondary" and "Standard".	169	

Figure 20. MCAQD Responses to MAG Review Comments

APPENDIX IV – GLOSSARY

Key to Acronyms and Terms

98th percentile	The 98 th percentile is defined in <i>40 CFR Part 50 Appendix N</i> as “the smallest daily value out of a year of PM _{2.5} mass monitoring data below which no more than 98 percent of all daily values fall using the ranking and selection method specified in section 4.5(a) of this appendix”.
ADEQ:	Arizona Department of Environmental Quality
ADT:	Average Daily Traffic count
aka:	Also known as
AMD:	Air Monitoring Division
AMNP:	Air Monitoring Network Plan - an annual report produced for U.S. EPA each calendar year that provides comprehensive information regarding the performance of the County’s air quality surveillance system, e.g., network of SLAMS and SPM monitoring stations and / or sites, and the data collected and reported to EPA. The plan includes proposed future changes to the system as well.
Analyzer:	A monitor that samples the air and produces near real-time data without collecting a sample that must be laboratory analyzed.
ANSI:	American National Standards Institute
AQI:	Air Quality Index - the index that applies to each criteria pollutant and shows the concentration of each pollutant relative to its respective standard. When the AQI reaches 101, the pollutant’s concentration has exceeded the NAAQS.
AQS:	Air Quality System, sometimes defined as the Air Quality Subsystem. The AQS is the U.S. EPA’s ambient air database.
ASQ:	American Society for Quality
Attainment:	Attainment refers to a geographical area as being “in compliance” with a NAAQS and the U.S. Clean Air Act. After several years of no violations of a NAAQS, the U.S. EPA can classify a geographic area as in attainment for a particular CP.
AWT:	Average Weekday Traffic count
BAM:	Beta Attenuation Monitor. A continuous particulate measuring instrument used previously by MCAQD to measure PM ₁₀ .
CAA:	Clean Air Act
CASAC:	Clean Air Scientific Advisory Committee
CBSA:	Core-Based Statistical Area – is defined by the U.S. Office of Management and Budget as a statistical geographic entity consisting of the county or counties associated with at least one urbanized area/urban cluster of at least 10,000 in population, plus adjacent counties having a high degree of social and economic integration.

CFR:	The <i>Code of Federal Regulations</i> is published annually and contains the codification of the general and permanent rules published in the <i>Federal Register</i> by the executive departments and agencies of the Federal Government. An <i>eCFR</i> is a free electronic version; however, it is not the legal version.
Class I Area:	Federally designated parks or wilderness areas with mandated visibility protection.
CP:	Criteria Pollutant, or the Central Phoenix site, depending upon context
CO:	Carbon monoxide, a criteria pollutant
Collocated:	The practice of establishing a second pollutant monitor within a specified distance and of a specified type at a monitoring site for quality assurance purposes.
Continuous Monitor:	A method of monitoring air pollutants that is continually measuring the quantity of the pollutant, either gaseous or particulate. Continuous monitors are analyzers that can obtain real-time or short-term averages of pollutants. Continuous monitors may also be referred to as “automated” monitors.
Criteria Pollutants:	Six pollutants (CO, O ₃ , NO ₂ , Pb, PM, and SO ₂) that have NAAQS established by the U.S. EPA.
CSA:	Combined Statistical Area - is defined by the U.S. Office of Management and Budget as when very large cities combine two or more CBSAs, these larger areas are referred to as combined statistical areas
CSN:	The chemical speciation network - a nationwide, research air monitoring network designed to ferret-out the chemical constituents of and to discern trends in PM _{2.5} pollution. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
Delta T:	Difference between two levels of temperature measurements - Delta T is measured in the MCAQD network at heights of 2 and 10 meters. A higher temperature at the upper level indicates a temperature inversion.
Design Value:	A design value is a statistic that describes the air quality status of a given area relative to the level of the NAAQS. For a concentration-based standard, the air quality design value is simply the standard-related test statistic. The design value of a pollutant monitoring network is the highest sample value in the network used to compare to the NAAQS; i.e., the 24-hour PM _{2.5} design value for the network is the monitor with the highest 3-year average of the 98 th percentile.
EBAM:	E-Beta Attenuation Monitor - is a rugged, portable, battery or solar-operated analyzer that is suitable for obtaining and reporting continuous measurements of particulate matter in remote locations. EBAMs are often equipped with wind speed and direction instrumentation as well. EBAMs are particularly useful for temporary measurements of PM related to an event.
EPA R9:	Environmental Protection Agency Region 9

EE:	Exceptional Event – a high CP pollution event that is considered to be uncontrollable and caused by natural sources of pollution or an event that is not expected to recur at a given location. An EE can apply to any CP, but historically in Maricopa County, almost all EEs are related to high PM ₁₀ events.
Event:	Generally refers to a high pollution day where a NAAQS was exceeded.
Exceedance:	Generally refers to a high pollution day where a NAAQS was exceeded.
FDMS-TEOM:	Filter Dynamics Measurement System-Tapered Element Oscillating Microbalance - a continuous particulate analyzer used by MCAQD to measure PM _{2.5} .
FEM:	Federal Equivalent Method - an EPA-approved method of sampling and analyzing the ambient air for an air pollutant, i.e., includes the monitor and its operating firmware and procedure(s). An FEM must pass required testing found in <i>40 CFR Part 53</i> and show CP data produced are similar to the Federal Reference Method (FRM). Continuous particulate matter and some gaseous analyzers are FEMs.
Filter-based sampler:	A method of monitoring particulate pollution that involves exposing a pre-weighed filter to a specific flow rate for a prescribed period of time, usually midnight to midnight, or 1440 minutes. The filters are then post-weighed to determine the mass of particulates per volume, e.g., µg/m ³ . Filter samples are stored for a period and can be referenced later if needed.
FRM:	Federal Reference Method - an EPA-approved method of sampling and/or analyzing the ambient air for an air pollutant, i.e., includes the monitor and its operating firmware and procedure(s). An FRM must pass required testing found in <i>40 CFR Part 53</i> and show CP data produced are accurate based on acceptable precision and bias limits. These methods are the baseline that all other methods reference, e.g., Federal Equivalency Methods (FEM).
HAPs:	Hazardous Air Pollutants - airborne chemicals that are been listed in the federal Clean Air Act and have an associated standard or process requirement determined for it.
MAG:	Maricopa Association of Governments
MCAQCED:	Maricopa County Air Quality Compliance and Enforcement Division
MCAQD:	Maricopa County Air Quality Department
MO:	Monitoring organization
Monitor:	Monitor is a term that refers to an instrument, sampler, analyzer, or other device that measures or assists in the measurement of atmospheric air pollutants and which is acceptable for use in ambient air surveillance under the applicable provisions of <i>40 CFR Part 58 Appendix C</i> .
µg/m³:	micrograms per cubic meter
µm:	micrometers

MSA:	Metropolitan Statistical Area is designated by the U.S. Office of Management and Budget as a geographical area based on the concept of a core area with a large population nucleus, plus adjacent communities having a high degree of economic and social integration within that core. Metropolitan and micropolitan statistical areas are the two categories of CBSAs. Metropolitan areas have populations greater than 50,000, and micropolitan areas have populations between 10,000 and 50,000. The AMD operates air monitoring stations within the Phoenix-Mesa MSA, which includes portions of Maricopa and Pinal County.
NAAQS:	National Ambient Air Quality Standards - health and welfare-based standards established by the U.S. EPA that set permissible airborne concentration levels for the CPs.
NATTS:	National Air Toxics Trend Stations - a nationwide, research air monitoring program designed to measure toxic air pollutant trends. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
NCORE:	<u>National Core</u> multi-pollutant is a national network of multi-pollutant monitoring sites used to represent the nation as a whole. There are currently ~75 NCORE sites, 1 to 3 per state plus Washington D.C., Virgin Islands, and Puerto Rico located in both urban and rural areas. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
Network:	All stations of a given type or types
NO₂:	Nitrogen dioxide. The indicator compound used to gauge the ambient concentration of NO _x .
NO_x:	Nitrogen oxide(s), a criteria pollutant. NO _x is the sum of nitric oxide (NO), NO ₂ , and other nitrogen-containing compounds.
Nonattainment:	Means a geographical area is “not in compliance” with the NAAQS and the U.S. Clean Air Act. After several years of violating a NAAQS, the EPA can classify a geographic area as being in nonattainment for a particular criteria pollutant.
O₃:	Ozone, a criteria pollutant
OAQPS:	The U.S. EPA Office of Air Quality Planning and Standards, located in Research Triangle Park, N.C., which serves as EPA “Headquarters” for ambient air monitoring guidance and the NAAQS reviews.
PAMS:	Photochemical Ambient Monitoring Stations - a nationwide, research air monitoring program designed to measure specific airborne chemicals that are known to be “precursor pollutants” that form ozone when combined with ultraviolet light and heat. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
PCAQCD:	Pinal County Air Quality Control District
Pb:	Lead, a criteria pollutant

PM:	Particulate matter, also known as “particulates”, project manager, or preventative maintenance depending on context
PM_{2.5}:	Particulate matter 2.5 micrometers in aerometric diameter or smaller, a criteria pollutant. PM _{2.5} is also referred to as “fine” particulate matter.
PM₁₀:	Particulate matter 10 micrometers in aerometric diameter or smaller, a criteria pollutant
PM_{10-2.5} and / or PM_c:	“Coarse” particulate matter is less than 10 micrometers, but recently, has come to mean PM ₁₀ minus PM _{2.5} , not currently regulated as a lone criteria pollutant.
ppb:	parts per billion
ppm:	parts per million
PQAO:	Primary quality assurance organization - a monitoring organization (MO) or other organization that is responsible for a set of air monitoring stations that monitor the same pollutant and for which data quality assessments can be pooled. Each criteria pollutant sampler/monitor at a monitoring station in the SLAMS and SPM networks must be associated with one, and only one, primary quality assurance organization.
Primary Standard:	The portion of the NAAQS designed to protect public health.
QA:	Quality assurance – generally refers to the administrative or managerial processes in place to verify that quality control activities are successfully carried out by personnel and that data produced meet specified quality requirements prior to use, i.e., written guidance documents, program oversight activities, etc.
QC:	Quality control – generally refers to the technical activities in place to produce high quality data, i.e., air monitoring instruments operate within specified criteria, data collection from sites, etc.
Quality System:	The overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer. (see <i>ANSI/ASQ E4-2004</i>)
RRNS:	Rapid Response Notification System - a communication tool used by MCAQD to manage high pollution events by alerting residents, intergovernmental personnel, and stakeholders of increasing PM concentrations.
Sampler:	A type of air monitor that collects a physical sample for analysis. Air samples may be collected onto a filter, cartridge, or other medium, or into a device such as a canister.
Secondary Standard:	The portion of the NAAQS designed to protect public welfare and the environment.
SIP:	State Implementation Plan - a SIP is a plan produced by state and/or local regulatory agencies that specifies obligations that will be taken for a

geographic area in nonattainment to meet the NAAQS for a criteria pollutant. SIPs are also developed for maintaining compliance with the NAAQS.

- Site:** A site is a geographic location. One or more air monitoring stations can be located at a site.
- SLAMS:** State and Local Air Monitoring Station - the SLAMS network consist of approximately 5,000 monitoring stations nationwide whose size and distribution is largely determined by the needs of State and local air pollution control agencies to meet their respective SIP requirements. Other types of monitoring stations include: NCORE (national core) and SPM (special purpose). Currently, the AMD operates SLAMS only.
- SO₂:** Sulfur dioxide, a criteria pollutant
- SPM:** Special Purpose Monitor - a special purpose monitor provides data for special studies needed by the State and local agencies to support SIPs and other air program activities. The SPMs are not permanently established as part of a particular pollutant's monitoring station(s); their location can be adjusted easily to accommodate changing needs and priorities.
- SSI:** Size Selective Inlet - the inlet used on high- and low volume particulate samplers and analyzers to determine the size of particles sampled or measured by the monitor. The particle size separation process usually employs impaction, filtration, or cyclonic flow.
- Station:** A station may comprise a single CP monitor, or a group of monitors with a shared objective, located at a particular site.
- TEOM:** Tapered Element Oscillating Microbalance - a automated, continuous FEM PM analyzer used by MCAQD to measure PM₁₀ and/or PM_{2.5} concentrations, depending upon the instrument model and air sample inlet configuration(s).
- tpy:** tons per year
- UATMP:** Urban Air Toxics Monitoring Program - a nationwide research air monitoring program designed to measure toxic air pollutants within urban areas. This program is managed by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS).
- U.S. EPA:** United States Environmental Protection Agency
- VOC:** Volatile Organic Compound - VOCs are chemical compounds that can easily vaporize and enter the atmosphere. There are many natural and artificial sources of VOCs; solvents and gasoline make up some of the largest artificial sources. VOCs will react with NO_x in the presence of sunlight to create ground-level O₃ pollution.

Volume:

- a. The amount of air sampled for analysis. Volume is calculated by multiplying a monitor's flowrate by the collection time, usually in minutes.

$$\text{Volume} = \text{flowrate} \times \text{minutes}$$

- b. The amount of data in a file or database.