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2022 SERIOUS AREA PARTICULATE PLAN FOR PM-10 FOR THE WEST PINAL COUNTY NONATTAINMENT AREA

MARCH 2022

MARICOPA ASSOCIATION of GOVERNMENTS

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2022 SERIOUS AREA PARTICULATE PLAN FOR PM-10 FOR THE WEST PINAL COUNTY NONATTAINMENT AREA

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EXECUTIVE SUMMARY

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2022 SERIOUS AREA PARTICULATE PLAN FOR PM-10 FOR THE WEST PINAL COUNTY NONATTAINMENT AREA

EXECUTIVE SUMMARY

Within the West Pinal County nonattainment area, the National Ambient Air Quality Standards (NAAQS) have not yet been attained for particulate matter less than or equal to 10 micrometers (known as PM-10). The Maricopa Association of Governments was designated by the Governor of Arizona in 1978 and recertified by the Arizona Legislature in 1992 to serve as the Regional Air Quality Planning Agency to develop plans to address air pollution problem. This plan was prepared through a coordinated effort with the Arizona Department of Environmental Quality, Arizona Department of Transportation, Maricopa Association of Governments, Pinal County Air Quality Control District and the Sun Corridor Metropolitan Planning Organization.

On June 24, 2020, the Environmental Protection Agency published a final rule to determine that the West Pinal County Moderate PM-10 Nonattainment Area failed to attain the PM-10 standard by the December 31, 2018 attainment date and is reclassified as a Serious Area, effective July 24, 2020. The Serious Area attainment date is December 31, 2022.

The Clean Air Act requires that a Serious Area Particulate Plan for PM-10 include Best Available Control Measures that are designed to achieve the maximum degree of emissions reduction from a particulate source. The Best Available Control Measures are required to be implemented no later than four years after the reclassification effective date or by July 24, 2024. Also, the definition of major source is changed from 100 tons to 70 tons per year.

While the attainment date for Serious Areas is December 31, 2022, the Clean Air Act also allows the Environmental Protection Agency to extend the attainment date for up to five years if the following requirements are met:

- Attainment by December 31, 2022 is impracticable.
- Compliance with all requirements and commitments in the plan.
- Plan includes the Most Stringent Measures that are included in the plan of any State or are achieved in practice in any State, and can feasibly be implemented in the area.
- Attainment no later than December 31, 2027.

The formation of PM-10 particulate pollution in the West Pinal County nonattainment area is dependent upon several factors. Among these factors are meteorological factors such as stagnant air masses, temperature inversions, and high winds from thunderstorms and frontal systems. The fine, dry and silty soils characteristic of desert locations, including

the West Pinal County nonattainment area, promote the direct entrainment and suspension of PM-10, especially from recently disturbed surfaces. In the nonattainment area, high PM-10 concentrations occur throughout the year and generally occur on days with dry, stagnant conditions, and on days with high winds from thunderstorm outflows or passing frontal systems.

The 24-hour PM-10 standard is 150 micrograms per cubic meter ($\mu g/m^3$). Figure ES-1 includes the trend in PM-10 exceedance days for the West Pinal County nonattainment area at eight monitoring sites in 2016-2020. PM-10 exceedances caused by standard meteorological conditions and by high wind dust events have also been identified in Figure ES-1. 2020 PM-10 monitoring data in the West Pinal County nonattainment area indicates that attainment of the PM-10 standard by December 31, 2022 is impracticable. In order to demonstrate attainment of the PM-10 standard in the West Pinal County nonattainment area, an extension of the attainment date until December 31, 2026 is requested.

The 2017 baseline emissions inventory for the nonattainment area indicates that on an annual basis unpaved roads account for approximately 75% of annual PM-10 emissions. Windblown dust from a variety of land uses account for approximately 9% of annual PM-10 emissions, followed by agricultural tilling and harvesting at 5%, feedlots and dairies at 4%, construction at 3%, and fugitive dust from paved roads at 2%. A variety of other combustion and fugitive dust sources individually contribute less than 2% of annual PM-10 emissions. Figure ES-2 displays a pie chart of annual 2017 PM-10 emissions in the nonattainment area which total 41,168 tons.

A comprehensive planning effort was conducted to prepare the 2022 Serious Area Particulate Plan for PM-10. An extensive review of existing PM-10 control measures within the nonattainment area in comparison to ten other PM-10 nonattainment and maintenance areas was performed to identify candidate control measures. In total, 70 candidate control measures were jointly identified as Best Available Control Measures and Most Stringent Measures and included in a Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area. On May 26, 2021, the MAG Regional Council approved the Suggested List of Measures for consideration by implementing entities.

A broad range of commitments were received from Governor's Agricultural Best Management Practices Committee and the Pinal County Board of Supervisors for inclusion in the adopted plan. The commitments include measures to control PM-10 emissions for all significant sources of PM-10 within the nonattainment area. Collectively, 61 of the 70 suggested measures were included as committed measures.

In order to demonstrate attainment of the PM-10 standard, the PM-10 emission reduction benefits of the committed control measures were quantified. With the implementation of the committed control measures, the total PM-10 emissions in 2026 are 34,016 tons (see Figure ES-3) which represents a 17.4 percent reduction in the 2017 base year emissions.

Figure ES-1
2016-2020 24-Hour PM-10 Exceedance Days by Monitor in the West Pinal County Nonattainment Area

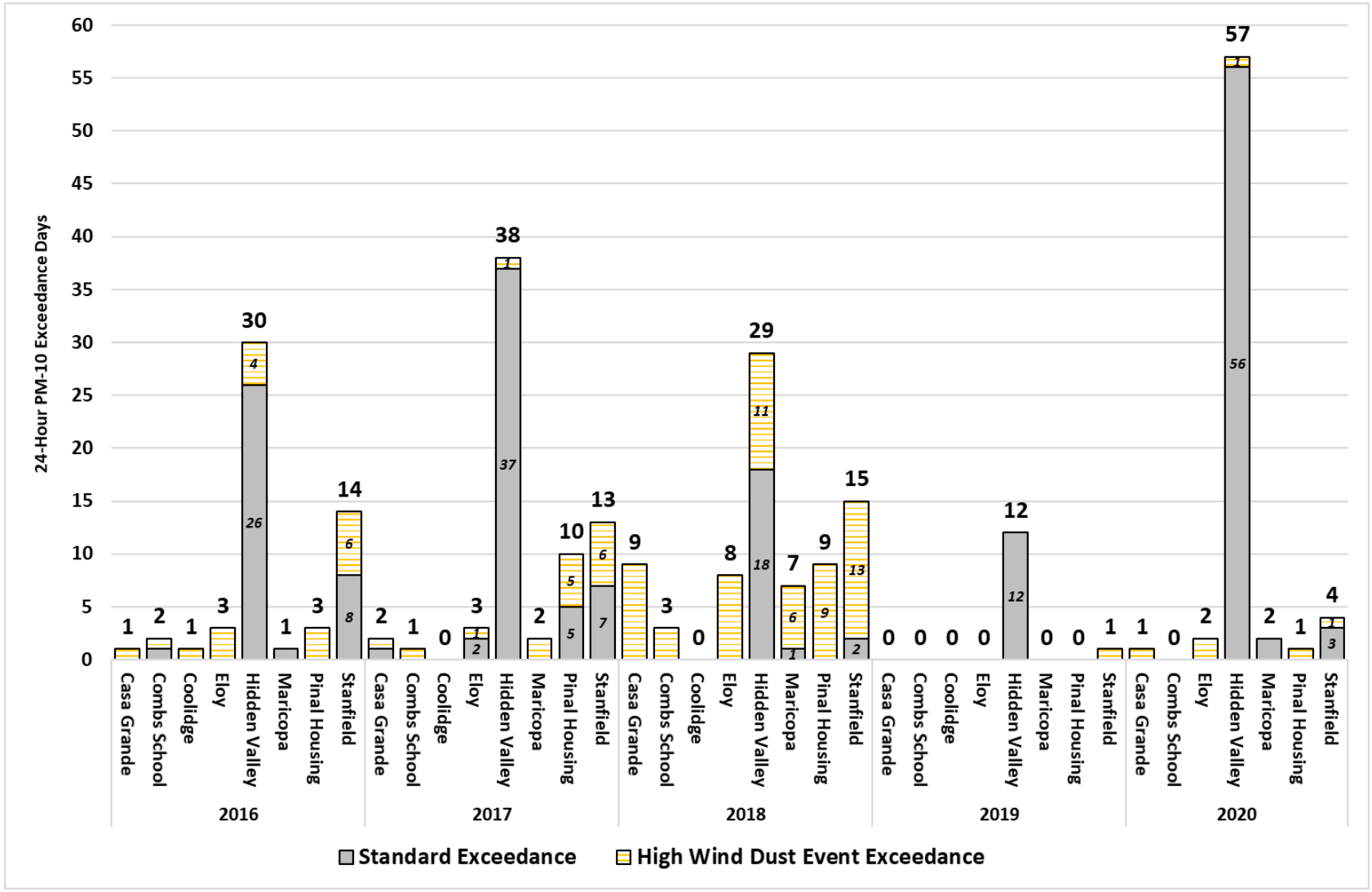


Figure ES-2
2017 Annual PM-10 Emissions in the West Pinal County PM-10 Nonattainment Area

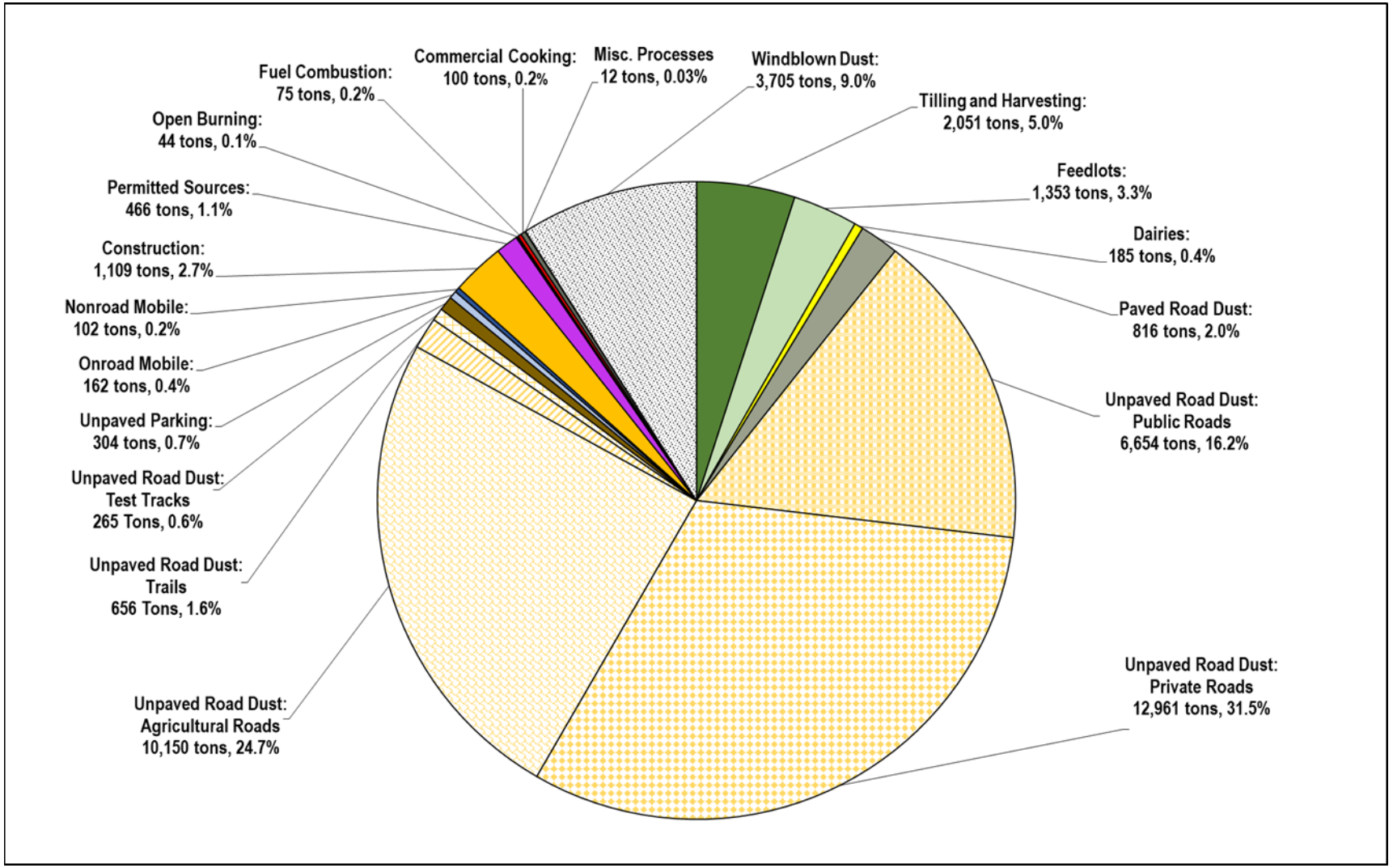
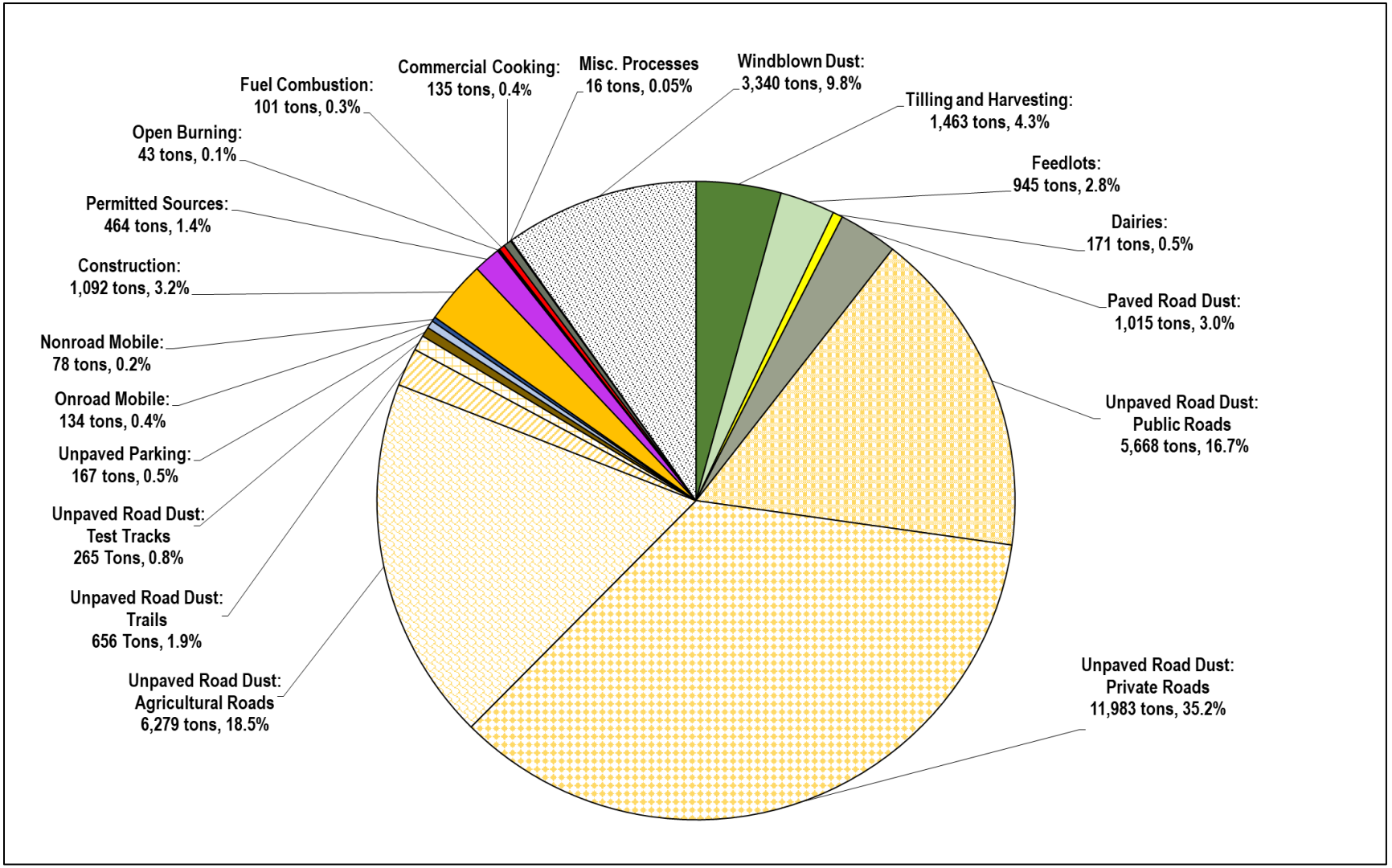


Figure ES-3
2026 Controlled Annual PM-10 Emissions in the West Pinal County PM-10 Nonattainment Area



For the attainment demonstration, a combination of AERMOD dispersion modeling and emissions rollback modeling was performed. The episodic modeling evaluated attainment across eight design days encompassing the three ambient monitors in the region where violations of the 24-hour PM-10 standard have been recorded. From this modeling, the peak 24-hour maximum PM-10 concentration was estimated to be less than the 150 $\mu g/m^3$ standard by 2026.

In accordance with the Clean Air Act, the 2022 Serious Area Particulate Plan for PM-10 also contains contingency measures. The contingency measures are committed measures in the adopted plan which achieve emissions reductions beyond those measures relied upon to model attainment of the standard and demonstrate progress toward attainment.

EPA guidance indicates that contingency measures should provide emissions reductions equivalent to one year of reasonable further progress. The reasonable further progress requirements for Serious PM-10 nonattainment areas are included in Section 189(c) of the Clean Air Act. For the 2022 Serious Area Particulate Plan for PM-10, one year of reasonable further progress is equivalent to a reduction in PM-10 emissions of 795 tons. The contingency measure included in the Plan is estimated to provide PM-10 emissions reductions of 951 tons in 2027, exceeding the target value of 795 tons.

For transportation conformity analyses, motor vehicle emissions budgets are established for the reasonable further progress milestone year of 2023 and the attainment year of 2026. The budgets include vehicle exhaust, tire wear and brake wear; road construction; re-entrained dust from vehicle travel on paved roads; and fugitive dust from vehicle travel on public and private (non-agricultural) unpaved roads. In 2023, the PM-10 emissions from these categories total 45,014 kilograms per day. And in 2026 the PM-10 emissions from these categories total 42,469 kilograms per day. This represents the motor vehicle emissions budgets for transportation conformity.

1. INTRODUCTION

Within the West Pinal County nonattainment area, the National Ambient Air Quality Standards (NAAQS) have not yet been attained for particulate matter less than or equal to 10 micrometers (known as PM-10). The Maricopa Association of Governments (MAG) was designated by the Governor of Arizona in 1978 and recertified by the Arizona Legislature in 1992 to serve as the Regional Air Quality Planning Agency to develop plans to address air pollution problem. On June 22, 2016, the Governor of Arizona transmitted a letter to the Environmental Protection Agency (EPA) to update the planning certifications. This plan was prepared through a coordinated effort with the Arizona Department of Environmental Quality (ADEQ), Arizona Department of Transportation (ADOT), Maricopa Association of Governments, Pinal County Air Quality Control District (PCAQCD) and the Sun Corridor Metropolitan Planning Organization (SCMPO).

On June 24, 2020, the Environmental Protection Agency published a final rule to determine that the West Pinal County Moderate PM-10 Nonattainment Area failed to attain the PM-10 standard by the December 31, 2018 attainment date and is reclassified as a Serious Area, effective July 24, 2020. The Serious Area attainment date is December 31, 2022.

The Clean Air Act requires that a Serious Area Particulate Plan for PM-10 be submitted within eighteen months of the reclassification effective date. The plan is required to include Best Available Control Measures that are designed to achieve the maximum degree of emissions reduction from a particulate source. The Best Available Control Measures are required to be implemented no later than four years after the reclassification effective date or by July 24, 2024. Also, the definition of major source is changed from 100 tons to 70 tons per year.

While the attainment date for Serious Areas is December 31, 2022, the Clean Air Act also allows the Environmental Protection Agency to extend the attainment date for up to five years if the following requirements are met:

- Attainment by December 31, 2022 is impracticable.
- Compliance with all requirements and commitments in the plan.
- Plan includes the Most Stringent Measures that are included in the plan of any State or are achieved in practice in any State, and can feasibly be implemented in the area.
- Attainment no later than December 31, 2027.

Consequently, the 2022 Serious Area Particulate Plan for PM-10 has been prepared to meet the requirements in the Clean Air Act and improve air quality in the nonattainment area. The following narrative describes the historical background preceding the preparation of the Serious Area PM-10 Plan.

HISTORICAL BACKGROUND

On May 31, 2012, the Environmental Protection Agency (EPA) designated the West Pinal County PM-10 Nonattainment Area as a Moderate Area, effective July 2, 2012. The Moderate Area attainment date was December 31, 2018. The Arizona Department of Environmental Quality (ADEQ) prepared the 2015 West Pinal Moderate PM-10 Nonattainment Area State Implementation Plan and submitted it to EPA on December 21, 2015.

EPA published a final rule on May 1, 2017 approving some of the rules and statutes concerning the regulation of PM-10 emissions from construction sites, some agricultural activities, and other fugitive dust sources in the West Pinal County nonattainment area. These rules and statutes were submitted to EPA on December 21, 2015 as part of the ADEQ 2015 West Pinal Moderate PM-10 Plan.

On June 24, 2020, EPA published a final rule to determine that the West Pinal County Moderate PM-10 Nonattainment Area failed to attain the PM-10 standard by the December 31, 2018 attainment date based upon complete, quality-assured and certified PM-10 monitoring data for the period of 2016-2018. As a result of the final determination of failure to attain the PM-10 standard, the West Pinal County nonattainment area is reclassified as a Serious Area, effective July 24, 2020. The Serious Area attainment date is December 31, 2022.

EPA proposed a partial approval and partial disapproval of the ADEQ 2015 West Pinal Moderate Plan on January 8, 2021. EPA proposed to approve the base year 2008 emissions inventory for direct PM-10 emissions, and proposed to disapprove the remaining elements of the plan including the attainment demonstration, reasonable further progress, reasonably available control measures, contingency measures, and motor vehicle emission budgets. Additionally, On February 26, 2021, EPA proposed a limited approval and limited disapproval of rules and statutes governing PM-10 emissions from some agricultural activities in the West Pinal County nonattainment area that were included in the ADEQ 2015 West Pinal Moderate Plan.

On May 17, 2021, ADEQ withdrew the 2015 West Pinal Moderate Plan and related unapproved rules from consideration for further action by EPA. Although the plan was withdrawn, the measures continue to be implemented to reduce PM-10.

As a result of the withdrawal of the ADEQ 2015 West Pinal Moderate Area Plan, EPA published a final rule on July 23, 2021 to make a Finding of Failure to Submit a State Implementation Plan for the West Pinal County Moderate PM-10 Nonattainment Area. The finding became effective on August 23, 2021. If a new complete plan is not submitted within 18 months of the finding, the Clean Air Act sanction of tighter controls on major industries (two to one offsets) would be imposed by February 23, 2023. If a complete plan is not submitted within 24 months of the finding, the federal highway sanction and a federal implementation plan would be imposed by August 23, 2023. The submittal of a

new plan and a completeness determination by EPA will stop the sanctions clocks. A plan approval action by EPA will stop the imposition of a federal plan.

OUTLINE OF THE 2022 SERIOUS AREA PARTICULATE PLAN FOR PM-10

The purpose of this document is to present the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area. The plan contains a wide variety of committed control measures to meet the Clean Air Act requirements for Best Available Control Measures and Most Stringent Measures. As provided for under the Clean Air Act, the plan includes a request for an extension of the attainment date until December 31, 2026. December 31, 2026 is the most expeditious date possible for demonstration of attainment of the PM-10 National Ambient Air Quality Standards in the West Pinal County nonattainment area.

The 2022 Serious Area Particulate Plan for PM-10 is composed of the following major sections:

1. Introduction (This Chapter) – Includes a general discussion of historical background and the outline of the 2022 Serious Area Particulate Plan for PM-10.

2. Description of the Nonattainment Area – Includes a description of the nonattainment area geography and climatic conditions.

3. Assessment of Air Quality Conditions – Includes a discussion of the formation of particulate pollution; PM-10 emissions inventory; evaluation of PM-10 precursors; air quality monitoring data and trend analysis; and a demonstration of the impracticability of attainment by December 31, 2022.

4. Evaluation of PM-10 Control Measures – Includes an overview of existing PM-10 control measures and analyses of candidate Best Available Control Measures and Most Stringent Measure.

5. Demonstration of Best Available Control Measures – Includes a discussion of pertinent definitions; procedures for determining Best Available Control Measures; and a demonstration that the requirements related to the selection of Best Available Control Measures have been met.

6. Suggested Measures for the Plan – Includes a discussion of the MAG Air Quality Technical Advisory Committee and Management Committee recommendations for the Suggested List of Measures; MAG Regional Council approval of the Suggested List of Measures; and the next steps that follow approval of the Suggested List of Measures.

7. The Adopted Plan – Includes a summary of the committed measures and implementation schedules; tracking plan implementation; and assurances that the State has the authority to implement the measures in the plan.

8. Attainment Demonstration – Includes a discussion of the evaluation of committed control measures, attainment date extension request, air quality modeling analysis; 2026 attainment demonstration; weight of evidence analyses; motor vehicle emissions budget for conformity; contingency measures; expeditious attainment; and reasonable further progress.

9. Request for Extension of the Attainment Date – Includes a demonstration of the impracticability of attainment by December 31, 2022; compliance with all requirements and commitments of the implementation plan; demonstration of inclusion of the Most Stringent Measures; and other extension request factors.

10. Public Participation – Includes a description of the MAG decision making structure; public participation in preparation of the plan; public involvement for transportation and air quality; and Title VI and Environmental Justice considerations.

11. Commitments for Implementation of the 2022 Serious Area Particulate Plan for PM-10 – Includes a description of the resolutions from local governments and implementing entities.

2. DESCRIPTION OF THE NONATTAINMENT AREA

The West Pinal County PM-10 nonattainment area was formally designated by EPA on May 31, 2012. As defined in the Clean Air Act, the term nonattainment area refers to locations which exceed any national ambient air quality standard for any pollutant based upon the data collected through air quality monitoring. A general description of the West Pinal County PM-10 nonattainment area, including a discussion of the boundaries of the area and the geography and climatic conditions is provided below.

NONATTAINMENT AREA BOUNDARIES

The West Pinal County PM-10 nonattainment area is located in the western portion of Pinal County, Arizona and encompasses 1,325 square miles. According to May 31, 2012 Federal Register notice designating the nonattainment area, EPA describes the boundaries of the nonattainment as such: "With the exception of Indian country and certain Federal lands, the EPA's nonattainment area boundaries generally encompass the land geographically located within Pinal County north of the east-west line defined by the southern line of Township 9 South, Gila and Salt River Baseline and Meridian, and west of the north-south line defined by the eastern line of Range 8 East, except where the boundary extends farther east in the Florence and Picacho Peak areas."

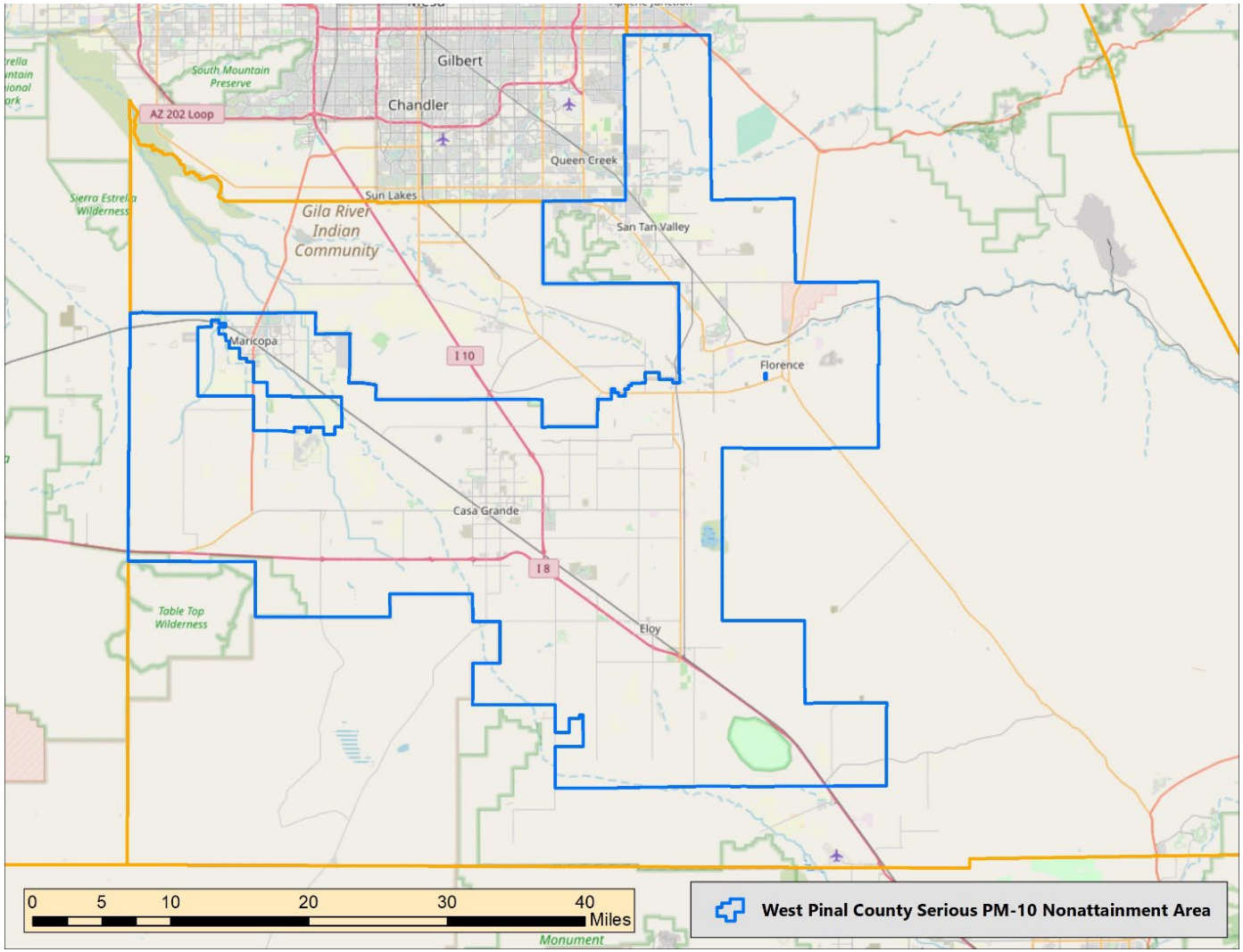
GEOGRAPHY AND CLIMATIC CONDITIONS

The West Pinal County PM-10 nonattainment area is located in the western portion of Pinal County, lying within a basin characterized by low desert valleys between the Phoenix and Tucson metropolitan areas. The central city of Casa Grande provides a typical nonattainment area elevation of 1,403 feet. Directly east of the nonattainment area, Pinal County becomes mountainous, with elevations up to 6,441 feet.

The nonattainment area contains all, or portions of the incorporated cities and towns of Apache Junction, Casa Grande, Coolidge, Eloy, Florence, Queen Creek and Maricopa. According to data based upon the July 1, 2017 U.S. Census Bureau Annual Estimates of the Resident Population and other Pinal County-specific socioeconomic data, the 2017 population of the nonattainment area is 343,788.

The climate with regard to precipitation within the nonattainment area is arid. Annual average precipitation is 7.91 inches. River beds and washes throughout the nonattainment area are generally dry, except during torrential rainfall, which happens infrequently. Average seasonal maximum temperatures at the centrally located city of Casa Grande range from 69.6 degrees Fahrenheit in the winter to 106.0 degrees Fahrenheit in the summer according to 1991-2020 U.S. Climate Normals. A map of the West Pinal County PM-10 nonattainment area is shown in Figure 2-1

Figure 2-1
Map of the West Pinal County PM-10 Nonattainment Area



3. ASSESSMENT OF AIR QUALITY CONDITIONS

Within the West Pinal County nonattainment area, PM-10 particulate pollution is a problem throughout the year. Particulate pollution is composed of solid particles or liquid droplets which are small enough to remain suspended in the air. The smaller the size, the more likely the particles are to reach the innermost portions of the lungs and cause damage. Major concerns for human health from exposure to particle pollution include: increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; decreased lung function; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. The elderly, children, and people with heart and lung disease are especially sensitive to the effects of particulate matter. Particles that are 2.5 micrometers in diameter and smaller (PM-2.5) can lodge deep in the lungs and are believed to be the largest health risk.

In order to effectively reduce PM-10, it is important to assess air quality conditions in the West Pinal County PM-10 nonattainment area. This chapter presents a discussion of PM-10 formation, the evaluation of PM-10 precursors, the 2017 base year PM-10 emissions inventory, air quality monitoring data, and a demonstration of the impracticability of attaining the PM-10 by 2022.

FORMATION OF PM-10 PARTICULATE POLLUTION

Particulate matter, or particle pollution, is a complex mixture of small particles and liquid droplets found in the air. Particulate matter (PM) can be directly emitted by a source, or it can also be formed in the atmosphere when gaseous pollutants such as sulfur dioxides and nitrogen dioxides react to form fine particles.

PM-10 is defined as that portion of particulate matter with an aerodynamic diameter less than or equal to ten micrometers. The subset of PM-10 that is larger than 2.5 micrometers, referred to as coarse particles, do not remain airborne as long as smaller particulate matter and their spatial impact is typically limited because they tend to deposit on the ground downwind of emissions sources. Larger coarse particles are not readily transported across urban or broader areas because they are generally too large to remain suspended in air and they tend to be removed easily on contact with surfaces.

The formation of PM-10 particulate pollution in the West Pinal County nonattainment area is dependent upon several factors. Among these factors are meteorological factors such as stagnant air masses, temperature inversions, and high winds from thunderstorms and frontal systems. The fine, dry and silty soils characteristic of desert locations, including the West Pinal County nonattainment area, promote the direct entrainment and suspension of PM-10, especially from recently disturbed surfaces. In the nonattainment area, high PM-10 concentrations occur throughout the year and generally occur on days with dry, stagnant conditions, and on days with high winds from thunderstorm outflows or passing frontal systems.

The PM-10 pollution in the arid Southwest, including the West Pinal County nonattainment area, largely consists of coarse particles (i.e., aerodynamic diameter greater than 2.5 microns but less than or equal to 10 microns) which are typically crustal in nature and derive mainly from windblown dust, reentrained road dust (from paved, unpaved roads and parking lots), construction, and agricultural activities (e.g., tilling and harvesting, animal operations, and travel on unpaved farm roads). Other secondary components of particulate matter, such as ammonia, sulfates, nitrates, volatile organic compounds, and elemental/organic carbon are typically found in the fine fraction of particulate matter (i.e., aerodynamic diameter less than or equal to 2.5 microns), and are most often the product of combustion activities (e.g., vehicle exhaust and fires). As discussed below, these secondary precursors to PM-10 formation have been found to be insignificant contributors to exceedances of the PM-10 standard in the West Pinal County nonattainment area. Within the West Pinal County nonattainment area, it is the direct, primary emission of PM-10 that leads to exceedances.

EVALUATION OF PM-10 PRECURSORS

The Environmental Protection Agency (EPA) has identified four precursor pollutants that contribute to the formation of particulate matter (PM): ammonia (NH3), nitrogen oxides (NOx), sulfur dioxide (SO2) and volatile organic compounds (VOC). As opposed to the primary or direct emission of particulate matter, the four precursors are involved in the secondary formation of particulate matter, where the gas-phase of the four precursors undergo chemical reactions in the atmosphere to form particulate matter.

EPA has required that a state implementation plan for the West Pinal County PM-10 nonattainment area address the role of precursors in contributing to PM-10 exceedances in the nonattainment area. EPA has stated that “a state must include direct PM emissions and these four precursors in emissions inventories and must control emissions from sources of all of these pollutants, unless the state demonstrates to EPA’s satisfaction that control of one or more of these pollutants is not needed for expeditious attainment of the NAAQS in the nonattainment area at issue.” (86 FR 1347)

As there is no published EPA guidance for demonstrating the significance of precursors on PM-10 formation, a weight of evidence report was prepared that provides a demonstration that the four particulate matter precursors identified by EPA do not significantly contribute to PM-10 exceedances in the West Pinal County PM-10 nonattainment area. The full report is available as an appendix to the 2017 Base Year PM-10 Emissions Inventory for the West Pinal County Serious PM-10 Nonattainment Area (Appendix A, Exhibit 1).

The weight of evidence demonstration within the report includes analysis of three data sources: (1) Co-located PM-2.5/PM-10 ratios and concentrations on PM-10 exceedance days in the nonattainment area; (2) Chemical characterization of coarse and fine fraction particulate matter in the nonattainment area on PM-10 exceedance days; and (3) Photochemical modeling of the impact of the precursors on PM-2.5 concentrations in the

nonattainment area. All three data sources indicate that it is unlikely that precursor emissions significantly contribute to the PM-10 exceedances in the West Pinal County PM-10 nonattainment area. In summary, analyses of the data sources find that:

(1) The co-located PM-2.5/PM-10 ratios are indicative of fugitive dust sources. The co-located PM-2.5 and PM-10 concentrations also vary significantly between the two monitored locations, indicating the dominant role of localized sources of PM-10 – as opposed to the secondary formation of PM-10, which is more regional in nature.

(2) An examination of the measured ammonium, nitrate and sulfate concentrations on PM-10 exceedance days finds that the concentrations do not exceed the PM-2.5 contribution threshold (1.5 micrograms per cubic meter) established by EPA guidance in the fine fraction. Total fine and coarse fractions also do not exceed an EPA suggested PM-10 threshold of 5 micrograms per cubic meter. This suggests that the precursor pollutants of ammonia, nitrogen dioxide, and sulfur dioxide also do not significantly contribute to PM-10 exceedances. Organic matter concentrations in both the coarse and fine fractions on the exceedance days were largely found to be the result of direct primary emissions of organic matter from the resuspension of organic matter in local soils, making it unlikely that secondary organic aerosols (formed from VOCs) contribute significantly to PM-10 exceedances.

(3) Following EPA guidance (PM-2.5 Precursor Demonstration Guidance, May 2019), photochemical modeling using the Comprehensive Air Quality Model with Extensions (CAMx) and the 2017 National Emissions Inventory was performed to determine the impact of precursors on the formation of PM-2.5 in the West Pinal County PM-10 nonattainment area. The modeling found that all four precursors were found to be insignificant to the formation of PM-2.5 (all four precursors were below the contribution threshold of 1.5 micrograms per cubic meter). Given that the vast majority of secondary particulate formation occurs in the fine fraction of PM-10, it is highly unlikely that secondary particulate formation would be insignificant for PM-2.5, but significant for PM-10.

Taken as a whole, the analyses of the three datasets provides sufficient weight of evidence to conclude that precursors do not contribute significantly to PM-10 exceedances in the West Pinal County PM-10 nonattainment area. Since precursors have been found to be insignificant, control of precursor emissions will not expedite attainment of the PM-10 standard in the West Pinal County PM-10 nonattainment area. Based upon the results of the weight of evidence demonstration regarding precursors, PM-10 emission inventories for the West Pinal County nonattainment area only include direct, primary emissions of PM-10.

BASELINE PM-10 EMISSIONS INVENTORY

The Clean Air Act requires a comprehensive, accurate and current inventory of actual emissions from all sources within the nonattainment area. The 2017 Base Year PM-10 Emissions Inventory for the West Pinal County Serious PM-10 Nonattainment Area contains the descriptions, methodologies, and calculations used to develop the 2017 base year annual and average daily PM-10 emissions inventory for the West Pinal County Serious PM-10 nonattainment area. (Appendix A, Exhibit 1). The inventory was developed through a collaborative effort with the Arizona Department of Environmental Quality (ADEQ), Pinal County Air Quality Control District (PCAQCD), and the Maricopa Association of Governments (MAG).

As explained in the prior section of this Chapter, the 2017 Base Year PM-10 Emissions Inventory includes only direct, primary emissions of PM-10, as PM-10 emissions in the nonattainment area are dominated by fugitive dust sources. Secondary formation of PM-10 through precursor emissions of ammonia, nitrogen oxides, sulfur dioxide, and volatile organic compounds have been determined to be insignificant in the nonattainment area

The Environmental Protection Agency recommended selecting a base year between the years of 2016-2018 for the baseline PM-10 emissions inventory for the West Pinal County Serious PM-10 nonattainment area as monitoring data from those years was used to reclassify the nonattainment area from a Moderate Area to a Serious Area. 2017 was chosen as the base year as emissions activity data and estimates for many PM-10 sources in Pinal County had already been developed to meet 2017 National Emissions Inventory requirements.

Where applicable, 2017 base year PM-10 emissions within the West Pinal County Serious PM-10 nonattainment area reflect the implementation of PM-10 control measures included in the Arizona Department of Environmental Quality 2015 West Pinal Moderate PM-10 Nonattainment Area State Implementation Plan. While the ADEQ 2015 West Pinal Moderate PM-10 Plan submittal has been officially withdrawn by ADEQ, the Moderate area controls included in the Plan remain in place and continue to be implemented within the nonattainment area.

PM-10 emissions sources included in the 2017 Base Year PM-10 Emissions Inventory are organized by point sources (permitted sources), nonpoint sources (area sources), nonroad mobile sources, and onroad mobile sources. The point source category includes PM-10 emissions from stationary sources (power plants, manufacturing facilities, industrial processes, etc.) that have been issued operating permits by the Pinal County Air Quality Control District. All of the permitted facilities within the West Pinal County Serious PM-10 nonattainment area are considered minor sources of PM-10. There are no major, stationary sources of PM-10 within the nonattainment area (in a Serious PM-10 nonattainment area, major sources of PM-10 are defined as sources that emit 70 tons of PM-10 or more per year).

Nonpoint, or area sources, are sources which are generally too small or too numerous to be treated as individual point sources. Nonpoint source categories within the West Pinal County Serious PM-10 nonattainment area have been previously identified as part of the 2008 base year PM-10 emissions inventory included in the Arizona Department of Environmental Quality 2015 West Pinal Moderate PM-10 Nonattainment Area State Implementation Plan. The 2017 National Emissions Inventory (NEI) for Pinal County was also reviewed to ensure all significant nonpoint sources of PM-10 were included in this 2017 base year emissions inventory.

Nonroad mobile sources are vehicles or equipment that move (or are moved) within the 12-month period and are not licensed or certified as highway vehicles. Nonroad vehicles and equipment fall into the categories such as agricultural equipment (e.g., tractors), commercial and industrial equipment (e.g., forklifts), construction equipment (e.g., backhoes), law and garden equipment (e.g., lawn mowers), personal boats and recreational equipment (e.g., ATVs), aircraft and locomotives. Onroad mobile source emissions include PM-10 emissions from three main categories: (1) exhaust, break wear and tire wear from onroad vehicle travel; (2) paved road fugitive dust; and (3) unpaved road fugitive dust.

Collectively these source categories are estimated to have contributed annual PM-10 emissions of 41,168 tons and daily average PM-10 emissions of 242,332 pounds in calendar year 2017 within the West Pinal County nonattainment area. A complete description of the sources and the corresponding methodology used to calculate the 2017 PM-10 emissions are included in the 2017 Base Year PM-10 Emissions Inventory for the West Pinal County Serious PM-10 Nonattainment Area (appendix A, Exhibit 1). Table 3-1 includes a summary table of annual and daily average 2017 PM-10 emissions in the West Pinal County nonattainment area. Controlled 2026 attainment year emissions for the nonattainment area are included in Chapter Eight.

The 2017 baseline emissions inventory for the nonattainment area indicates that on an annual basis unpaved roads account for approximately 75% of annual PM-10 emissions. Windblown dust from a variety of land uses account for approximately 9% of annual PM-10 emissions, followed by agricultural tilling and harvesting at 5%, feedlots and dairies at 4%, construction at 3%, and fugitive dust from paved roads at 2%. A variety of other combustion and fugitive dust sources individually contribute less than 2% of annual PM-10 emissions. Figure 3-1 displays a pie chart of annual 2017 PM-10 emissions in the nonattainment area. Figure 3-2 displays a pie chart of daily average 2017 PM-10 emissions in the nonattainment area.

Table 3-1
2017 Annual and Daily Average PM-10 Emissions
in the West Pinal County Nonattainment Area

Source Category	Annual PM-10 Emissions (tons/year)	Daily PM-10 Emissions (lbs/year)
Point Sources		
Permitted Sources	466	2,552
Nonpoint Sources		
Harvesting and Tilling	2,051	25,220
Concentrated Animal Feeding Operations (CAFOs)	1,353	7,416
Dairies	185	1,011
Construction	1,109	8,398
Commercial Cooking	100	545
Fuel Combustion	75	696
Miscellaneous Non-Industrial Processes	12	65
Open Burning	44	357
Unpaved Parking	304	1,659
Windblown Dust	3,705	20,302
Nonroad Mobile Sources		
Nonroad Mobile Sources	102	616
Onroad Mobile Sources		
Onroad Mobile Sources (exhaust, brake/tire wear)	162	882
Paved Road Dust	816	4,473
Unpaved Road Dust - Agricultural Roads	10,150	55,616
Unpaved Road Dust - Private Roads	12,961	71,018
Unpaved Road Dust - Public Roads	6,654	36,460
Unpaved Road Dust - Trails	656	3,597
Unpaved Road Dust - Test Tracks	265	1,447
Total	**41,168**	**242,332**

Figure 3-1
2017 Annual PM-10 Emissions in the West Pinal County PM-10 Nonattainment Area

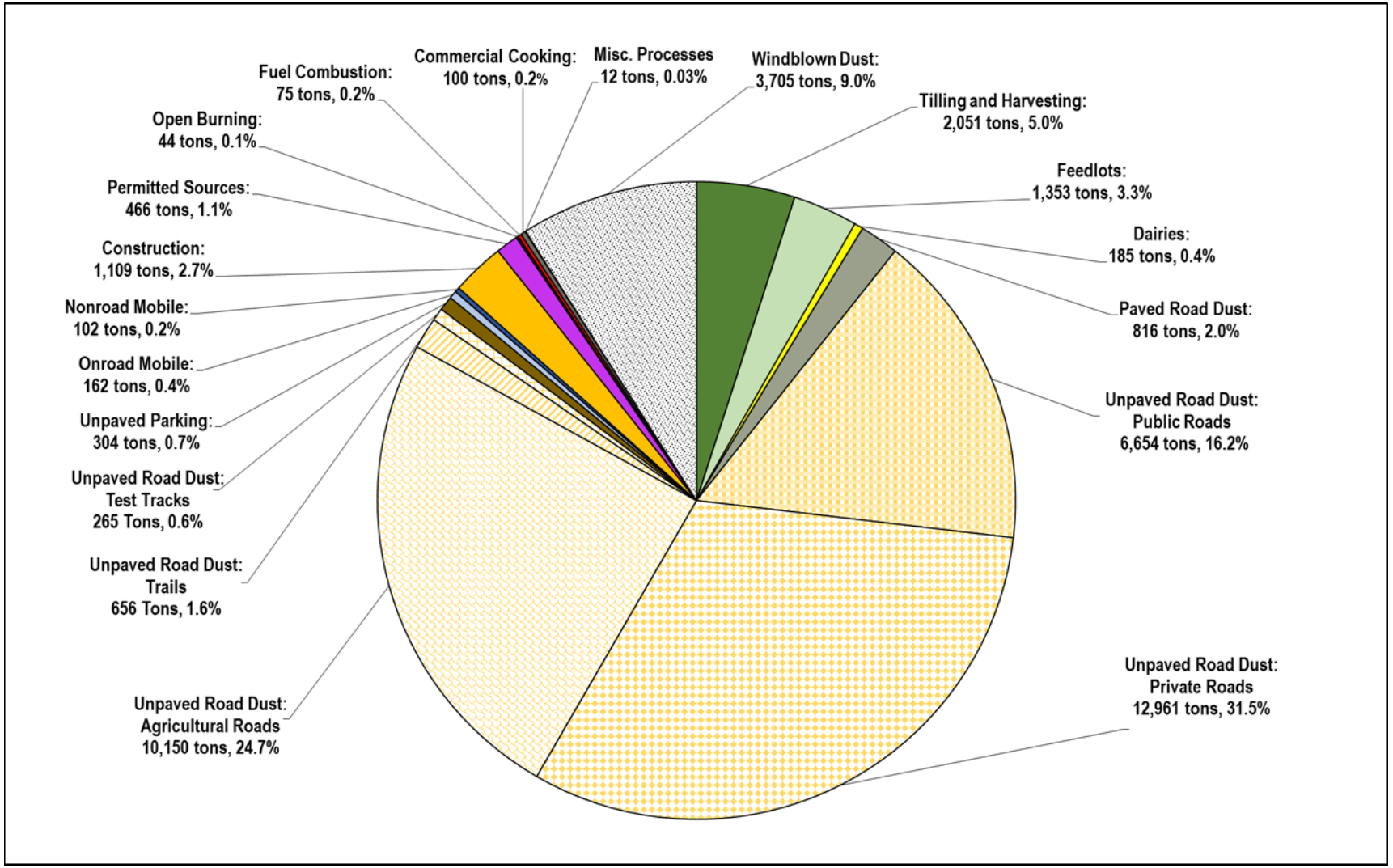
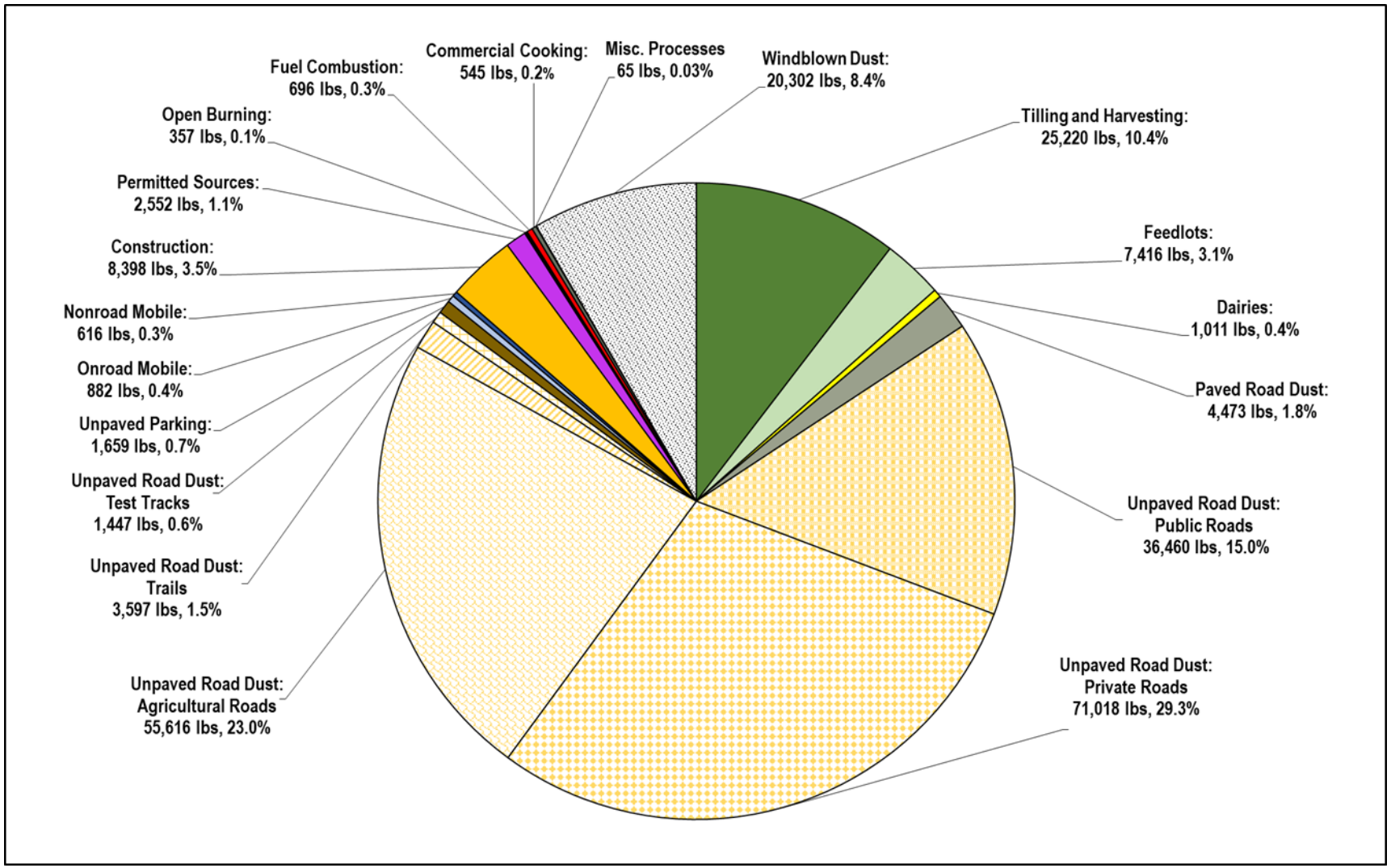


Figure 3-2
2017 Daily Average PM-10 Emissions in the West Pinal County PM-10 Nonattainment Area



AIR QUALITY MONITORING DATA AND TREND ANALYSIS

In addition to identifying sources of PM-10 emissions, it is important to examine the impact of these emissions on the ambient concentrations. This section includes discussions of the National Ambient Air Quality Standards (NAAQS) for PM-10 and the air quality data recorded by the areawide monitoring network.

The 24-hour PM-10 standard is 150 micrograms per cubic meter ($\mu g/m^3$). The standard is attained when the expected number of exceedances per year at each monitoring site is less than or equal to one. The number of expected exceedances at a site is determined by recording the number of exceedances in each calendar year and then averaging them over the past three years. At some sites, PM-10 sampling is scheduled less frequently than every day. To account for this, an adjustment must be made to the data collected at each site to estimate the number of exceedances in a calendar year. Due to possible seasonal imbalance, the adjustment is made quarterly. The estimate of the expected number of exceedances for the quarter is equal to the observed number of exceedances plus an increment associated with the missing data. The expected number of exceedances is then estimated by averaging the annual estimates over the three-year period. Due to the rounding criteria used by EPA, a recorded average PM-10 concentration must be under 155 $\mu g/m^3$ to not be considered an exceedance and the three-year expected exceedance rate for any site must be less than 1.05 for the region to be in attainment of the 24-hour standard. The annual PM-10 standard of 50 $\mu g/m^3$ was revoked by EPA effective December 18, 2006.

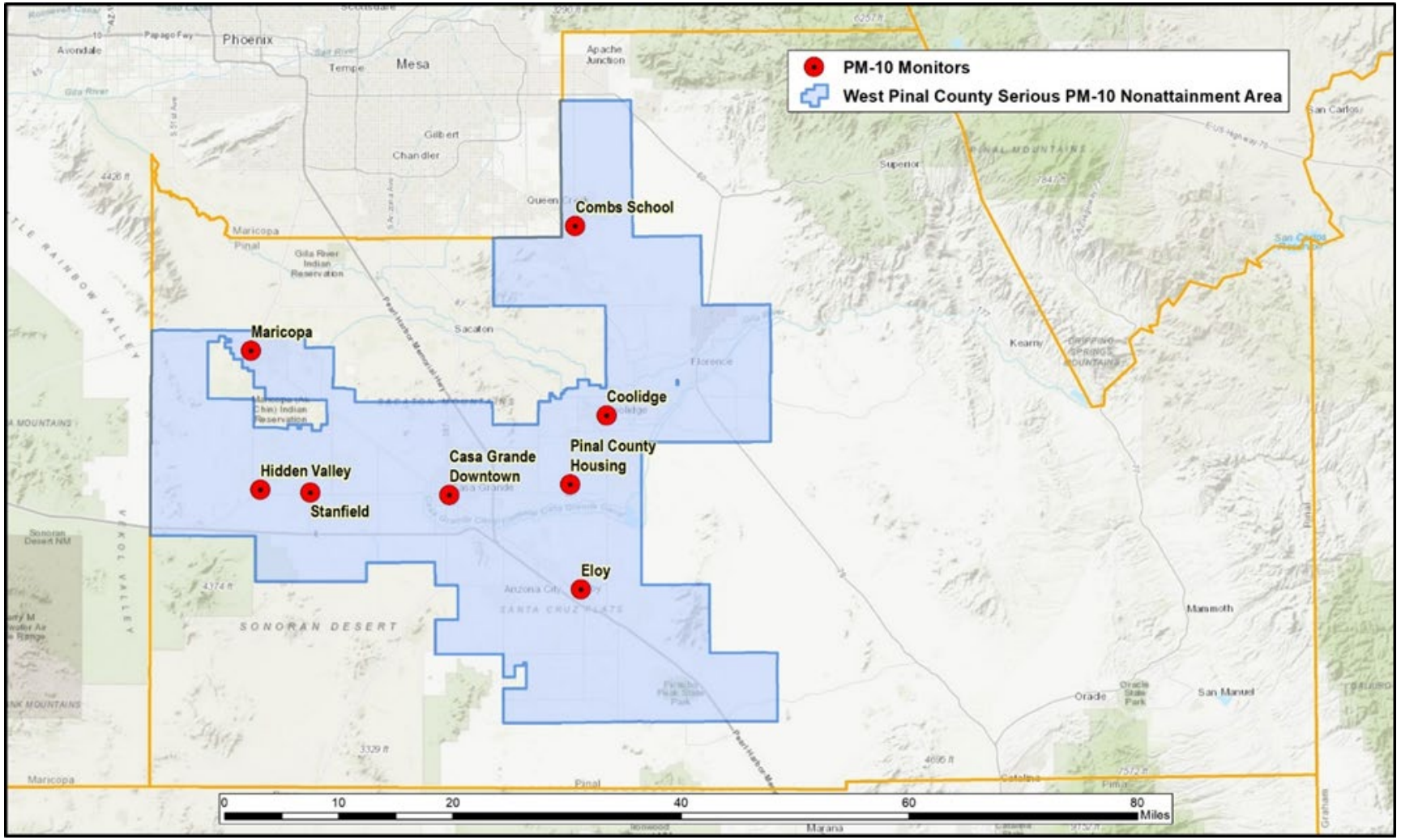
In order to determine the extent of the regional PM-10 pollution problem, it is necessary to examine the air quality data collected by the monitoring network. A total of eight PM-10 monitoring stations are located with the West Pinal County PM-10 nonattainment area All eight stations are operated by the Pinal County Air Quality Control District, with all sites but one (Coolidge) operating on a continuous basis. Site-specific information regarding the PM-10 monitoring stations is provided in Table 3-2, and a map displaying the geographic location of the PM-10 monitoring stations is provided in Figure 3-3.

Table 3-2
PM-10 Monitoring Stations within the West Pinal County Nonattainment Area

AQS ID	Station Name	Station Address
04-021-0001	Casa Grande Downtown	401 Marshall St., Casa Grande
04-021-3009	Combs School	301 E Combs Rd., Queen Creek
04-021-3004	Coolidge	212 E. Broadway, Coolidge
04-021-3014	Eloy Complex	801 N Main St., Eloy
04-021-3015	Hidden Valley	43750 W Carefree Place, Maricopa
04-021-3016	City of Maricopa Complex	19955 N Wilson Ave., Maricopa
04-021-3011	Pinal County Housing	970 N Eleven Mile Corner Rd., Case Grande
04-021-3008	Stanfield Complex	36697 W Papago Dr., Stanfield

Note: The Coolidge monitor was discontinued effective December 31, 2019.

Figure 3-3
Map of PM-10 Monitoring Stations within the West Pinal County PM-10 Nonattainment Area



One method of assessing the overall extent of PM-10 pollution in the West Pinal County nonattainment area is to examine the PM-10 concentration data measured at each monitoring station. As PM-10 monitoring data from 2016-2018 was used by EPA to reclassify the nonattainment area from a Moderate Area to a Serious Area, data from 2016-2018 is used as the starting point for examining the extent of PM-10 pollution in the nonattainment area. Data from 2019-2020 is included to provide insight into PM-10 concentration trends within the nonattainment area.

The number of 24-hour PM-10 exceedance days by air quality monitoring station in 2016-2020 is shown in Figure 3-4. For each monitoring station, the number of 24-hour PM-10 exceedance days in each year is divided into two categories of exceedances: Standard exceedances and High Wind Dust Event (HWDE) exceedances. For purposes of classification, standard exceedances are exceedances that do not qualify as a High Wind Dust Event. A HWDE exceedance is an exceedance that occurs when sustained wind speeds at the exceeding monitor, or in the source region of the exceedance event, are at or above 25 miles per hour. In general, exceedances caused by HWDE are considered uncontrollable, and the HWDE exceedances are candidates for exclusion from use in comparison to the PM-10 standard under the EPA Exceptional Events rule. To date, none of the HWDE in Figure 3-4 have been officially concurred upon by EPA as exceptional events and all 2016-2020 exceedances are currently eligible for comparison against the PM-10 standard. Tables 3-3 through 3-10 provide additional information on each exceedance day in 2016-2020 by monitoring station. Data in the tables include the exceedance date, the 24-hour PM-10 concentration, and whether the exceedance is a HWDE.

The data in Figure 3-4 indicates that the spatial distribution of PM-10 exceedance days is not uniform across the nonattainment area. This is not unexpected. As discussed above, the PM-10 pollution problem in the West Pinal County nonattainment area is caused by the coarse fraction of PM-10. The coarse fraction of PM-10 tends to fall out quickly from the air after suspension and does not readily transport across the nonattainment area. As such, standard exceedances are local in nature, and the PM-10 emission sources nearest the monitoring station (generally within 2 miles) are the greatest contributor to PM-10 exceedances. The exception to this general rule is during HWDE, when extreme wind speeds can keep coarse fraction PM-10 suspended longer and one HWDE has the potential to cause exceedances at multiple monitoring stations.

As compared to 2016-2018, trend data from 2019-2020 show a marked decrease in PM-10 exceedances at all monitoring sites except for the Hidden Valley monitoring site. If HWDE are removed from consideration, all monitoring stations except for Hidden Valley and Stanfield may be attaining the PM-10 standard based upon 2018-2020 data (i.e., there are no more than three standard exceedance days in 2018-2020 at the monitoring sites). Overall, PM-10 pollution data in Figure 3-4 and Tables 3-3 through 3-10 indicate that while there is a general downward trend in the number of PM-10 exceedance days and the magnitude of PM-10 exceedance day concentrations in the West Pinal County nonattainment area, the nonattainment area has not yet attained the PM-10 standard.

Figure 3-4
2016-2020 24-Hour PM-10 Exceedance Days by Monitor in the West Pinal County Nonattainment Area

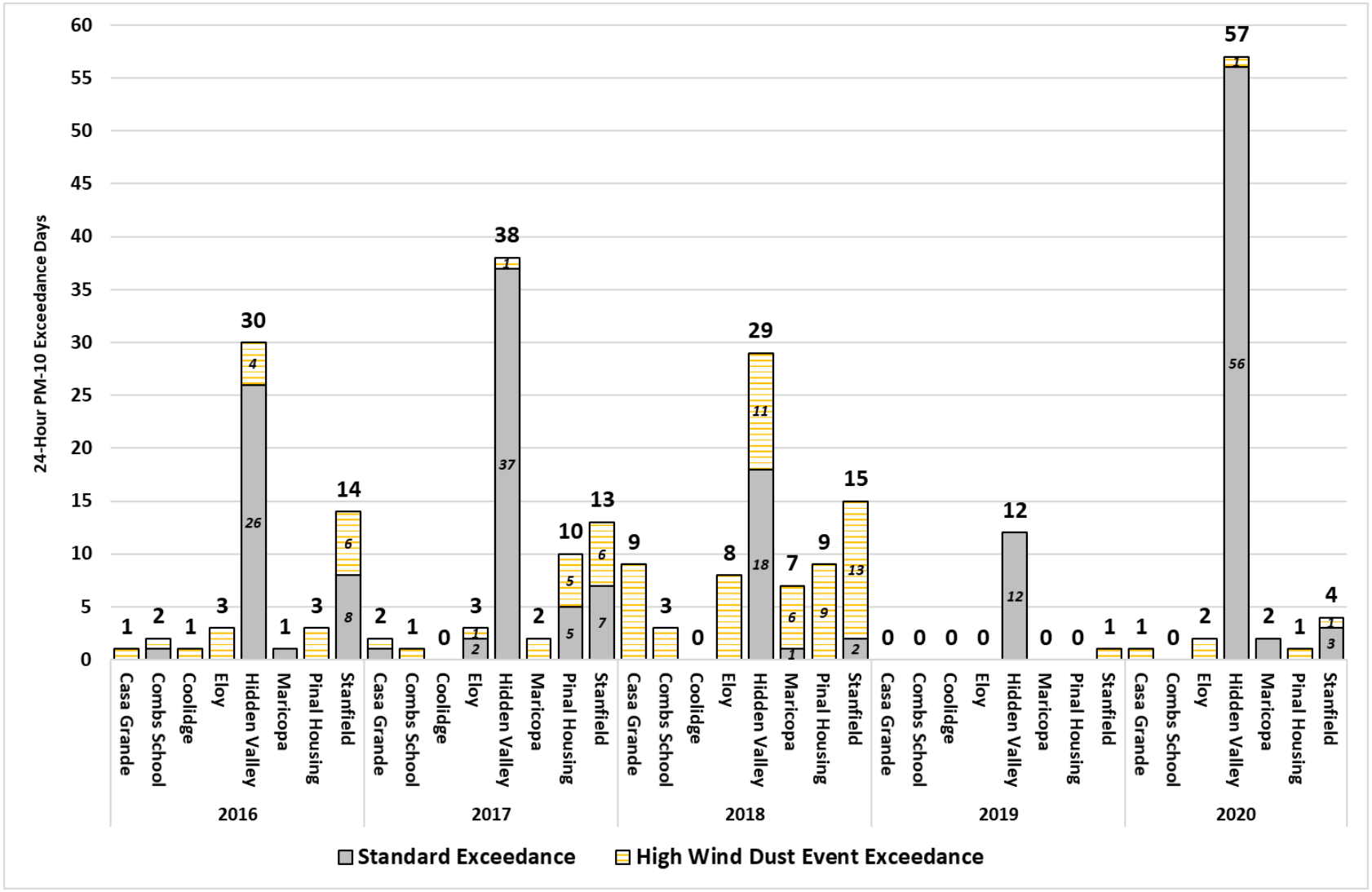


Table 3-3
2016-2020 PM-10 Exceedances by Date and Type at the Casa Grande Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
1/31	156	HWDE	7/15	226	HWDE	1/9	181	HWDE	None			11/7	219	HWDE
			10/21	160	Stnd.	4/12	451	HWDE						
						5/11	275	HWDE						
						7/5	299	HWDE						
						7/8	227	HWDE						
						8/2	331	HWDE						
						8/7	165	HWDE						
						8/9	253	HWDE						
						8/22	177	HWDE						

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.

Table 3-4
2016-2020 PM-10 Exceedances by Date and Type at the Combs School Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
3/22	236	Stnd.	9/7	177	HWDE	4/12	365	HWDE	None			None		
8/9	196	HWDE				4/19	160	HWDE						
						5/11	234	HWDE						

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.

Table 3-5
2016-2020 PM-10 Exceedances by Date and Type at the Coolidge Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
7/29	222	HWDE	None			None			None			N/A - Discontinued		
7/29	224	HWDE												

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.
The Coolidge monitor is a filter monitoring operating on a 1-in-6 day schedule.
On July 29, 2016, two filter samples were operating resulting in two monitored exceedances on the same day.

Table 3-6
2016-2020 PM-10 Exceedances by Date and Type at the Eloy Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
1/31	219	HWDE	9/7	168	HWDE	2/19	166	HWDE	None			8/16	1228	HWDE
7/29	328	HWDE	10/21	159	Stnd.	4/12	355	HWDE				11/7	624	HWDE
7/29	454	HWDE	11/30	165	Stnd.	4/19	180	HWDE						
						5/11	314	HWDE						
						7/8	182	HWDE						
						7/9	195	HWDE						
						8/8	172	HWDE						
						8/9	164	HWDE						

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.

Table 3-7
2016-2020 PM-10 Exceedances by Date and Type at the City of Maricopa Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
4/7	171	Stnd.	5/6	156	HWDE	1/9	164	HWDE	None			8/17	249	Stnd.
			9/7	232	HWDE	4/19	169	HWDE				10/26	269	Stnd.
						7/30	196	Stnd.				11/7	263	HWDE
						8/7	243	HWDE						
						8/8	658	HWDE						
						8/10	226	HWDE						
						8/12	348	HWDE						

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.

Table 3-8
2016-2020 PM-10 Exceedances by Date and Type at the Pinal County Housing Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
7/22	226	HWDE	5/6	206	HWDE	1/9	266	HWDE	None			11/7	209	HWDE
7/29	665	HWDE	5/30	179	Stnd.	2/19	189	HWDE						
12/24	259	HWDE	7/14	232	HWDE	4/12	780	HWDE						
			7/15	476	HWDE	4/19	205	HWDE						
			8/10	194	Stnd.	5/11	374	HWDE						
			9/7	416	HWDE	7/5	398	HWDE						
			9/14	190	HWDE	7/8	516	HWDE						
			10/21	205	Stnd.	8/2	403	HWDE						
			11/28	162	Stnd.	8/9	181	HWDE						
			12/1	185	Stnd.									

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.

Table 3-9
2016-2020 PM-10 Exceedances by Date and Type at the Stanfield Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
1/31	235	HWDE	4/28	205	HWDE	1/9	344	HWDE	4/10	183	HWDE	8/11	158	Stnd.
4/7	171	Stnd.	5/6	294	HWDE	2/19	417	HWDE				10/26	181	Stnd.
6/3	207	Stnd.	7/7	158	Stnd.	4/12	1100	HWDE				11/7	205	HWDE
6/4	169	Stnd.	7/15	328	HWDE	4/19	829	HWDE				11/22	164	Stnd.
6/18	171	Stnd.	8/4	213	HWDE	5/11	386	HWDE						
6/23	210	Stnd.	8/10	210	Stnd.	7/5	631	HWDE						
6/30	243	HWDE	8/28	172	Stnd.	7/6	193	Stnd.						
7/16	209	Stnd.	9/7	308	HWDE	7/8	664	HWDE						
7/23	164	Stnd.	9/14	283	HWDE	7/9	607	HWDE						
7/29	410	HWDE	10/15	158	Stnd.	8/1	184	Stnd.						
8/16	268	HWDE	10/21	161	Stnd.	8/7	304	HWDE						
8/19	209	Stnd.	11/29	158	Stnd.	8/8	217	HWDE						
9/26	285	HWDE	12/10	265	Stnd.	8/9	355	HWDE						
12/17	265	HWDE				8/10	197	HWDE						
						8/12	293	HWDE						

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.

Table 3-10
2016-2020 PM-10 Exceedances by Date and Type at the Hidden Valley Monitor

2016			2017			2018			2019			2020		
Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type	Date	PM-10 (µg/m^3)	Type
3/17	168	Stnd.	4/13	163	Stnd.	2/2	163	Stnd.	5/30	208	Stnd.	5/6	196	Stnd.
3/25	159	Stnd.	4/20	175	Stnd.	3/30	174	Stnd.	6/12	172	Stnd.	5/26	176	Stnd.
4/7	206	Stnd.	5/1	187	Stnd.	3/31	159	Stnd.	6/15	172	Stnd.	5/30	186	Stnd.
5/17	160	Stnd.	5/3	155	Stnd.	4/12	244	HWDE	6/24	178	Stnd.	6/3	169	Stnd.
6/6	252	Stnd.	6/7	217	Stnd.	4/19	160	HWDE	6/28	203	Stnd.	6/10	213	Stnd.
6/8	200	Stnd.	6/14	193	Stnd.	4/23	180	Stnd.	10/22	157	Stnd.	6/13	159	Stnd.
6/17	182	Stnd.	6/15	251	Stnd.	5/9	184	Stnd.	10/23	168	Stnd.	6/25	168	Stnd.
6/23	188	Stnd.	6/20	174	Stnd.	5/11	276	HWDE	10/25	179	Stnd.	6/26	190	Stnd.
6/24	169	Stnd.	6/26	174	Stnd.	5/16	163	Stnd.	11/4	222	Stnd.	7/2	200	Stnd.
6/27	187	Stnd.	6/30	200	Stnd.	6/2	165	Stnd.	11/5	239	Stnd.	7/15	161	Stnd.
6/28	174	Stnd.	7/7	225	Stnd.	6/4	220	Stnd.	11/12	164	Stnd.	7/16	220	Stnd.
6/29	167	Stnd.	7/14	177	HWDE	6/9	162	Stnd.	11/14	188	Stnd.	7/22	199	Stnd.
6/30	357	HWDE	8/7	161	Stnd.	6/10	194	Stnd.				7/23	158	Stnd.
7/17	189	Stnd.	8/8	186	Stnd.	6/11	175	Stnd.				7/25	159	Stnd.
7/18	187	Stnd.	8/20	181	Stnd.	6/12	223	Stnd.				7/27	162	Stnd.
7/19	304	Stnd.	8/26	193	Stnd.	6/13	204	Stnd.				8/14	180	Stnd.
7/27	173	Stnd.	8/28	222	Stnd.	7/1	209	Stnd.				8/17	217	Stnd.
7/29	1367	HWDE	8/30	188	Stnd.	7/5	403	HWDE				8/25	157	Stnd.
8/13	195	Stnd.	8/31	157	Stnd.	7/6	261	Stnd.				9/4	162	Stnd.
8/16	189	HWDE	9/6	230	Stnd.	7/7	184	Stnd.				9/12	172	Stnd.
8/30	165	Stnd.	9/7	173	Stnd.	7/8	489	HWDE				9/17	190	Stnd.
9/13	173	Stnd.	9/18	164	Stnd.	7/9	212	HWDE				9/18	162	Stnd.
9/17	185	Stnd.	9/26	177	Stnd.	7/30	466	Stnd.				9/19	168	Stnd.
9/18	155	Stnd.	9/30	186	Stnd.	8/1	326	Stnd.				9/24	165	Stnd.
9/19	183	Stnd.	10/7	229	Stnd.	8/7	272	HWDE				9/28	246	Stnd.
9/26	303	HWDE	10/8	182	Stnd.	8/9	324	HWDE				9/29	181	Stnd.
10/12	164	Stnd.	10/13	179	Stnd.	8/10	314	HWDE				9/30	281	Stnd.
10/13	204	Stnd.	10/19	223	Stnd.	8/12	320	HWDE				10/1	224	Stnd.
10/24	167	Stnd.	10/24	246	Stnd.	8/20	210	HWDE				10/2	199	Stnd.
10/31	161	Stnd.	10/26	181	Stnd.							10/4	175	Stnd.
			11/13	213	Stnd.							10/5	192	Stnd.
			11/14	217	Stnd.							10/6	231	Stnd.
			11/16	197	Stnd.							10/7	253	Stnd.
			11/17	174	Stnd.							10/8	215	Stnd.
			11/27	155	Stnd.							10/9	160	Stnd.
			11/29	168	Stnd.							10/12	244	Stnd.
			11/30	169	Stnd.							10/13	245	Stnd.
			12/1	175	Stnd.							10/14	242	Stnd.
												10/15	160	Stnd.
												10/16	155	Stnd.
												10/18	248	Stnd.
												10/19	279	Stnd.
												10/20	240	Stnd.
												10/21	189	Stnd.
												10/22	205	Stnd.
												10/28	194	Stnd.
												11/1	172	Stnd.
												11/5	164	Stnd.
												11/6	263	Stnd.
												11/7	172	HWDE
												11/12	157	Stnd.
												11/17	191	Stnd.
												11/18	157	Stnd.
												11/21	184	Stnd.
												11/23	157	Stnd.
												11/25	189	Stnd.
												12/1	179	Stnd.

Note: Stnd. = standard exceedance; HWDE = High Wind Dust Event.

IMPRACTICABILITY OF ATTAINMENT BY 2022

Chapter 9 of this Plan includes a request for an extension of the current West Pinal County Serious Area attainment date of December 31, 2022. Clean Air Act Section 188(e) allows for an extension of the Serious Area attainment date if certain provisions are met. The first provision discussed is whether or not the existing attainment date is impracticable. This section of Chapter 3 includes a demonstration based solely upon monitoring data that attaining the PM-10 standard in the West Pinal County nonattainment area by December 31, 2022 is impracticable.

In order to attain the PM-10 standard by December 31, 2022, the form of the PM-10 standard requires that the West Pinal County nonattainment area cannot have more than three non-exceptional event exceedances at each monitoring site within the three-year period of 2020-2022. As shown in Table 3-10, PM-10 monitoring data at the Hidden Valley monitor indicates there are 56 non-exceptional event exceedances in 2020. This exceeds the three allowable for the period of 2020-2022. Therefore, the 2020 PM-10 monitoring data in the West Pinal County nonattainment area indicates that attainment of the PM-10 standard by December 31, 2022 is impracticable. In order to demonstrate attainment of the PM-10 standard in the West Pinal County nonattainment area, an extension of the attainment date will be required.

4. EVALUATION OF PM-10 CONTROL MEASURES

This chapter documents the processes by which PM-10 control measured were evaluated in support of the 2022 Serious Area PM-10 Plan. It begins with an overview of the existing PM-10 control measures in place within the nonattainment area before describing the analysis of candidate Best Available Control Measures (BACM) and Most Stringent Measures (MSM) for the Serious PM-10 nonattainment area.

OVERVIEW OF EXISTING PM-10 CONTROL MEASURES

This section provides a summary of the existing measures in place to reduce PM-10 particulate pollution. The existing measures provide the foundation upon which to evaluate and implement additional control strategies.

Within the West Pinal County nonattainment area, there are a number of air quality control measures currently in place to reduce particulate pollution. These measures have been implemented over the last several years in accordance with the measures adopted under ADEQ 2015 West Pinal Moderate PM10 Nonattainment Area SIP. Although ADEQ withdrew the 2015 West Pinal Moderate Area Plan on May 17, 2021, the rules it contained (including agricultural dust rules) are still being implemented and enforced.

Table 4-1 lists and summarizes the existing PM-10 control measures implemented in the West Pinal County nonattainment area. It identifies the applicable rule/regulation (and implementing agency), the source categories addressed under each rule, and provides a brief description of the activities, control requirements and key provisions it contains.

The existing control measures summarized in Table 4-1 only reflect rules/regulations applicable to PM-10 source categories of significance. As discussed in detail later in Chapter 5, the source categories of significance for evaluating 24-hour PM-10 controls consisted of the following:

- Construction Sites
- Cleared Areas
- Desert Shrubland
- Developed Rural and Developed Urban Lands
- Dairies
- Confined Animal Facility Operations (CAFOs)
- Agricultural Operations
- Unpaved Roads
- Unpaved Lots
- Paved Roads

West Pinal County also includes countywide fugitive dust rules that are less stringent than those listed in Table 4-1 and were therefore not shown in Table 4-1.

Table 4-1
Summary of Existing PM-10 Control Measures in West Pinal County

Rule/Regulation	Source Categories	Summary
West Pinal County Rule 4-1[a]	Cleared Areas, Unpaved & Paved Public Roads, Unpaved Lots	Control of fugitive dust within the West Pinal County PM-10 nonattainment area by requiring measures to prevent, reduce or eliminate fugitive dust emissions. Source specific thresholds, standards, control measures and recordkeeping requirements are specified and include visible dust/opacity limits, stabilization requirements, signage/barriers and vegetative cover.
West Pinal County Rule 4-3[a]	Construction, Paved Roads	Control of fugitive dust within the West Pinal County PM-10 nonattainment area specific to construction activity. Targeted activities include bulk material handling, storage, and transfer, earthmoving, leveling, drilling, construction, demolition and trackout. Measures include watering, chemical stabilizers/dust suppressants, vehicle speed and access limits, material hauling freeboard and coverage requirements and trackout controls. Permit and recordkeeping requirements also apply.
Arizona Administrative Code (AAC) R18-2-610.03[c]	Agricultural Operations	State-adopted regulation that consists of an agricultural PM general permit for crop operations within the West Pinal County PM-10 nonattainment area. It requires commercial farmers to implement agricultural best management practices (BMPs) to control fugitive dust on both forecast high risk days and all days for specific types of crop operations that include tillage, ground operations/harvest, noncropland, commercial farm roads and cropland.
Arizona Administrative Code (AAC) R18-2-611.03[c]	Dairies & CAFOs	State-adopted regulation that consists of an agricultural PM general permit for animal operations within the West Pinal County PM-10 nonattainment area. It requires commercial animal operators to implement best management practices (BMPs) to control fugitive dust for specific types of animal operations that include arenas/corrals/pens, animal waste/feed handling and transport, unpaved access connections, and unpaved roads or feed lanes. Dairies must also implement additional BMPs on trafficked unpaved roads on forecasted high risk days.
Arizona Administrative Code (AAC) R18-2-612.01[c]	Agricultural Operations	State-adopted regulation that consists of an agricultural PM general permit for irrigation districts in PM-10 nonattainment areas designated after June 1, 2009. It requires irrigation districts to implement best management practices (BMPs) to control fugitive dust for unpaved areas and maintenance roads, canals, and unpaved utility access roads.

In addition to the summaries for existing control measures listed in Table 4-1, Appendix C, Exhibit 1 contains detailed language for these applicable existing control measures from West Pinal County rules and Arizona statutes (ARS) and regulations (AAC).

These existing rules/regulations and their control measures and provisions formed the starting point for evaluating candidate BACM and MSM measures as described in the following section.

ANALYSES OF CANDIDATE BEST AVAILABLE CONTROL MEASURES AND MOST STRINGENT CONTROL MEASURES

The Clean Air Act (CAA) requires areas designated as Serious PM-10 nonattainment areas to implement Best Available Control Measures (BACM) and Best Available Control Technology (BACT) on all significant sources of PM-10 or PM-10 precursor emissions. BACT applies to major stationary sources (over 70 tons/year of PM-10 in Serious Areas), while all remaining emission sources above significance levels defined by EPA[1] are subject to BACM requirements. According to the CAA, BACM are required to be implemented no later than four years after the effective date of when a nonattainment area is reclassified from a Moderate Area to a Serious Area. For the West Pinal County nonattainment area, that date is July 24, 2024.

As explained earlier in Chapter 3, there are no stationary sources in West Pinal County that exceed the 70 ton/year PM-10 BACT threshold and evaluation of PM-10 precursors within the nonattainment area found their emissions were not significant as they relate to secondary formation of PM-10. Therefore, BACT requirements do not apply in this 2022 Serious Area PM-10 Plan.

As discussed in Chapter 3, attainment of the 24-hour PM-10 standard by December 31, 2022 has been found to be impracticable, triggering the need to request an extension of the attainment date and with it, a requirement to also evaluate Most Stringent Measures (MSM). MSMs are those that are included in the plan of any State or are achieved in practice in any State and can feasibly be implemented in the West Pinal nonattainment area, even if such implementation occurs after the statutory December 31, 2022 attainment date for the West Pinal nonattainment area.

This section therefore discusses the analysis of candidate measures that would satisfy BACM and MSM requirements.

Areas Surveyed

Given the list of significant PM-10 source categories and existing control measures within the West Pinal County nonattainment area, the first step in identifying candidate BACM/MSM measures consisted of identifying existing Serious PM-10 nonattainment

[1] EPA defines significant sources as those contributing more than 5 $\mu g/m^3$ to a violation of the 24-hour PM-10 standard or 1 $\mu g/m^3$ to a violation of the annual PM-10 standard.

areas and PM-10 maintenance areas formerly classified as a Serious Area, to survey. The following ten PM-10 areas were identified from EPA's "Green Book" list of 24-hour PM-10 nonattainment and maintenance areas[2] (as of March 31, 2021):

1. Clark County, NV (Maintenance)
2. Coachella Valley, CA (Nonattainment)
3. East Kern County, CA (Nonattainment)
4. Imperial Valley, CA (Maintenance)
5. Los Angeles South Coast Basin, CA (Maintenance)
6. Owens Valley, CA (Nonattainment)
7. Phoenix, AZ[3] (Nonattainment)
8. San Joaquin Valley Air Basin, CA (Maintenance)
9. Wallula, WA (Maintenance)
10. Washoe County, NV (Maintenance)

Adopted and implemented PM-10 controls in each of these nonattainment or maintenance areas for 24-hour PM-10 were evaluated in comparison with existing controls in West Pinal County to identify candidate BACM and/or MSM measures within the source categories of significance listed earlier. The candidate measure evaluations based on these planning areas is further described in the following subsections.

Sources of Candidate Measures

A variety of information sources for each of these ten planning areas was reviewed to identify candidate BACM and MSM measures. The purpose here was to ascertain relationships between control strategies and descriptions in SIPs and Maintenance Plans and actual adopted and implemented control measure rule language as well as data sources and methods used to estimate emission benefits and costs. Thus, the review of candidate measures in these PM-10 planning areas consisted of three primary sources:

1. SIPs/Maintenance plans and technical appendices,
2. State and county statutes, regulations and rules; and
3. Local ordinances.

Table 4-2 summarizes the key SIP/Maintenance Plans, state statutes, county regulations and rules, and local ordinances that were reviewed to identify and develop candidate BACM and MSM measures. Additional materials not listed in Table 4-2 (e.g., staff reports, etc.) were also examined where applicable. In addition, contacts with selected planning areas that included Clark County, NV, Washoe County, NV and Wallula, WA were established to obtained copies of materials referenced in website publications and/or to gather any available information on compliance and enforcement.

[2] https://www3.epa.gov/airquality/greenbook/pbca.html
[3] Includes portions of Maricopa County and Pinal County.

Table 4-2
Summary of Key BACM/MSM Candidate Information Measure Sources

Planning Area	SIPs & Maintenance Plans	State/County Statutes, Regulations & Rules	County Ordinances
West Pinal County, AZ	2015 Moderate Area SIP	Arizona Administrative Code (AAC) R18-2 Department of Environmental Quality - Air Pollution Control (12/2019) Arizona Revised Statutes (ARS) 49-457 - Agricultural BMP Committee (2021) ARS 11-877 (Air Quality Control Measures) Pinal County Air Quality Control District Code of Regulations (8/2020)	https://library.municode.com/az/pinal_county/codes/development_services_code_and_floodplain_management_?nodeId=PICODESECO
Clark County, NV	2001 PM10 SIP 2012 Redesignation Request and Maintenance Plan	Clark County Air Quality Regulations: Section 0 – Definitions (1/2020) Section 90 – Open Areas & Vacant Lots (1/2021) Section 91 – Unpaved Roads, Alleys, Easements (4/2014) Section 92 – Unpaved Parking Lots & Storage Areas (4/2014) Section 93 – Paved Roads & Street Sweepers (1/2020) Section 94 – Construction Activities (1/2020) Construction Activities Dust Control Handbook (3/2003)	https://library.municode.com/nv/clark_county/codes/code_of_ordinances
Coachella Valley, CA	1996 Maintenance Plan 2002 PM10 SIP 2003 PM10 SIP	South Coast AQMD[a] Rule 403.1 – Supplemental Dust Control Requirements for Coachella Valley Sources (4/2004)	https://library.municode.com/ca/riverside_county/codes/code_of_ordinances?nodeId=ORLIDITA
East Kern County, CA	2002 Maintenance Plan	Kern County Rule 401 – Visible Emissions (11/1993) East Kern APCD[b] Rule 402 – Fugitive Dust (3/2015) East Kern APCD Rule 402.2 – Agricultural Operations (3/2015)	https://library.municode.com/ca/kern_county/codes/code_of_ordinances?nodeId=COCOTADILI

Planning Area	SIPs & Maintenance Plans	State/County Statutes, Regulations & Rules	County Ordinances
Imperial Valley, CA	2009 PM10 SIP	Imperial County APCD Rules: Rule 800 – Gen. Reqmts. for PM10 Control (10/2012) Rule 801 – Construction & Earthmoving (11/2005) Rule 802 – Bulk Materials (11/2005) Rule 803 – Carry-Out & Track-Out (11/2005) Rule 804 – Open Areas (9/2018) Rule 805 – Paved & Unpaved Roads (10/2012) Rule 806 – Conservation Mgmt. Practices (10/2012)	https://library.municode.com/ca/imperial_county/codes/code_of_ordinances?nodeId=COCOTADILI
Los Angeles, South Coast Basin, CA	2003 Air Quality Management Plan 2007 Air Quality Management Plan 2010 Maintenance Plan	South Coast AQMD Rules: Rule 223 – Permits for Large CAFOs (6/2006) Rule 401 – Visible Emissions (11/2001) Rule 402 – Nuisance (5/1976) Rule 403 – Fugitive Dust (6/2005) Rule 403 Agricultural Handbook (12/1998) Rule 403 Implementation Handbook (4/2004) Rule 1186 – Paved & Unpaved Roads and Livestock Operations (7/2008) Rule 1186 Appendix A – Certified Street Sweeper Compliance Testing (9/1999)	https://library.municode.com/ca/los_angeles_county/codes/code_of_ordinances?nodeId=ORLIDITA https://library.municode.com/ca/orange_county/codes/code_of_ordinances https://library.municode.com/ca/riverside_county/codes/code_of_ordinances?nodeId=ORLIDITA https://codelibrary.amlegal.com/codes/sanbernardino/latest/overview
Owens Valley, CA	2016 Owens Valley PM10 SIP 2018 Owens Valley RFP Report	Rules and Regulations for the Great Basin Unified Air Pollution Control District (4/2016)	http://www.qcode.us/codes/inyocounty/

Planning Area	SIPs & Maintenance Plans	State/County Statutes, Regulations & Rules	County Ordinances
Phoenix, AZ	1999 Maricopa County Nonattainment Area PM10 SIP[c] 2004 Revised PM10 SIP for Salt River Area 2007 Five-Percent Plan for PM10 for Maricopa County Nonattainment Area 2012 Five-Percent Plan for PM10 for Maricopa County Nonattainment Area	Arizona Administrative Code (AAC) R18-2 Department of Environmental Quality - Air Pollution Control (December 2019) Arizona Revised Statutes (ARS) 49-457 - Agricultural BMP Committee (2021) ARS 11-877 (Air Quality Control Measures) Maricopa County Air Pollution Control Regulations: Regulation II – Permits & Fees Rule 242 - Emission Offsets by Voluntary Paving of Unpaved Roads (6/2007) Regulation III – Control of Air Contaminants Rule 300 – Visible Emissions (3/2008) Rule 310.01 – Non-Traditional Fugitive Dust (1/2010) Rule 310.01 Appendix C – Fugitive Dust Test Methods (3/2008) Rule 310.10 – Fugitive Dust from Dust Generating Operations (1/2010)	https://www.maricopa.gov/733/Ordinances
San Joaquin Valley Air Basin, CA	1997 PM10 Attainment Plan 2003 PM10 Plan 2005 Amendments to 2003 PM10 Plan 2007 PM10 Maintenance Plan	San Joaquin Valley APCD Rules: Regulation IV – Prohibitions Rule 4550 – Conservation Mgmt. Practices (8/2004) List of Conservation Mgmt. Practices (8/2004) Rule 4570 – Confined Animal Facilities (9/2006) Regulation VIII – Fugitive PM10 Prohibitions Rule 8011 – General Requirements (8/2004) Rule 8021 – Construction, Demolition, Excavation, Extraction & Other Earthmoving Activities (8/2004) Rule 8031 – Bulk Materials (8/2004) Rule 8041 – Carryout & Trackout (8/2004) Rule 8051 – Open Areas (8/2004) Rule 8061 – Paved & Unpaved Roads (8/2004) Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas (9/2004) Rule 8081 – Agricultural Sources (9/2004)	https://library.municode.com/ca/fresno_county/codes/code_of_ordinances https://library.municode.com/ca/kern_county/codes/code_of_ordinances https://library.municode.com/ca/kings_county/codes/code_of_ordinances https://library.municode.com/ca/madera_county/codes/code_of_ordinances http://www.qcode.us/codes/mercedcounty/ https://library.municode.com/ca/san_joaquin_county/codes/code_of_ordinances https://qcode.us/codes/stanislauscounty/ https://www.codepublishing.com/CA/TulareCounty/

Planning Area	SIPs & Maintenance Plans	State/County Statutes, Regulations & Rules	County Ordinances
Wallula, WA	2018 Fugitive Dust Control Plan and Best Management Practices for Cattle Feeding Operations 2019 Maintenance Plan Revision	Washington State Code (WAC), Chapter 173-400 – General Regulations for Air Pollution Sources (10/2019)	https://library.municode.com/wa/walla_walla_county/codes/code_of_ordinances
Washoe County, NV	2014 Maintenance Plan	Washoe County District Board of Health Regulations Governing Air Quality Management (8/2021): 020 – General Provisions 040 – Prohibited Emissions: 040.030 – Dust Control (11/2002) 040.031 – Street Sanding Operations (2/2002) 040.032 – Street Sweeping Operations (2/2002)	https://library.municode.com/nv/clark_county/codes/code_of_ordinances

[a] Air Quality Management District.

[b] Air Pollution Control District.

[c] Including 2002 Technical Support Document.

The SIP and Maintenance Plan materials that were reviewed included all relevant appendices and technical support documents to the plans themselves. Applicable state statutes and relevant state and county regulations and rules were also reviewed to confirm the specifics of SIP measures/strategies that were adopted and implemented and to obtain more detail on regulation/rule language and provisions.

County ordinances for each planning area were also reviewed to ascertain whether additional, more stringent, or more detailed provisions were contained in ordinances applicable to fugitive dust control from sources identified as significant in West Pinal County. No county ordinances were found with control or reporting requirements that were more stringent than rules and regulations adopted within that county.

Table 4-3 summarizes this evaluation of ordinances, relative to adopted regulations/measures within each county. Although all ordinance codes were reviewed, Table 4-3 lists those that pertain to air quality emission controls. The rightmost column in Table 4-3 summarizes and compares the stringency of applicable ordinances to existing measures in West Pinal County or identifies linkages to county regulations and measures that were separately evaluated for stringency as explained in the following subsection.

Table 4-3
Ordinance Evaluation Summary

Planning Area	County	Reviewed Ordinances	Determination
West Pinal County, AZ	Pinal County	2.151.040. Special event permit. C.3.d. Dust control plan describing dust mitigation measures for all ingress, egress, and parking areas	Already applies in West Pinal County nonattainment area
Clark County, NV	Clark County	30.44.020 - Standards for Site Development	Clark County dust control Air Quality Regulations by reference (already included in stringency comparisons)
		30.68.060 - Smoke and Particulate Matter, Ch 9.08	Clark County Air Quality Regulations by reference (already included in stringency comparisons)
Coachella Valley, CA	Riverside County	Windblown Sand (482.2, 4/13/2000)	Less/as stringent, West Pinal Measure 4-2-020
		Mobile Source Air Pollution Reduction Programs (706.2, 9/5/1996)	Not applicable – relates to mobile exhaust which is not a significant source category
		Fugitive Dust/PM10 Control in Coachella Valley (742.1, 2/13/2004)	Use of SCAQMD Fugitive Dust Handbook, Fugitive Dust control plans
East Kern County, CA	Kern County	17.28.140 - Erosion Control	Less stringent, nuisance threshold
		19.12.130 - Review Procedures & Development Standards	Not applicable
		19.80.020 - Development Standards, Multifamily Residential Districts	Less/as stringent, West Pinal Measure 4-2-020
Imperial Valley, CA	Imperial County	None	Not needed
Owens Lake, CA	Inyo County	None	Not needed
Los Angeles, South Coast Basin, CA	Los Angeles County	2012-0027, Amends 5.90.010-050, Rule 2202 of SCAQMD	Not applicable
		91-0049U, Adds Ch 12.32 (Control of Hazardous Dust Conditions)	Less/as stringent, West Pinal Measure 4-2-020
		91-0104U, Amends Ch 12.32.10 (Control of Hazardous Dust Conditions)	Less/as stringent, West Pinal Measure 4-2-020
	Orange County	None	Not needed
	San Bernardino County	83.01.040 - Air Quality	Not applicable -- references SCAQMD diesel vehicle exhaust controls
		83.04.080 - Compliance with Dust Control Regulations	Less/as stringent, West Pinal Measure 4-2-020

Planning Area	County	Reviewed Ordinances	Determination
		88.02.040 - Dust Control - Desert Region	Less/as stringent, West Pinal Measure 4-2-020
	Riverside County	see Riverside County info above	see Riverside County info above
Phoenix, AZ	Maricopa County	P-21 - Vehicle Idling Restriction	Not applicable
		P-25 - Leaf Blower Restriction	Not applicable
		P-26 - Residential Woodburning Restriction	Not applicable
		P-27 - Vehicle Parking and Use on Unstabilized Vacant Lots	More stringent, already identified elsewhere
		P-28 - Off-Road Vehicle Use in Unincorporated Areas	More stringent, already identified elsewhere
San Joaquin Valley Air Basin, CA	Fresno County	None	Not needed
	Kern County	see Kern County info above	see Kern County info above
	Kings County	None	Not needed
	Madera County	8.85.040 - Dairy Operation Standards	Less stringent than AACR-18-2-611.01 for dairies -- only requires a fugitive dust control plan
	Merced County	18.40.030 - Air Emissions	San Joaquin Valley Rules & Regulations by reference, including urban land use dust controls (already included in stringency comparisons)
	San Joaquin County	9-1405.5 - Construction Site Removal	Grading compliance with San Joaquin Valley Rules & Regulations
		9-1410.3 - Development Standards	Grading compliance with San Joaquin Valley Rules & Regulations
		9-1025.3 - Air Quality	San Joaquin Valley Rules & Regulations by reference (already included in stringency comparisons)
	Stanislaus County	None	Not needed
	Tulare County	3-04 - Diesel-Fueled Idling Restrictions	Not applicable
Wallula, WA	Walla Walla County	None	Not needed
Washoe County, NV	Washoe County	None	Not needed

Stringency Evaluations

Control measure stringency evaluations were then conducted (comparing stringency of each applicable, adopted and implemented measure in the other ten planning areas to those that currently exist in West Pinal County. These evaluations were performed by source category for each of the source categories of significance in West Pinal County that were listed earlier in this chapter.

A critical element in these measure evaluations consisted of performing comparisons of stringency not by measures as a whole, but rather by individual measure provision. This is believed to be consistent with EPA guidance in its 1994 Addendum[4] to the General Preamble for implementing Title 1 of the Clean Air Act. Measure provisions refer to individual components of a measure that specify elements which include:

- *Definition/Applicability* – Description of the sources covered by a measure as well as exemptions or activity thresholds that define the extent/applicability of the measure. (Example: Do unpaved roads include alleys, horse trails or biking paths.)

- *Standards and Requirements* – Specifications of standards or test requirements that quantify a level of or amount of control. (Example: What traffic thresholds are subject to unpaved road controls.)

- *Control Implementation Conditions* – Indication of the amount, frequency and/or conditions under which controls must be applied. (Example: What is the minimum number of best management practices that must be applied for agricultural sources and under what conditions.)

- *Control Options* – List of available control technologies or practices that can be applied to reduce emissions in compliance with a control measure. (Example: Chemical suppressant and paving are options for controlling unpaved road dust.)

- *Training, Reporting, and Recordkeeping Requirements* – Delineates the requirements for keeping records of activities and compliance, responsibilities for ensuring compliance and procedures for reporting, providing access to, and maintaining these records and in some instances includes penalties for violations. (Example: Dust control permit requirements for construction sites specifying dust mitigation practices and methods to ensure on-site compliance.)

There are several other types of provisions for specific source categories and measures not listed above, but those listed were the most common across many of the sources and measures examined and are representative of the process used to “de-construct” each adopted measure from other planning areas into component parts under which the

[4] State Implementation Plans for Serious PM-10 Nonattainment Areas, and Attainment Date Waivers for PM-10 Nonattainment Areas Generally; Addendum to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, U.S. EPA, Vol. 59, No. 157, Federal Register, August 16, 1994.

stringency evaluations were then performed.

The rationale for de-constructing each control measure into component provisions or activities was twofold:

1. *Accuracy/Validity* – It made the comparative evaluations of stringency more straightforward and credible when performed by individual provision. Given the frequent lack of granular data for measure elements in many planning areas that ultimately affect the control effectiveness of a measure, it was often difficult to weight the relative effects of various elements such as an applicability threshold versus a larger menu of control options.

2. *Usefulness in MSM Determinations* – Since attainment within the West Pinal nonattainment area by the statutory attainment date of December 31, 2022 is impracticable, an attainment extension request and a demonstration of inclusion of Most Stringent Measures must be included in this 2022 Serious Area Particulate Plan for PM-10 Plan. De-constructing existing measures into component elements enabled provisions from other planning areas to be compared and selected individually within the stringency evaluations to support determination of MSM.

Table 4-4 provides a matrix showing how control measures under each applicable source category were de-constructed into individual provisions or measure activities. The column headings at the top of Table 4-4 list the source categories of significance (for BACM/MSM evaluation) for West Pinal County using the source category classifications as defined under the 2015 Moderate Area PM-10 SIP. (These classifications were used for this stage of the candidate BACM/MSM evaluation rather than those in the baseline inventory because the categories of significance subject to BACM were based on modeled source significance estimates from the Moderate SIP as explained in detail later in Chapter 5.)

Both the source category IDs and names are shown. The measure provision (or activity) number within each source category is listed down the leftmost column of Table 4-4. The source category ID and measure provision numbers were combined in an identification scheme used within the candidate measure analysis and stringency evaluations as presented in subsequent or referenced materials. For example, candidate measures that were assembled and for which stringency comparisons were performed for stabilization requirements on unpaved roads were given the source category/provision ID of “SC09-03” (Source Category 09 – Unpaved Roads, Measure Provision/Activity 03 – Stabilization Requirements) as shaded in green within the Table 4-4 matrix.

As shown in Table 4-4, control measures for construction sites tended to be very complex and were classified into a total of 27 individual provisions/activities. The number of provisions that measures were de-constructed into to perform the stringency comparisons for the other source categories ranged from 6 (Unpaved Lots) to 16 (Agricultural Sources).

Table 4-4
Source Category and Measure Provision Evaluation Matrix

Source ID:	SC01	SC02	SC03	SC04	SC05	SC06	SC7A	SC7B	SC7C	SC08	SC09	SC10	SC11
Source Name:	**Construction Sites**	**Cleared Areas**	**Desert Shrubland**	**Developed Urban Lands**	**Developed Rural Lands**	**Dairies**	**CAFOs - Poultry**	**CAFOs - Cattle**	**CAFOs - Swine**	**Agricultural Sources**	**Unpaved Roads**	**Unpaved Lots**	**Paved Roads**
Measure Provision			*No measures*	*Addressed under unpaved lots*									
01	Inactive & Pre/Post-Operation Areas & Roadways	Vacant Lots, Definition				Definition	Definition	Definition	Definition	Crop Operations, Implmtn. Rqmts.	Definition, Applicability	Definition	Unpaved Shoulder Work & Maintenance, Unpaved Shoulder Work, Maintenance & Stabilization
02	Stabilization Rqmts. for Inactive & Post-Operation Areas	Vacant Lots, Standards & Rqmts.				Implmtn. Requirement	Implmtn. Requirement	Implmtn. Requirement	Implmtn. Requirement	Crop Operations, Tillage	General Rqmts.	, Standards	New or Modified Roads, Shoulder & Median Widths & Curbing
03	Stabilization Rqmts. for Active Areas	Vacant Lots, Vehicle Use Measures				High Wind Days	High Wind Days	High Wind Days	High Wind Days	Crop Operations, Ground Operations & Harvest	Stabilization Rqmts.	Controls	Trackout, Trackout Limitations, Unpaved, Vacant Lots
04	Dust Generating Operations - Emission Standards	Vacant Lots, Other Control Measures				BMPs - Arenas, Corrals, & Pens	BMPs - Arenas, Corrals, & Pens	BMPs - Arenas, Corrals, & Pens	BMPs - Arenas, Corrals, & Pens	Crop Operations, Cropland	Controls	General Permits, Definitions	Trackout, Trackout Limitations, Construction Sites
05	Bulk Material Handling & Storage	Open Areas, Vacant Lots, Dust Mitigation Plan				BMPs - Animal Waste (& Feed) Handling & Transporting	BMPs - Animal Waste (& Feed) Handling & Transporting	BMPs - Animal Waste (& Feed) Handling & Transporting	BMPs - Animal Waste (& Feed) Handling & Transporting	Crop Operations, Noncropland	Implmtn. Effectiveness & Additional Rqmts.	General Permits, Provisions	Trackout, Paved Roadway Cleanup Controls
6	Bulk Material Hauling, Transporting, Offsite	Open Areas, Vacant Lots, Stabilization Rqmts.				BMPs - Unpaved Access Connections	BMPs - Unpaved Access Connections	BMPs - Unpaved Access Connections	BMPs - Unpaved Access Connections	Crop Operations, Commercial Farm Roads	Reporting Rqmts.	No New Unpaved Parking Lots, Storage Areas	Trackout, Contingency Controls for Large Operations

Source ID:	SC01	SC02	SC03	SC04	SC05	SC06	SC7A	SC7B	SC7C	SC08	SC09	SC10	SC11
Source Name:	**Construction Sites**	**Cleared Areas**	**Desert Shrubland**	**Developed Urban Lands**	**Developed Rural Lands**	**Dairies**	**CAFOs - Poultry**	**CAFOs - Cattle**	**CAFOs - Swine**	**Agricultural Sources**	**Unpaved Roads**	**Unpaved Lots**	**Paved Roads**
Measure Provision			*No measures*	*Addressed under unpaved lots*									
07	Bulk Material Hauling, Transporting, Onsite	Open Areas, Vacant Lots, Weed Abatement, Trash Removal				BMPs - Unpaved Roads or Feed Lanes	BMPs - Unpaved Roads or Feed Lanes	BMPs - Unpaved Roads or Feed Lanes	BMPs - Unpaved Roads or Feed Lanes	Crop Operations, Bulk Materials - Storage	Off Road Event, Competition		PM10-Certified Sweepers, Freeway Implmtn.
08	Trackout Control	Open Areas, Vacant Lots, High Risk Days				BMPs - Unpaved Vehicle, Equipment Traffic Areas	BMPs - Unpaved Vehicle, Equipment Traffic Areas	BMPs - Unpaved Vehicle, Equipment Traffic Areas	BMPs - Unpaved Vehicle, Equipment Traffic Areas	Crop Operations, Bulk Materials - Handling & Transport			PM10-Certified Sweepers, Arterial Implmtn.
09	Dust Suppression for Active Working Areas, Parking Areas & Unpaved Access/Haul Roads	General Permits, Definitions				Permit & Compliance	BMPs - Open Areas	Permit & Compliance	Permit & Compliance	Crop Operations, Significant Agricultural Earth Moving Activities			General Controls, Other Non-Trackout Sweeping, Equipment & Cleanup Rqmts.
10	Dust Suppression for Disturbed Surface Areas & General Earthmoving Activity	General Permits, Provisions					Permit & Compliance			Crop Operations, Windblown Dust			Non-Conforming Roads
11	Demolition	Open Areas, Vacant Lots, Recrdkpng. & Reporting Rqmts.								Crop Operations, Permits & Compliance			Recrdkpng. & Reporting Rqmts.
12	Weed Abatement									Irrigation Districts, Implmtn. Requirement			
13	Blasting									Irrigation Districts, Irrigation (Unpaved operation & maintenance roads)			

Source ID:	SC01	SC02	SC03	SC04	SC05	SC06	SC7A	SC7B	SC7C	SC08	SC09	SC10	SC11
Source Name:	**Construction Sites**	**Cleared Areas**	**Desert Shrubland**	**Developed Urban Lands**	**Developed Rural Lands**	**Dairies**	**CAFOs - Poultry**	**CAFOs - Cattle**	**CAFOs - Swine**	**Agricultural Sources**	**Unpaved Roads**	**Unpaved Lots**	**Paved Roads**
Measure Provision			*No measures*	*Addressed under unpaved lots*									
14	Backfilling									Irrigation Districts, Irrigation (Canals)			
15	Clearing & Grubbing									Irrigation Districts, Irrigation (Unpaved utility access roads)			
16	Clearing Forms									Irrigation Districts, Permits & Compliance			
17	Crushing												
18	Cut & Fill												
19	Screening												
20	Trenching												
21	Paving/Subgrade Preparation												
22	Dust Control Permit Applicability & Contents												
23	Dust Control Permitting & Recrdkpng. Rqmts.												
24	Dust Control Plan & Recrdkpng. Rqmts.												
25	Dust Control Permit/Plan Compliance Monitoring & Violations												
26	Project Signage for Compliance												
27	Dust Control Coordinator & Training Rqmts.												

As noted at the top of Table 4-4 no candidate measures were identified to control emissions on Desert Shrubland (where no human activity occurs) and measures pertaining to Developed Rural and Urban Lands were addressed under Unpaved Lots.

All told, stringency evaluations were performed for a total of 115 source category/measure provision combinations. A detailed stringency evaluation comparison table was then prepared for each of these 115 source category/measure provision combinations. Table 4-5 presents an example of a comparison table, for the “CAFOs/Cattle” source category and the “Definition” provision.

At the top of Table 4-5, the subtitle (shown in red) identifies the source category the table pertains to. In this example, “Fugitive Dust from Confined Animal Feeding Operations (CAFOs) - Cattle”. Below this, the first table row titled “PM-10 Emissions Significant Source Subcategory” lists the source subcategory. This is usually the same as the source category, but in a few instances, sources are also subcategorized.

The second row of each table titled “Activity Being Evaluated” identifies the measure activity or provision for which the stringency comparison is made. For this example in Table 4-5, it is the “Definition” provision or activity shown in red.

The third row, “Description of Best Available and/or Most Stringent Measure Available for the Activity,” highlighted in yellow lists the most stringent measure activity or provision found across all applicable PM-10 planning areas for which the comparisons were conducted, or the action needed to revise or include measures for the West Pinal County nonattainment area to match this stringency. For the Table 4-5 example, the BACM/MSM action recommends tightening the threshold of Cattle CAFOs subject to fugitive dust rules from 500 cattle down to 50 cattle. In cases where the corresponding West Pinal County measure is determined to be greater or equal to the most stringent provision across all planning areas, this row indicates no additional action is required to meet BACM/MSM for that specific provision.

The fourth and final summary row at the top of each table is titled “Stringency Evaluation of the Best Available and/or Most Stringent Measure Available for the Activity” and summarizes which planning area or areas have the more stringent provisions that West Pinal County, which is believed to be the most stringent and explains why. For this example, Table 4-5 indicates the Coachella Valley and South Coast Air Basin planning areas have the most stringent definition or cattle head-based applicability threshold.

Below these summary rows, the body of the comparison table shows relevant measure language from adopted statutes, regulations and rule for that source category and activity provision across each planning area with a measure for that provision. West Pinal County is always shown in the upper left. Cells or areas of the table body shaded in green reflect planning areas found to have the most stringent provision (sometimes this included multiple planning areas).

Table 4-5
Measure Stringency Evaluation Example – CAFOs/Cattle, Definition

Summary Analysis Table for the PM-10 Emissions Significant Source Category of: Fugitive Dust from Confined Animal Feeding Operations (CAFOs) - Cattle

PM-10 Emissions Significant Source Subcategory:	Cattle
Activity Being Evaluated:	Definition
Description of Best Available and/or Most Stringent Measure Available for the Activity:	Tighten definition of Cattle CAFOs subject to fugitive dust rules from a minimum of 500 cattle down to 50 animals.
Stringency Evaluation of the Best Available and/or Most Stringent Measure Available for the Activity:	Coachella and South Coast are the most stringent based on number of animals.

Control Measure Comparison Table for: Definition of Confined Animal Feeding Operations - Cattle

West Pinal County, Arizona	Maricopa County, Arizona	San Joaquin Valley Air Basin, California
Description of Control Measure	**Description of Control Measure**	**Description of Control Measure**
AAC R18-2-611. Definitions for R18-2-611.01, R18-2-611.02, R18-2-611.03. 3. The following definitions apply to a commercial beef cattle feedlot: f. "Commercial beef cattle feedlot" means a beef cattle feedlot with more than 500 beef cattle within the boundary of the Maricopa PM nonattainment area and Maricopa County portion of Area A, a PM nonattainment area designated after June 1, 2009 as stated in A.R.S. § 49-457(P)(1)(f), or the Pinal County PM Nonattainment Area.	AAC R18-2-611. Definitions for R18-2-611.01, R18-2-611.02, R18-2-611.03. 3. The following definitions apply to a commercial beef cattle feedlot: f. "Commercial beef cattle feedlot" means a beef cattle feedlot with more than 500 beef cattle within the boundary of the Maricopa PM nonattainment area and Maricopa County portion of Area A, a PM nonattainment area designated after June 1, 2009 as stated in A.R.S. § 49-457(P)(1)(f), or the Pinal County PM Nonattainment Area.	SJVAPCD Rule 4550 (CONSERVATION MANAGEMENT PRACTICES) 3.0 Definitions 3.2 Agricultural Operations: the growing and harvesting of crops or the raising of fowl or animals, for the primary purpose of earning a living, or of conducting agricultural research or instruction by an educational institution. 3.3 Agricultural Operation Site: one or more agricultural parcels that meet the following: 3.3.1 Are under the same or common ownership or operation, or which are owned or operated by entities which are under common control; and 3.3.2 Are located on one or more contiguous or adjacent properties wholly within the San Joaquin Valley Air Basin. 3.4 Agricultural Parcel: a portion of real property, including, but not limited to, cropland, and animal feeding operation (AFO) used by an owner/operator for carrying out a specific agricultural operation. Roads, vehicle/equipment traffic areas, and facilities, on or adjacent to the cropland or AFO are part of the agricultural parcel. 3.6 Animal Feeding Operation (AFO): a lot or facility where animals have been, are, or will be gathered, fed, stabled, for a total of 45 days or more in any 12 month period and where crops, vegetation, forage growth, or post-harvest residues are not sustained over any portion of the lot or facility (as defined in 40 CFR 122.23 (b)(1)). 4.0 Exemptions 4.2 The provisions of this rule, except for the recordkeeping provisions of Section 6.5.2, shall not apply to any of the following sources within an agricultural operation site: 4.2.2 An AFO of cattle, other than mature dairy cows or veal calves, with less than 190 cattle, other than mature dairy cows or veal calves. Cattle includes, but is not limited to, heifers, steers, bulls and cow/calf pairs

Table 4-5 (continued)
Measure Stringency Evaluation Example – CAFOs/Cattle, Definition

Control Measure Comparison Table (continued) for: Definition of Confined Animal Feeding Operations - Cattle

Coachella Valley, California	Los Angeles South Coast Air Basin, California
Description of Control Measure	**Description of Control Measure**
SCAQMD Rule 403. FUGITIVE DUST (c) Definitions (10) CONFINED ANIMAL FACILITY means a source or group of sources of air pollution at an agricultural source for the raising of 3,360 or more fowl or 50 or more animals, including but not limited to, any structure, building, installation, farm, corral, coop, feed storage area, milking parlor, or system for the collection, storage, or distribution of solid and liquid manure; if domesticated animals, including horses, sheep, goats, swine, beef cattle, rabbits, chickens, turkeys, or ducks are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing. (34) UNPAVED ROADS means any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by typical roadway materials. Public unpaved roads are any unpaved roadway owned by federal, state, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public. (g) Exemptions (1) The provisions of this Rule shall not apply to: (B) Confined animal facilities provided that the combined disturbed surface area within one continuous property line is one acre or less. SCAQMD Rule 1186. PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS, AND LIVESTOCK OPERATIONS (c) Definitions (12) LIVESTOCK OPERATIONS means any operation directly related to the raising of more than 50 animals for the primary purpose of making a profit or for a livelihood. (h) Exemptions The provisions of paragraphs (d)(6) and (d)(7) shall not apply to livestock operations whose contiguous bounded areas do not exceed ten acres.	SCAQMD Rule 403. FUGITIVE DUST (c) Definitions (10) CONFINED ANIMAL FACILITY means a source or group of sources of air pollution at an agricultural source for the raising of 3,360 or more fowl or 50 or more animals, including but not limited to, any structure, building, installation, farm, corral, coop, feed storage area, milking parlor, or system for the collection, storage, or distribution of solid and liquid manure; if domesticated animals, including horses, sheep, goats, swine, beef cattle, rabbits, chickens, turkeys, or ducks are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing. (34) UNPAVED ROADS means any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by typical roadway materials. Public unpaved roads are any unpaved roadway owned by federal, state, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public. (g) Exemptions (1) The provisions of this Rule shall not apply to: (B) Confined animal facilities provided that the combined disturbed surface area within one continuous property line is one acre or less. SCAQMD Rule 1186. PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS, AND LIVESTOCK OPERATIONS (c) Definitions (12) LIVESTOCK OPERATIONS means any operation directly related to the raising of more than 50 animals for the primary purpose of making a profit or for a livelihood. (h) Exemptions The provisions of paragraphs (d)(6) and (d)(7) shall not apply to livestock operations whose contiguous bounded areas do not exceed ten acres.

Note: Green shaded table cells refer to control measures definitively identified as most stringent. Cells shaded in gold indicate control measures that are potentially most stringent or include most stringent individual provisions that are highlighted.

Areas With No Comparable Measure Available: Clark County, Nevada; Washoe County, Nevada; East Kern County, California; Imperial Valley, California; Owens Lake, California; and Wallula, Washington.

Footnotes below each table explain the meanings of these cell shadings and identify planning area for which no similar measure provision exists as also shown in Table 4-5.

Appendix C, Exhibit 2 contains a complete set of the stringency comparison tables for the 115 candidate source category/measure provision combinations.

Summary of Candidate Measures

In performing the stringency comparisons for the measure/provision combinations (across West Pinal County and the other ten applicable PM-10 planning areas), the initial count of 115 count of candidate measures was whittled down to a final total of 70 BACM/MSM measures as shown in Table 4-6. As explained earlier, there were no control measures found for Desert Shrubland and those for Developed Rural and Urban Lands were related only to windblown dust and were handled in conjunction with the Unpaved Lots measures.

Table 4-6
Initial and Final Candidate BACM/MSM Measure Counts

Source Category	Source Category Name	Initial	BACM/MSM Stringency	Applicable	Grouped Final
SC01	Construction Sites	27	27	27	25
SC02	Cleared Areas	11	5	5	5
SC03	Desert Shrubland	None	0	0	0
SC04	Developed Rural Lands[a]	None	0	0	0
SC05	Developed Urban Lands[a]	None	0	0	0
SC06	Dairies	9	7	7	7
SC7A	CAFOs-Poultry	10	8	0	0
SC7B	CAFOs-Cattle	9	7	7	7
SC7C	CAFOs-Swine	9	7	0	0
SC08	Agriculture	16	7	7	7
SC09	Unpaved Roads	7	6	6	6
SC10	Unpaved Lots	6	3	3	3
SC11	Paved Roads	11	11	11	10
TOTALS		**115**	**88**	**73**	**70**

[a] Addressed under unpaved lots.

For 27 of the initial list of 115 candidates, West Pinal County was found to have the most stringent (or equally stringent) measure compared to the other planning areas, therefore already meeting BACM requirements. As shown at the bottom of Table 4-6, this left a remaining total of 88 candidate measures. Fifteen measures with the CAFO-Poultry and CAFO-Swine source categories were eliminated due to applicability; there are no poultry or swine CAFOs operating in the West Pinal County nonattainment area. Finally, once the other most stringent measures were identified for the remaining 73 candidates it was found that three could be grouped in conjunction with other measure provisions (from the same planning area and rule). Two of these were in the Construction Sites source category and one was in the Paved Roads category. This left a final total of 70 candidate

BACM/MSM measures for further evaluation.

These 70 final candidate measures (numbered Measure 1 through Measure 70), summary descriptions and the planning area from which the most stringent measure provision was identified are summarized in Table 4-7.

Table 4-7
Summary of Candidate BACM and MSM Measures

Source Category	Measure Number	BACM/MSM Measure Title	BACM/MSM Area
Construction Sites (SC01)	1	Require Dust Suppression Control Before and After Creation of Disturbed Surfaces	Maricopa County, Arizona
	2	Enhance Test Methods to Stabilize Inactive Disturbed Surface Areas	Maricopa County, Arizona
	3	Enhance Test Methods to Include Additional Stabilization Requirements/Standards	Maricopa County, Arizona
	4	Strengthen Visible Dust/Opacity Standards	Maricopa County, Arizona
	5	Tighten Bulk Material Transport Dust Control Requirements	Coachella Valley, California
	6	Strengthen & Expand Trackout Dust Control Requirements	Maricopa County, Arizona
	7	Adopt Disturbed Soil, Staging, Unpaved Routes & Parking Area Dust Best Management Practices (BMPs)	Clark County, Nevada
	8	Strengthen Soil Watering Requirement & Adopt Dust Palliative BMP	Clark County, Nevada
	9	Adopt Demolition / Implosion Dust BMP	Clark County, Nevada
	10	Adopt Weed Abatement Dust Controls	Maricopa County, Arizona
	11	Adopt Sand Blasting & Abrasive Blasting Dust BMPs	Clark County, Nevada
	12	Adopt Backfilling Dust Control BMP	Clark County, Nevada
	13	Adopt Clearing & Grubbing Dust Control BMP	Clark County, Nevada
	14	Adopt Foundation/Slab Form Clearing / Cleaning Dust BMP	Clark County, Nevada
	15	Adopt Crushing Operation Dust Control BMP	Clark County, Nevada
	16	Adopt Cut & Fill Activity Dust Control BMP	Clark County, Nevada
	17	Adopt Screening Operation Dust Control BMP	Clark County, Nevada
	18	Adopt Trenching Operation Dust Control BMP	Clark County, Nevada
	19	Adopt Paving/Subgrade Operation Dust Control BMP	Clark County, Nevada
	20	Strengthen Dust Control Plan Requirements	Maricopa County, Arizona
	21	Strengthen Dust Control Recordkeeping Requirements	Maricopa County, Arizona
	22	Strengthen Dust Control Coordinator Requirements	Maricopa County, Arizona
	23	Strengthen & Expand Dust Control Monitoring and Violation Requirements	Clark County, Nevada
	24	Strengthen Project & Trenching Signage Requirements	Clark County, Nevada
	25	Adopt Dust Control Training Requirements for Project Coordinators and Foreman	Maricopa County, Arizona

Source Category	Measure Number	BACM/MSM Measure Title	BACM/MSM Area
Cleared Areas (SC02)	26	Strengthen Standards for Vacant Lot Size Threshold for Opacity and Stabilization Requirements	Maricopa County, Arizona
	27	Strengthen Existing Vacant Lot Vehicle Use Requirements	Maricopa County, Arizona
	28	Strengthen Existing Vacant Lot Fugitive Dust Controls	Maricopa County, Arizona
	29	Require Mitigation Plans for Open Areas/Vacant Lots Over 10,000 Acres in Size	Clark County, Nevada
	30	Strengthen Weed Abatement Trash Removal Requirements for Open Areas/Vacant Lots	Clark County, Nevada
Dairies (SC06)	31	Tighten Definition of Dairies Subject to Fugitive Dust Rules	Coachella Valley, California
	32	Increase the Number of Dairy Operation Fugitive Dust BMPs	Maricopa County, Arizona
	33	Increase the Number of Dairy Operation Fugitive Dust BMPs for Arenas, Corrals and Pens	Maricopa County, Arizona
	34	Increase the Number of Dairy Operation Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Maricopa County, Arizona
	35	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Access Connections	Maricopa County, Arizona
	36	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Maricopa County, Arizona
	37	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	San Joaquin Valley Air Basin, California
Cattle CAFOs (SC7B)	38	Tighten Definition of Cattle Confined Animal Feeding Operations Subject to Fugitive Dust Rules	Coachella Valley, California
	39	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs	Maricopa County, Arizona
	40	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Arenas, Corrals and Pens	Maricopa County, Arizona
	41	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Maricopa County, Arizona
	42	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Access Connections	Maricopa County, Arizona
	43	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Maricopa County, Arizona
	44	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	Coachella Valley, California

Source Category	Measure Number	BACM/MSM Measure Title	BACM/MSM Area
Agriculture (SC08)	45	Increase the Number of BMPs to Control Fugitive Dust from Cropland Areas	Coachella Valley, California
	46	Increase the Number of BMPs to Control Fugitive Dust on Noncropland Areas That Are Not Tied to High-Risk Days	Imperial Valley, California
	47	Increase the Number of BMPs for the Control of Fugitive Dust from Commercial Farm Roads	Maricopa County, Arizona
	48	Stabilization Requirements for Off-Field Bulk Material Storage	San Joaquin Valley Air Basin, California
	49	Fugitive Dust Controls for Off-Field Bulk Material Handling and Transport	San Joaquin Valley Air Basin, California
	50	Increase the Minimum Number of Agricultural Earth Moving BMPs	Maricopa County, Arizona
	51	Require Implementation of BMPs to Control Windblown Dust from Crop Operations on All Days	East Kern County, California
Unpaved Roads (SC09)	52	Expand Unpaved Road Definitions to Include Alleys	Maricopa County, Arizona
	53	Increase Average Daily Traffic (ADT) Thresholds for Unpaved Road Controls	San Joaquin Valley Air Basin, California
	54	Visible Emissions and Stabilization Requirements for Unpaved Roads	San Joaquin Valley Air Basin, California
	55	Increase Stringency of Unpaved Road Paving and Dust Stabilization Controls	San Joaquin Valley Air Basin, California or Maricopa County, Arizona
	56	Expand Existing Reporting/Recordkeeping Requirements for Unpaved Roads	San Joaquin Valley Air Basin, California
	57	Explicit Dust Mitigation Controls for Off-Road Event Competitions on Unpaved Roads	Imperial Valley, California
Unpaved Lots (SC10)	58	Add 0% Opacity at Property Line Provision to Unpaved Lot Requirements	Clark County, Nevada
	59	More Stringent Unpaved Lot Fugitive Dust Control Measures	Maricopa County, Arizona
	60	Prohibit Unpaved Lot/Storage Areas on Hydrographic Lands	Clark County, Nevada
Paved Roads (SC11)	61	Strengthen Stabilization Requirements for Unpaved Shoulders	Clark County, Nevada
	62	Paving and/or Stabilization of Shoulders and Medians on New and Modified Paved Roads	Clark County, Nevada
	63	Immediate Cleanup of Trackout, Carry Out & Spillage from Areas Accessible to the Public	Maricopa County, Arizona
	64	Use of Only PM_{10}-Certified Street Sweepers to Clean Up Trackout Deposits on Paved Roads from Any Source	Coachella Valley, California
	65	Trackout Controls for Large Operations and Windy Conditions	Coachella Valley, California
	66	Use of PM_{10}-Certified Street Sweepers on Freeways	Coachella Valley, California
	67	Use of PM_{10}-Certified Street Sweepers on Arterial Roads	Coachella Valley, California

Source Category	Measure Number	BACM/MSM Measure Title	BACM/MSM Area
Paved Roads (SC11)	68	Require Use of Wetted Brushes and Blowers on Sweepers Used on Both Paved Roads and Parking Lots and Only Vacuum-Type Cleaning Equipment in Pavement Crack Sealing Applications	Clark County, Nevada
	69	Strengthen Existing Paved Road and Shoulder Standards Through Inclusion of Provisions Addressing Non-Conforming Roads and Shoulder Requirements	Clark County, Nevada
	70	Strengthen Reporting and Recordkeeping Requirements to Include Street-Sweeping Extent and Frequency as Well as Dust Control Plans That Affect Trackout Compliance	Maricopa County, Arizona

Estimation of Candidate Measure Emission Benefits, Cost and Cost-Effectiveness

The next step of the analysis further evaluated the 70 identified control measures for PM-10 emissions reductions and for technological and economic feasibility. To support the preparation of these estimate, contacts were established with the other applicable PM-10 planning areas including Clark County, Nevada, San Joaquin Valley, Imperial Valley and the South Coast Air Quality Management District, California and Maricopa County to assess their experience with individual control measures. Reviews of relevant dust control literature were also performed to obtain data on measured emission reductions. Contacts were established with local agencies to determine the cost of labor, equipment, materials, etc., located in West Pinal County. Emission estimates of control measure benefits were computed in a manner that is consistent with methods used to estimate source specific emissions in the SIP emission inventories.

Detailed spreadsheets were prepared to document information sources, assumptions and methods used to prepare estimates of emission benefits, costs and cost effectiveness for each control measure. These materials are provided in Appendix B, Exhibit 3.

A complete discussion of the demonstration that these candidate measures fulfill Best Available Control Measure requirements is presented in the next chapter (Chapter 5). Demonstration of inclusion of Most Stringent Measures is discussed later in Chapter 9.

Table 4-8 provides a summary of the name, analysis unit (to provide context on differences in values presented), cost, emission reductions, and cost effectiveness estimates for each of the identified measures. The measures are organized by source category. Several control measures were determined to have more stringent requirements than those currently in place in the West Pinal County nonattainment area but provided zero quantifiable benefits; they are still included in Table 4-8 with zero values given for cost, emission reductions and cost-effectiveness where applicable.

Table 4-8
BACM/MSM Measure Costs, Emission Reductions and Cost-Effectiveness

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Construction Sites	1	Require Dust Suppression Control Before and After Creation of Disturbed Surfaces	50 Acre Construction Project	$9,381	0.10	$94,199
	2	Enhance Test Methods to Stabilize Inactive Disturbed Surface Areas	50 Acre Construction Project	$122,397	2.37	$51,612
	3	Enhance Test Methods to Include Additional Stabilization Requirements/Standards	50 Acre Construction Project	$122,397	2.37	$51,612
	4	Strengthen Visible Dust/Opacity Standards	50 Acre Construction Project	$122,397	2.37	$51,612
	5	Tighten Bulk Material Transport Dust Control Requirements	Individual Haul Truck	$0	0	$0
	6	Strengthen & Expand Trackout Dust Control Requirements	Public Access Point	$1,817	0.0026	$696,054
	7	Adopt Disturbed Soil, Staging, Unpaved Routes & Parking Area Dust Best Management Practices (BMPs)	5 Acre Construction Project	$2,550	0.89	$2,867
	8	Strengthen Soil Watering Requirement & Adopt Dust Palliative BMP	50 Acre Construction Project	$10,255	2.59	$3,960
	9	Adopt Demolition / Implosion Dust BMP	20 Acre Implosion Project	$43,262	4.78	$9,047
	10	Adopt Weed Abatement Dust Controls	5 Acre Weed Abatement Project	$2,064	0.018	$113,091
	11	Adopt Sand Blasting & Abrasive Blasting Dust BMPs	1 Acre Abrasive Blasting Site	$2,025	0.00011	$17,713,432
	12	Adopt Backfilling Dust Control BMP	500 Foot Trench Excavation	$5,341	0.016	$329,344
	13	Adopt Clearing & Grubbing Dust Control BMP	50 Acre Construction Project	$9,141	0.032	$284,975
	14	Adopt Foundation/Slab Form Clearing / Cleaning Dust BMP	50 Acre Construction Project	$211	0.0017	$124,600

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
	15	Adopt Crushing Operation Dust Control BMP	Misting Control System-Yr	$14,989	1.40	$10,706
Construction Sites	16	Adopt Cut & Fill Activity Dust Control BMP	50 Acre Construction Project	$43,733	2.59	$16,888
	17	Adopt Screening Operation Dust Control BMP	1000 Acre Construction Project	$14,989	0.83	$17,986
	18	Adopt Trenching Operation Dust Control BMP	500 Foot Trench Excavation	$5,341	0.016	$329,344
	19	Adopt Paving/Subgrade Operation Dust Control BMP	0.25 Mile Paving Project	$2,068	0.0082	$252,957
	20	Strengthen Dust Control Plan Requirements	5 Acre Project	$73,310	0.69	$105,549
	21	Strengthen Dust Control Recordkeeping Requirements	50 Acre Construction Project	$117,145	4.99	$23,462
	22	Strengthen Dust Control Coordinator Requirements	50 Acre Project	$141,410	3.18	$44,466
	23	Strengthen & Expand Dust Control Monitoring and Violation Requirements	5 Acre Construction Project	$180,967	0.48	$379,366
	24	Strengthen Project & Trenching Signage Requirements	1 Acre Project	$143	0.018	$8,037
	25	Adopt Dust Control Training Requirements for Project Coordinators and Foreman	12.3 Acre Construction Project	$165,842	1.08	$153,876
Cleared Areas	26	Strengthen Standards for Vacant Lot Size Threshold for Opacity and Stabilization Requirements	0.1 Acre Vacant Lot-Yr	$344 - $385	0.018	$18,725 - $20,918
	27	Strengthen Existing Vacant Lot Vehicle Use Requirements	0.1 Acre Vacant Lot-Yr	$344 - $364	0.018	$18,725 - $19,813
	28	Strengthen Existing Vacant Lot Fugitive Dust Controls	0.1 Acre Vacant Lot-Yr	$344 - $364	0.018	$18,725 - $19,813
	29	Require Mitigation Plans for Open Areas/Vacant Lots Over 10,000 Acres in Size	1 Acre Cleared Area-Yr	$0	0	$0

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
	30	Strengthen Weed Abatement Trash Removal Requirements for Open Areas/Vacant Lots	5,000 Sq Ft Cleared Area-Yr	$236 - $2,995	0.021 - 0.058	$11,479 - $51,549
Dairies	31	Tighten Definition of Dairies Subject to Fugitive Dust Rules	Dairy Farm	$0	0	$0
Dairies	32	Increase the Number of Dairy Operation Fugitive Dust BMPs	Dairy Farm	*Costs and benefits evaluated individually for Measures 33-36*		
	33	Increase the Number of Dairy Operation Fugitive Dust BMPs for Arenas, Corrals and Pens	Nonattainment Area-Yr	$3,861	27.57 - 54.35	$71 - $140
	34	Increase the Number of Dairy Operation Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Nonattainment Area-Yr	N/A	N/A	N/A
	35	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Access Connections	Nonattainment Area-Yr	$607	1.18 - 2.32	$261 - $515
	36	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Nonattainment Area-Yr	$1,492	2.48 - 4.89	$305 - $601
	37	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	1 Acre Area-Yr	$779	0.029	$26,707
Cattle CAFOs	38	Tighten Definition of Cattle Confined Animal Feeding Operations Subject to Fugitive Dust Rules	Cattle Feedlot	$0	0	$0
	39	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs	Cattle Feedlot	*Costs and benefits evaluated individually for Measures 40-43*		
	40	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Arenas, Corrals and Pens	Nonattainment Area-Yr	$54,420 - $217,680	65.04 - 128.21	$424 - $3,347

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
	41	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Nonattainment Area-Yr	N/A	N/A	N/A
Cattle CAFOs	42	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Access Connections	Nonattainment Area-Yr	$91,268	44.07 - 86.89	$1,050 - $2,071
	43	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Nonattainment Area-Yr	$91,268	44.07 - 86.89	$1,050 - $2,071
	44	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	1 Acre Area-Yr	$779	0.029	$26,707
Agriculture	45	Increase the Number of BMPs to Control Fugitive Dust from Cropland Areas	Nonattainment Area-Yr	N/A	8.60 - 17.19	N/A
	46	Increase the Number of BMPs to Control Fugitive Dust on Noncropland Areas That Are Not Tied to High-Risk Days	Nonattainment Area-Yr	N/A	N/A	N/A
	47	Increase the Number of BMPs for the Control of Fugitive Dust from Commercial Farm Roads	Nonattainment Area-Yr	$353,408 - $1,277,048	375.96 - 896.98	$394 - $3,397
	48	Stabilization Requirements for Off-Field Bulk Material Storage	Nonattainment Area-Yr	N/A	N/A	N/A
	49	Fugitive Dust Controls for Off-Field Bulk Material Handling and Transport	Truck-Operating Day	$0	0	$0
	50	Increase the Minimum Number of Agricultural Earth Moving BMPs	Nonattainment Area-Yr	N/A	N/A	N/A
	51	Require Implementation of BMPs to Control Windblown Dust from Crop Operations on All Days	Nonattainment Area-Yr	$0	0	$0

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Unpaved Roads	52	Expand Unpaved Road Definitions to Include Alleys	Centerline Mile-Yr	$20,157	3.27	$6,161
	53	Increase Average Daily Traffic (ADT) Thresholds for Unpaved Road Controls	Nonattainment Area-Yr	$1,357,569	4,428.91	$307
Unpaved Roads	54	Visible Emissions and Stabilization Requirements for Unpaved Roads	Nonattainment Area-Yr	$1,357,569	4,428.91	$307
	55	Increase Stringency of Unpaved Road Paving and Dust Stabilization Controls	Centerline Mile-Yr	$6,784 - $94,877	6.55 - 20.15	$1,036 - $4,709
	56	Expand Existing Reporting/Recordkeeping Requirements for Unpaved Roads	15 Centerline Miles	$146,463	0.45	$327,745
	57	Explicit Dust Mitigation Controls for Off-Road Event Competitions on Unpaved Roads	Acre-Yr	$625	0.17	$3,625
Unpaved Lots	58	Add 0% Opacity at Property Line Provision to Unpaved Lot Requirements	50-Acre Area	$117,057	20.08	$5,829
	59	More Stringent Unpaved Lot Fugitive Dust Control Measures	Acre-Yr	$779	0.05 - 0.29	$2,671 - $15,481
	60	Prohibit Unpaved Lot/Storage Areas on Hydrographic Lands	Lot Acre-Yr	$16,994	2.71	$6,280
Paved Roads	61	Strengthen Stabilization Requirements for Unpaved Shoulders	Road Mile-Day	$50 - $134	0.00004 - 0.0016	$30,882 - $1,244,015
	62	Paving and/or Stabilization of Shoulders and Medians on New and Modified Paved Roads	Road Mile-Day	$50 - $134	0.00004 - 0.0016	$30,882 - $1,244,015
	63	Immediate Cleanup of Trackout, Carry Out & Spillage from Areas Accessible to the Public	Access Point-Yr	$2,274	0.020	$114,521
	64	Use of Only PM_{10}-Certified Street Sweepers to Clean Up Trackout Deposits on Paved Roads from Any Source	Centerline Mile-Yr	$14	0.40 - 1.52	$9 - $35
	65	Trackout Controls for Large Operations and Windy Conditions	Truck Operating Day	$0	0	$0

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
	66	Use of PM_{10}-Certified Street Sweepers on Freeways	Centerline Mile-Yr	$14	0.04 - 0.27	$51 - $340
	67	Use of PM_{10}-Certified Street Sweepers on Arterial Roads	Centerline Mile-Yr	$14	0.40 - 1.52	$9 - $35
Paved Roads	68	Require Use of Wetted Brushes and Blowers on Sweepers Used on Both Paved Roads and Parking Lots and Only Vacuum-Type Cleaning Equipment in Pavement Crack Sealing Applications	Road Mile-Yr	$0	0	$0
	69	Strengthen Existing Paved Road and Shoulder Standards Through Inclusion of Provisions Addressing Non-Conforming Roads and Shoulder Requirements	Road Mile-Yr	$784 - $18,363	0.01 - 0.59	$1,318 - $1,244,015
	70	Strengthen Reporting and Recordkeeping Requirements to Include Street-Sweeping Extent and Frequency as Well as Dust Control Plans That Affect Trackout Compliance	50 Acre Project	$56,927	0.81	$69,980

Notes:

1) Rows with values of zero reflect measures for which emission reductions were determined to be negligible.
2) N/A - Not Available. Costs and cost-effectiveness could not be credibly quantified due to lack of available data.
3) These measures may or may not be feasible and available to the implementing entities.

Similarly, those regulations which were determined to not be applicable because of threshold differences or insufficient data to prepare an analysis are included but listed with values of N/A (Not Available). Emission reductions are expressed in tons with significant digits presented as appropriate. Costs, emission reductions, and cost effectiveness are provided as bounded ranges for certain measures where different control technologies were available and/or different benefit assumptions were made.

5. DEMONSTRATION OF BEST AVAILABLE CONTROL MEASURES

This chapter of the 2022 Serious Area Particulate Plan for PM-10 constitutes the Best Available Control Measure (BACM) demonstration. It is a compilation of analyses designed to document the selection of controls for the 2022 Serious Area Particulate Plan for PM-10. Because of the relationship between control measure evaluations and the BACM demonstration, there is some overlap of material presented earlier in Chapter 4 and in this chapter. However, the primary purpose of this chapter is to document the procedures for determining BACM and how they were followed in fulfillment of the demonstration of BACM. An explanation of how the committed control measures in the plan also meet Most Stringent Measures (MSM) requirements is included in Chapter 9.

As a secondary function, this chapter also demonstrates that the West Pinal County PM-10 nonattainment area has implemented Reasonably Available Control Measures (RACM) fulfilling a requirement under its previous status as a moderate nonattainment area.

The Clean Air Act (CAA) requires areas designated as Serious Nonattainment for PM-10 to implement Best Available Control Measures and Best Available Control Technology (BACT) on all significant sources of PM-10 or PM-10 precursor emissions. EPA defines significant sources as those contributing more than 5 $\mu g/m^3$ to a violation of the 24-hour PM-10 standard. BACM is generally defined as the maximum degree of emission reduction considering technical/economic feasibility and environmental and other impacts of the control. According to the CAA, BACM are required to be implemented no later than four years after the effective date of when a nonattainment area is reclassified from a Moderate Area to a Serious Area. For the West Pinal County nonattainment area, that date is July 24, 2024.

As explained earlier in Chapter 3, there are no stationary sources in the West Pinal County nonattainment area that exceed the 70 ton/year PM-10 BACT threshold and an evaluation of PM-10 precursors within the nonattainment area found their emissions were not significant as they relate to secondary formation of PM-10. Therefore, BACT requirements do not apply and emissions sources of PM-10 precursors are not required to be evaluated for BACM.

BACM must be evaluated and implemented independent of attainment requirements. This means that BACM must be implemented even if it is not needed to attain the standards by the applicable attainment date since it would allow for an earlier attainment date.

DEFINITIONS

EPA defined the term “best available control measure” in subsection C of the 1994

Addendum to the General Preamble for Implementing Title I.[5] The definition was based upon interpretations of prior Congressional, court, and agency actions. These interpretations examined a number of different issues, such as the definitions of similar terms and the context in which similar regulations are applied.

Specifically, the definition of BACM that EPA has adopted reads in part:

... the maximum degree of emissions reduction of PM-10 and PM-10 precursors from a source ... which is determined on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, to be achievable for such source through the application of production processes and available methods, systems, and techniques for control of each pollutant. For PM-10, BACM must be applied to existing source categories in nonattainment areas that cannot attain within the moderate area timeframe.

Another issue discussed in subsection C is that EPA considers measures that prevent PM-10 emissions over the long term to be preferable to those measures that will only temporarily reduce emissions. The text states that "preventive measures are inherently more effective and involve fewer resources for surveillance, enforcement, and administration." As a result, EPA believes that increasing emphasis on prevention versus mitigation is more likely to be both economically and environmentally beneficial over the long term.

Another definition presented in subsection C is the threshold for de minimis levels. BACM is required for all source categories in Serious nonattainment areas unless the State demonstrates that the source category does not contribute significantly to nonattainment of the NAAQS. To aid States in determining those sources that are not significant, de minimis levels are defined on the basis of their contribution to ambient PM-10 levels and the appropriate standard. As noted earlier, the ambient PM-10 threshold is 5 ug/m^3 for the 24-hour average.

PROCEDURES FOR DETERMINING BACM AND MSM

EPA defined procedures for determining what BACM should be for PM-10 Serious nonattainment areas in Subsection D of the 1994 Addendum to the General Preamble for Implementing Title I. This EPA guidance[6] recommends the following steps for demonstrating that BACM has been implemented on all significant sources:

1. Inventory sources of PM-10 and PM-10 precursors
2. Evaluate source category impacts
    a. Determine a de minimis level for each pollutant

[5] State Implementation Plans for Serious PM-10 Nonattainment Areas, and Attainment Date Waivers for PM-10 Nonattainment Areas Generally; Addendum to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, U.S. EPA, Vol. 59, No. 157, Federal Register, August 16, 1994.
[6] *ibid.*

    b. Identify significant source categories
3. Evaluate alternative control techniques
4. Evaluate costs of control
    a. Technical feasibility
    b. Economic feasibility
    c. Environmental/Energy impacts

EPA guidance recommends several sources of information to identify feasible controls for each source of emissions. Perhaps the most important source is a direct comparison with measures adopted by other air pollution control agencies and other entities in areas with similar PM-10 problems and nonattainment status. Adopting entities are not required to adopt a measure just because it was adopted in another region, but it must provide the reasoning for rejecting measures. However, if a measure has been successfully implemented in another area it is considered feasible unless there are local conditions that impact feasibility.

As noted earlier in Chapter 4, comparative analyses to identify candidate BACM measures for significant PM-10 emissions sources, and the technical and economic feasibility analyses of candidate BACM measures have been prepared. The results of this work are provided in the following sections. Based on the comparative analysis and analysis of technical and economic feasibility, conclusions regarding BACM were able to be made. When an existing West Pinal County nonattainment rule or level of control met the BACM definition, no further analysis was required. When a rule or control provision from another area or from EPA guidance was identified that was more stringent, MAG analyzed the measure for technical and economic feasibility based on conditions in West Pinal County. As described in Chapter 6, any measure found to be more stringent than current West Pinal County measures for significant sources of PM-10 emissions was included in a Suggested List of Measures for evaluation and adoption by implementing entities. Ultimately, all suggested BACM that were found to be feasible were committed to by implementing entities and have been included in the 2022 Serious Area Particulate Plan for PM-10 as committed measures, as discussed in detail in Chapter 7.

The remaining portions of this chapter document the fulfillment of each of the four steps listed earlier for demonstration of BACM. For each step, the specific Subsection D requirements from the 1994 Addendum to the General Preamble for Implementing Title I are listed along with a demonstration of how they have been met. The requirements for and compliance with Steps 3 and 4 were combined into a single subsection that jointly addressed technological feasibility and emissions reductions, economic feasibility and costs of control and environmental impacts.

Step 1: Inventory Sources of PM-10 and PM-10 Precursors

Requirements – The BACM applicable in a nonattainment area must be determined on a case-by-case basis since the nature and extent of a nonattainment problem may vary within the area and from one area to another. Nonattainment problems range from

reasonably well-defined areas of violation caused by a specific source or group of sources to violations over relatively broad geographical areas due predominantly to large numbers of small sources widely distributed over the area.

Section 172(c)(3) of the Clean Air Act calls for all nonattainment areas to submit comprehensive, accurate, and current emissions inventories and provides for such periodic revisions as may be necessary to assure that the nonattainment planning requirements are met. If there have been any significant changes in PM-10 sources in the area since the inventory was first compiled (i.e., sources permanently shut down or new or modified sources constructed) or if the inventory is not adequate to support the more rigorous analysis required for serious area SIP demonstrations, it should be revised. All anthropogenic sources of PM-10 emissions and PM-10 precursors (if applicable) and non-anthropogenic sources in a nonattainment area must be included in the emission inventory.

Compliance Demonstration – EPA has identified four precursor pollutants that contribute to the formation of particulate matter (PM): ammonia (NH3), nitrogen oxides (NOx), sulfur dioxide (SO2) and volatile organic compounds (VOC). As opposed to the primary or direct emission of particulate matter, the four precursors are involved in the secondary formation of particulate matter, where the gas-phase of the four precursors undergo chemical reactions in the atmosphere to form particulate matter.

EPA has required that a state implementation plan for the West Pinal County PM-10 nonattainment area address the role of precursors in contributing to PM-10 exceedances in the nonattainment area. EPA has stated that “a state must include direct PM emissions and these four precursors in emissions inventories and must control emissions from sources of all of these pollutants, unless the state demonstrates to EPA’s satisfaction that control of one or more of these pollutants is not needed for expeditious attainment of the NAAQS in the nonattainment area at issue.” (EPA, 2021)

As explained earlier in Chapter 3, a weight of evidence report was prepared that provides a demonstration that the four particulate matter precursors identified by EPA do not significantly contribute to PM-10 exceedances in the West Pinal County PM-10 nonattainment area. The full report is available as an appendix to the 2017 Base Year PM-10 Emissions Inventory for the West Pinal County Serious PM-10 Nonattainment Area (Appendix A, Exhibit 1).

Table 5-1 (a reprint of Table 3-1) provides the 2017 baseline emissions inventory for directly emitted PM-10 by source category within the West Pinal County nonattainment area. As explained in Chapter 3, this emissions inventory is a “bottom-up” SIP-level inventory based on local activity data and emission factors reflecting local conditions within the nonattainment area. The inventory includes both activity-based anthropogenic emission sources as well as non-anthropogenic windblown dust emission sources.

Table 5-1
2017 Annual and Daily Average PM-10 Emissions
in the West Pinal County Nonattainment Area

Source Category	Annual PM-10 Emissions (tons/year)	Daily PM-10 Emissions (lbs/year)
Point Sources		
Permitted Sources	466	2,552
Nonpoint Sources		
Harvesting and Tilling	2,051	25,220
Concentrated Animal Feeding Operations (CAFOs)	1,353	7,416
Dairies	185	1,011
Construction	1,109	8,398
Commercial Cooking	100	545
Fuel Combustion	75	696
Miscellaneous Non-Industrial Processes	12	65
Open Burning	44	357
Unpaved Parking	304	1,659
Windblown Dust	3,705	20,302
Nonroad Mobile Sources		
Nonroad Mobile Sources	102	616
Onroad Mobile Sources		
Onroad Mobile Sources (exhaust, brake/tire wear)	162	882
Paved Road Dust	816	4,473
Unpaved Road Dust - Agricultural Roads	10,150	55,616
Unpaved Road Dust - Private Roads	12,961	71,018
Unpaved Road Dust - Public Roads	6,654	36,460
Unpaved Road Dust - Trails	656	3,597
Unpaved Road Dust - Test Tracks	265	1,447
Total	**41,168**	**242,332**

Step 2: Evaluate Source Category Impacts

Part A - Determine de minimis Levels for Each Pollutant

Requirements – As stated earlier, EPA generally presumes the contribution to nonattainment of any PM-10 emissions source category to be de minimis if the source category causes a PM-10 impact in the area of less than 5 $\mu g/m^3$ for a 24-hour average.

Compliance Demonstration – This 2022 Serious Area Particulate Plan for PM-10 is for the 24-hour PM-10 National Ambient Air Quality Standards. Thus, de minimis level for 24-hour PM-10 based on EPA guidance is 5 $\mu g/m^3$, meaning source categories with contributions to 24-hour PM-10 ambient concentrations less than 5 $\mu g/m^3$ are de minimis. BACM is not required for such categories. Source categories contributing 5 $\mu g/m^3$ or more

to 24-hour PM-10 are considered significant and BACM must be applied to these sources.

Part B - Identify Significant Source Categories

Requirements – The potential maximum impact of various source categories may have been determined with receptor or dispersion modeling performed for the attainment demonstration submitted with the Moderate Area SIP. In addition, the impact of some source categories may be apparent from analysis of ambient sampling filters from days when the standards are exceeded. If modeling was not performed during development of the moderate area SIP, receptor modeling, screening modeling or, preferably, refined dispersion modeling will generally be necessary to identify key source categories.

Compliance Demonstration – Identification of significant source categories subject to BACM analysis was performed in two stages. First, 2008 design day modeling from the West Pinal Moderate Area SIP[7] was utilized to make an initial assessment of the source categories of significance. Table 5-2 (from Table 1 in Appendix F of the Moderate SIP) summarizes modeling results conducted for 2008 design day episodes under the Moderate SIP. The Moderate SIP used AERMOD-based dispersion modeling and trajectory-based source apportionment modeling to model PM-10 concentrations on low wind (stagnation) and high wind design days, respectively. As explained there, source categories that did not contribute more than 0.5% of the design day emissions in any of the modeling domains were not included in stagnation or high-wind day source apportionment modeling because their contributions were negligible. These excluded emission categories are listed below:

- Nonroad,
- Railroads,
- Fires,
- Residential Fuel Combustion, and
- Open Burning.

[7] 2015 West Pinal Moderate PM10 Nonattainment Area SIP, Arizona Department of Environmental Quality, Air Quality Division, December 21, 2015.

Table 5-2
West Pinal County 24-Hour Design Day Modeled Source Impacts for 2008 (µg/m³) – From Moderate Area SIP

Source or Land Use Category		Low-Wind Modeled Impacts[a]			High-Wind Day Modeled Impacts[a]				Significant Category?		Category ID
		Cowtown	PCH	Stanfield	Cowtown	PCH	Stanfield	Maricopa	Low-Wind	High-Wind	
Point Sources (permitted)		0.2	0.0	N/M	0.2	0.0	N/M	-			
Construction Sites		0.9	0.0	0.2	**10.8**	0.0	0.0	**77.0**	Yes	Yes	1
Cleared Areas		N/M	N/M	N/M	1.2	**5.7**	2.6	**15.4**		Yes	2
Desert Shrubland	Non-Tribal	N/M	N/M	N/M	**35.1**	**20.5**	**18.4**	**8.5**	Yes	Yes	3
	Tribal	N/M	N/M	N/M	**6.9**	-	-	-	Yes	Yes	
	Total	N/M	N/M	N/M	**42.0**	**20.5**	**18.4**	**8.5**	Yes	Yes	
Developed Rural Lands		N/M	N/M	N/M	3.5	1.0	3.8	**6.3**		Yes	4
Developed Urban Lands		N/M	N/M	N/M	0.1	0.9	-	**6.9**		Yes	5
Other Windblown Dust		-	-	-	0.0	-	-	0.8			
Dairies		-	0.0	0.0	-	-	0.0	-	Yes	Yes	6
CAFOs		**199.5**	-	**22.2**	**9.8**	-	**14.9**	0.0	Yes	Yes	7a-7c
Agriculture (Cropland)	Non-Tribal	0.1	**6.3**	**6.3**	**48.4**	**173.1**	**78.5**	**19.2**	Yes	Yes	8
	Tribal	0.1	-	-	0.1	-	-	0.0			
	Total	0.2	**6.3**	**6.3**	**48.5**	**173.1**	**78.5**	**19.2**	Yes	Yes	
Unpaved Roads	Agricultural	**9.6**	**28.5**	**60.0**	**13.6**	**21.2**	**21.6**	3.5	Yes	Yes	9
	Public	**13.5**	**72.5**	**24.5**	**10.0**	**7.6**	**13.3**	0.6	Yes	Yes	
	Private (incl. irrigation)	1.2	**39.2**	**25.1**	**6.6**	**5.9**	4.6	1.9	Yes	Yes	
	Trail	0.0	**10.3**	1.5	0.7	2.2	2.7	0.1	Yes		
	Tribal	1.4	-	-	2.0	-	-	0.3			
	Test Track	0.8	-	-	1.4	-	-	-			
	Total	**26.5**	**150.5**	**111.1**	**34.3**	**36.9**	**42.1**	**6.4**	Yes	Yes	
Unpaved Parking Lots[b]		0.1	**5.6**	**5.2**	0.1	0.1	0.2	0.3	Yes		10
Paved Roads		**5.6**	4.1	**5.6**	0.3	0.1	0.6	0.9	Yes		11
Total[c]		**233.0**	**166.5**	**150.5**	**150.8**	**247.4**	**161.1**	**141.9**			

[a] Highlighted values denote modeled concentrations greater than the 5 µg/m3 24-hour average significance threshold. N/M means "not modeled," indicating these source categories were not evaluated for low wind conditions. A Hyphen (-) indicates no emission sources of this type are located in the modeling domain.

[b] The "Unpaved Parking Lots" source category only includes activity-based emissions. The windblown dust emissions from unpaved parking lots are a subset of the windblown dust emissions from the land use categories on which the lots sit: Cleared Areas, Developed Rural Lands, and Developed Urban Lands.

[c] These totals only include the impacts of local sources, i.e., those within each modeling domain. Regional background concentrations of PM10 are not included.

In Table 5-2, source categories for which 2008 design day 24-hour PM-10 concentrations under the Moderate SIP were at or above 5 μg/m^3 are highlighted in yellow. The rightmost columns in Table 5-2 shown in blue identify the source categories from the Moderate SIP modeling that were initially identified as significant and subject to the BACM evaluation. If a category exhibited modeled concentrations at or above the 5 μg/m^3 threshold on either low wind or high wind days, they were considered significant. The rightmost "Category ID" column in Table 5-2 list the categories treated as significant for BACM and lists their source category ID numbers as explained earlier in Chapter 4. (Categories not numbered in Table 5-2 were not considered significant.)

The second stage of the determination of significant source categories for BACM was performed using calibrated base year design day modeling results from this 2022 Serious Area Particulate Plan for PM-10 (Appendix B, Exhibit 1). Table 5-3 shows the results for each of the eight 2016-2018 design day episodes evaluated for attainment under this 2022 Serious Area Particulate Plan for PM-10. (Each design day is labeled as either "LW" for Low Wind or "EW" for Elevated Wind.)

As explained in detail in Chapter V of the Technical Support Document for the Serious Area Plan (Appendix B, Exhibit 1), AERMOD-based dispersion and distance-weighted rollback modeling were used to perform the attainment modeling under this Serious Area Particulate Plan for PM-10. Modeled concentrations shown in Table 5-3 are based on source category-specific outputs from AERMOD. The base year modeling results shown in Table 5-3 have been calibrated to match monitored design day concentrations.

Although there are descriptive differences between the source categories listed in Table 5-3 and those listed earlier in Table 5-1 for the 2017 Base Year emission inventory, they map to each other (i.e., they are the same source categories) and are adequate for this BACM source significance determination. (The categorizations in Table 5-3 are simply the result of how sources were organized/described for input to AERMOD.)

Category-specific modeled concentrations at or over the 5 μg/m^3 BACM significance threshold are highlighted in yellow in Table 5-3. Based on these modeled results, the rightmost column of Table 5-3 then identifies source categories above significance threshold for any design day, covering both low-wind and elevated wind exceedance conditions, the latter under which windblown dust impacts occur.

Comparing the source categories of significance between Table 5-2 and Table 5-3 indicates that no sources of significance were excluded from the BACM evaluation that was based on the Moderate SIP determinations shown in Table 5-2. (As explained in a footnote to Table 5-3, the Windblown Dust category there includes land use categories estimated to be significant from Table 5-2.) In fact, as highlighted in tan in the rightmost column of Table 5-3 two categories, Construction Sites and Paved Roads, were found have no modeled PM-10 concentrations over the BACM significance threshold based on the more recent emission inventory development and modeling conducted in support of this 2022 Serious Area Particulate Plan for PM-10.

Table 5-3
West Pinal County 24-Hour Design Day Modeled Source Impacts for 2017 Base Year (µg/m^3)

Source Category	Modeled 24-Hour Design Day PM-10 Concentrations (µg/m^3)								Equal or Over 5 µg/m^3?
	Hidden Valley				Stanfield			Pinal County Housing	
	06/15/17	08/28/17	10/07/17	07/06/18	06/18/16	07/16/16	07/06/18	12/01/17	
	LW[a]	EW[a]	LW[a]	EW[a]	LW[a]	EW[a]	EW[a]	LW[a]	
Permitted Point Sources	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	No
Agricultural (Crop Operations)	1.5	0.1	0.2	0.0	0.4	1.1	0.3	**15.5**	**Yes**
Construction Sites	0.8	0.0	0.3	0.0	0.0	0.0	0.0	0.3	No
CAFOs & Dairies	**5.0**	**19.7**	**10.5**	**24.1**	**140.0**	**22.4**	**6.4**	0.0	**Yes**
Open Burning	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No
Other Activity-Based Area Sources[b]	0.0	0.1	0.1	0.0	0.1	1.5	0.3	0.1	No
Windblown Dust[c]	0.0	**97.4**	0.0	**115.8**	0.0	**98.4**	**136.0**	0.0	**Yes**
Nonroad Mobile	0.2	0.1	0.1	0.1	0.1	0.6	0.2	0.2	No
Onroad Mobile	0.1	0.1	0.1	0.0	0.4	3.1	0.3	0.4	No
Paved Road Dust	0.6	0.3	0.4	0.2	0.7	1.4	1.1	4.8	No
Unpaved Ag Road Dust	**12.2**	4.0	**22.1**	0.6	**6.3**	**11.7**	**5.5**	**65.6**	**Yes**
Unpaved Parking Lot Dust	0.5	0.2	0.5	0.1	1.8	**10.6**	**6.2**	3.4	**Yes**
Unpaved Road Dust	**218.6**	**82.3**	**182.9**	**102.9**	**9.1**	**41.0**	**18.9**	**82.8**	**Yes**
Total Modeled Less Background	239.7	204.2	217.1	243.8	159.1	192.1	175.7	173.7	
Background	12.0	17.8	12.0	17.8	12.0	17.8	17.8	12.0	
Total Modeled PM-10	**251.7**	**222.0**	**229.1**	**261.6**	**171.1**	**209.9**	**193.5**	**185.7**	

[a] LW - low wind, EW - elevated wind. Windblown dust as modeled only affects elevated wind days.

[b] These other area sources include activity-based emissions from commercial cooking, residential fuel combustion and miscellaneous non-industrial processes.

[c] Windblown dust sources include cleared areas, desert shrubland, rural and urban developed lands uses, plus windblown emissions from activity-based sources listed in the table.

While construction sites and paved roads were found to be insignificant based solely upon the base year design day modeling for the 2022 Serious Area PM-10 Plan, these source categories were still included as significant sources for BACM analysis for the following reasons: (1) in the describing BACM, EPA states the following from earlier cited text "*For PM-10, BACM must be applied to existing source categories in nonattainment areas that cannot attain within the moderate area timeframe."* Since both construction sites and paved roads were previously identified as existing significant sources in the Moderate Area SIP submittal, it is appropriate to continue to include them in the BACM analysis in order to meet EPA BACM requirements; (2) the base year design days modeled for the 2022 Serious Area PM-10 Plan did not include all monitoring sites and all exceedance days. It is likely more urbanized sites that were not modeled (Casa Grande and Maricopa) may find construction and paved roads significant if modeled; and (3) on a regional basis, construction sites still appear to be significant based upon their contribution to the regional daily average PM-10 inventory (3.5%, Figure 3-2). Assuming PM-10 emissions are proportional to PM-concentrations, 3.5% of the daily inventory represents a PM-10 concentration contribution of 5.25 $\mu g/m^3$, which is above the significance threshold (3.5% of 150 $\mu g/m^3$).

Thus, the source categories listed in Table 5-4 were identified as significant and evaluated for BACM.

Table 5-4
Significant Source Categories Evaluated for BACM

Source Category	Source Category Name
SC01	Construction Sites
SC02	Cleared Areas
SC03	Desert Shrubland
SC04	Developed Rural Lands[a]
SC05	Developed Urban Lands[a]
SC06	Dairies
SC7A	CAFOs-Poultry
SC7B	CAFOs-Cattle
SC7C	CAFOs-Swine
SC08	Agriculture
SC09	Unpaved Roads
SC10	Unpaved Lots
SC11	Paved Roads

[a] Addressed under unpaved lots.

Steps 3 & 4 : Evaluate Alternative Controls for Technical & Economic Feasibility

Requirements – EPA guidance requires a review of all controls listed in the General

Preamble for Implementation of Title I,[8] PM10 Serious SIPs, adopted and implemented rules, and measures suggested in public comments sufficiently supported by documentation for the source categories determined to be significant must be reviewed.

In developing a fully adequate BACM plan, EPA requires that control measures discussed in BACM guidance documents and other relevant materials for all significant source categories be evaluated for technological and economic feasibility. Evaluations of energy and environmental impacts should also be considered in the assessment of candidate measures.

Compliance Demonstration – As described in Chapter 4, given the list of significant PM-10 source categories and existing control measures within the West Pinal County nonattainment area, the first step in identifying candidate BACM/MSM measures consisted of identifying existing Serious PM-10 nonattainment areas and PM-10 maintenance areas formerly classified as a Serious Area, to survey. The following ten PM-10 areas were identified from EPA's "Green Book" list of 24-hour PM-10 nonattainment and maintenance areas[9] (as of March 31, 2021):

1. Clark County, NV (Maintenance)
2. Coachella Valley, CA (Nonattainment)
3. East Kern County, CA (Nonattainment)
4. Imperial Valley, CA (Maintenance)
5. Los Angeles South Coast Basin, CA (Maintenance)
6. Owens Valley, CA (Nonattainment)
7. Phoenix, AZ[10] (Nonattainment)
8. San Joaquin Valley Air Basin, CA (Maintenance)
9. Wallula, WA (Maintenance)
10. Washoe County, NV (Maintenance)

Adopted and implemented PM-10 controls in each of these nonattainment or maintenance areas for 24-hour PM-10 were evaluated in comparison with existing controls in West Pinal County to identify candidate BACM and/or MSM measures within the source categories of significance listed earlier. The candidate measure evaluations based on these planning areas is further described in the following subsections.

Table 4-2 presented earlier in Chapter 4 lists the key SIP/Maintenance Plans, state statutes, county regulations and rules, and local ordinances that were reviewed to identify and develop candidate BACM and MSM control measures. Additional materials not listed in Table 4-2 (e.g., staff reports, etc.) were also examined where applicable. In addition, contacts with selected planning areas that included Clark County, NV, Washoe County, NV and Wallula, WA were established to obtained copies of materials referenced in website publications and/or to gather additional information on implementation and

[8] Federal Register, Volume 57, No. 74, April 16, 1992.
[9] https://www3.epa.gov/airquality/greenbook/pbca.html
[10] Includes portions of Maricopa County and Pinal County.

enforcement.

In all, 115 control measures were identified in this process. As explained earlier in Chapter 4, these 115 candidate measures were organized in a manner in which their stringency was compared to similar measures in West Pinal County, or to identify measures that have not been adopted and implemented in West Pinal County. These stringency comparisons were performed not by looking at measures as a whole, but rather by individual measure provision. This is believed to be consistent with EPA guidance in its 1994 Addendum[11] to the General Preamble for implementing Title 1 of the Clean Air Act. As described earlier in Chapter 4, measure provisions included:

- Definition/Applicability
- Standards and Requirements
- Control Implementation Conditions
- Control Options
- Training, Reporting, and Recordkeeping

The rationale for de-constructing and organizing measures into component provisions or activities was: 1) to increase the accuracy/validity of comparative stringency evaluations; and 2) to provide a foundation for determination of MSM by identifying the most stringent combinations of individual measure provisions across the surveyed PM-10 planning areas.

Table 5-5 (reprinted from Table 4-4) provides a matrix showing how control measures under each applicable source category were de-constructed into individual provisions or measure activities. The column headings at the top of Table 5-5 list the source categories of significance for BACM evaluation. Both the source category IDs and names are shown. The measure provision (or activity) number within each source category is listed down the leftmost column of Table 5-5. The source category ID and measure provision numbers were combined in an identification scheme used within the candidate measure analysis and stringency evaluations as presented in subsequent or referenced materials. For example, candidate measures that were assembled and for which stringency comparisons were performed for stabilization requirements on unpaved roads were given the source category/provision ID of “SC09-03” (Source Category 09 – Unpaved Roads, Measure Provision/Activity 03 – Stabilization Requirements) as shaded in green within the Table 5-5 matrix.

As shown in Table 5-5, control measures for construction sites tended to be very complex and were classified into a total of 27 individual provisions/activities. The number of provisions that measures were de-constructed into to perform the stringency comparisons for the other source categories ranged from 6 (Unpaved Lots) to 16 (Agricultural Sources).

As explained in detail in Chapter 4, these “provision-level” control stringency evaluations

[11] *Ibid.*

were performed by organizing all of the identified measures (across West Pinal County and the other ten applicable PM-10 planning areas) into a series of 115 detailed comparison tables, one for each source category and measure provision combination as listed in Table 5 5. In each individual table three key elements were documented:

1. *BACM Stringency* - Whether other measure provisions existed that were more stringent than those in West Pinal County (or that don't currently exist in West Pinal County),

2. *MSM Stringency* - Within those "more stringent" provisions, identified the provision and planning area that was evaluated to be the most stringent; and

3. *Candidate Rule Action* – Regulation/rule language from the most stringent measure provision (where applicable) was listed and used to summarize a candidate rule action for West Pinal County.

These stringency comparison and measure provision selected tables are provided in Appendix C, Exhibit 2.

Table 5-5
Source Category and Measure Provision Evaluation Matrix

Source ID:	SC01	SC02	SC03	SC04	SC05	SC06	SC7A	SC7B	SC7C	SC08	SC09	SC10	SC11
Source Name:	**Construction Sites**	**Cleared Areas**	**Desert Shrubland**	**Developed Urban Lands**	**Developed Rural Lands**	**Dairies**	**CAFOs - Poultry**	**CAFOs - Cattle**	**CAFOs - Swine**	**Agricultural Sources**	**Unpaved Roads**	**Unpaved Lots**	**Paved Roads**
Measure Provision			*No measures*	*Addressed under unpaved lots*									
01	Inactive & Pre/Post-Operation Areas & Roadways	Vacant Lots, Definition				Definition	Definition	Definition	Definition	Crop Operations, Implmtn. Rqmts.	Definition, Applicability	Definition	Unpaved Shoulder Work & Maintenance, Unpaved Shoulder Work, Maintenance & Stabilization
02	Stabilization Rqmts. for Inactive & Post-Operation Areas	Vacant Lots, Standards & Rqmts.				Implmtn. Requirement	Implmtn. Requirement	Implmtn. Requirement	Implmtn. Requirement	Crop Operations, Tillage	General Rqmts.	, Standards	New or Modified Roads, Shoulder & Median Widths & Curbing
03	Stabilization Rqmts. for Active Areas	Vacant Lots, Vehicle Use Measures				High Wind Days	High Wind Days	High Wind Days	High Wind Days	Crop Operations, Ground Operations & Harvest	Stabilization Rqmts.	Controls	Trackout, Trackout Limitations, Unpaved, Vacant Lots
04	Dust Generating Operations - Emission Standards	Vacant Lots, Other Control Measures				BMPs - Arenas, Corrals, & Pens	BMPs - Arenas, Corrals, & Pens	BMPs - Arenas, Corrals, & Pens	BMPs - Arenas, Corrals, & Pens	Crop Operations, Cropland	Controls	General Permits, Definitions	Trackout, Trackout Limitations, Construction Sites
05	Bulk Material Handling & Storage	Open Areas, Vacant Lots, Dust Mitigation Plan				BMPs - Animal Waste (& Feed) Handling & Transporting	BMPs - Animal Waste (& Feed) Handling & Transporting	BMPs - Animal Waste (& Feed) Handling & Transporting	BMPs - Animal Waste (& Feed) Handling & Transporting	Crop Operations, Noncropland	Implmtn. Effectiveness & Additional Rqmts.	General Permits, Provisions	Trackout, Paved Roadway Cleanup Controls
6	Bulk Material Hauling, Transporting, Offsite	Open Areas, Vacant Lots, Stabilization Rqmts.				BMPs - Unpaved Access Connections	BMPs - Unpaved Access Connections	BMPs - Unpaved Access Connections	BMPs - Unpaved Access Connections	Crop Operations, Commercial Farm Roads	Reporting Rqmts.	No New Unpaved Parking Lots, Storage Areas	Trackout, Contingency Controls for Large Operations

Source ID:	SC01	SC02	SC03	SC04	SC05	SC06	SC7A	SC7B	SC7C	SC08	SC09	SC10	SC11
Source Name:	**Construction Sites**	**Cleared Areas**	**Desert Shrubland**	**Developed Urban Lands**	**Developed Rural Lands**	**Dairies**	**CAFOs - Poultry**	**CAFOs - Cattle**	**CAFOs - Swine**	**Agricultural Sources**	**Unpaved Roads**	**Unpaved Lots**	**Paved Roads**
Measure Provision			*No measures*	*Addressed under unpaved lots*									
07	Bulk Material Hauling, Transporting, Onsite	Open Areas, Vacant Lots, Weed Abatement, Trash Removal				BMPs - Unpaved Roads or Feed Lanes	BMPs - Unpaved Roads or Feed Lanes	BMPs - Unpaved Roads or Feed Lanes	BMPs - Unpaved Roads or Feed Lanes	Crop Operations, Bulk Materials - Storage	Off Road Event, Competition		PM10-Certified Sweepers, Freeway Implmtn.
08	Trackout Control	Open Areas, Vacant Lots, High Risk Days				BMPs - Unpaved Vehicle, Equipment Traffic Areas	BMPs - Unpaved Vehicle, Equipment Traffic Areas	BMPs - Unpaved Vehicle, Equipment Traffic Areas	BMPs - Unpaved Vehicle, Equipment Traffic Areas	Crop Operations, Bulk Materials - Handling & Transport			PM10-Certified Sweepers, Arterial Implmtn.
09	Dust Suppression for Active Working Areas, Parking Areas & Unpaved Access/Haul Roads	General Permits, Definitions				Permit & Compliance	BMPs - Open Areas	Permit & Compliance	Permit & Compliance	Crop Operations, Significant Agricultural Earth Moving Activities			General Controls, Other Non-Trackout Sweeping, Equipment & Cleanup Rqmts.
10	Dust Suppression for Disturbed Surface Areas & General Earthmoving Activity	General Permits, Provisions					Permit & Compliance			Crop Operations, Windblown Dust			Non-Conforming Roads
11	Demolition	Open Areas, Vacant Lots, Recrdkpng. & Reporting Rqmts.								Crop Operations, Permits & Compliance			Recrdkpng. & Reporting Rqmts.
12	Weed Abatement									Irrigation Districts, Implmtn. Requirement			
13	Blasting									Irrigation Districts, Irrigation (Unpaved operation & maintenance roads)			

Source ID:	SC01	SC02	SC03	SC04	SC05	SC06	SC7A	SC7B	SC7C	SC08	SC09	SC10	SC11
Source Name:	**Construction Sites**	**Cleared Areas**	**Desert Shrubland**	**Developed Urban Lands**	**Developed Rural Lands**	**Dairies**	**CAFOs - Poultry**	**CAFOs - Cattle**	**CAFOs - Swine**	**Agricultural Sources**	**Unpaved Roads**	**Unpaved Lots**	**Paved Roads**
Measure Provision			*No measures*	*Addressed under unpaved lots*									
14	Backfilling									Irrigation Districts, Irrigation (Canals)			
15	Clearing & Grubbing									Irrigation Districts, Irrigation (Unpaved utility access roads)			
16	Clearing Forms									Irrigation Districts, Permits & Compliance			
17	Crushing												
18	Cut & Fill												
19	Screening												
20	Trenching												
21	Paving/Subgrade Preparation												
22	Dust Control Permit Applicability & Contents												
23	Dust Control Permitting & Recrdkpng. Rqmts.												
24	Dust Control Plan & Recrdkpng. Rqmts.												
25	Dust Control Permit/Plan Compliance Monitoring & Violations												
26	Project Signage for Compliance												
27	Dust Control Coordinator & Training Rqmts.												

In performing the stringency comparisons for the measure/provision combinations (across West Pinal County and the other ten applicable PM-10 planning areas), the initial count of 115 count of candidate measure/provisions was whittled down to a final total of 70 BACM/MSM measures as shown in Table 5-6 (reprinted from Table 4-6). As explained earlier, there were no control measures found for Desert Shrubland and those for Developed Rural and Urban Lands were related only to windblown dust and were handled in conjunction with the Unpaved Lots measures.

Table 5-6
Initial and Final Candidate BACM/MSM Measure Counts

Source Category	Source Category Name	Initial	BACM/MSM Stringency	Applicable	Grouped Final
SC01	Construction Sites	27	27	27	25
SC02	Cleared Areas	11	5	5	5
SC03	Desert Shrubland	None	0	0	0
SC04	Developed Rural Lands[a]	None	0	0	0
SC05	Developed Urban Lands[a]	None	0	0	0
SC06	Dairies	9	7	7	7
SC7A	CAFOs-Poultry	10	8	0	0
SC7B	CAFOs-Cattle	9	7	7	7
SC7C	CAFOs-Swine	9	7	0	0
SC08	Agriculture	16	7	7	7
SC09	Unpaved Roads	7	6	6	6
SC10	Unpaved Lots	6	3	3	3
SC11	Paved Roads	11	11	11	10
TOTALS		**115**	**88**	**73**	**70**

[a] Addressed under unpaved lots.

For 27 of the initial list of 115 candidates, West Pinal County was found to have the most stringent (or equally stringent) measure/provisions compared to the other planning areas, therefore already meeting BACM requirements. As shown at the bottom of Table 4-6, this left a remaining total of 88 candidate measure/provisions. Fifteen measures with the CAFO-Poultry and CAFO-Swine source categories were eliminated due to applicability; there are no poultry or swine CAFOs operating in the West Pinal County nonattainment area. Finally, once the other most stringent measure/provisions were identified for the remaining 73 candidates it was found that three could be grouped in conjunction with other measure provisions (from the same planning area and rule). Two of these were in the Construction Sites source category and one was in the Paved Roads category. This left a final total of 70 candidate BACM-level control measures for further evaluation.

Technological and economic feasibility evaluations were then performed for these final 70 candidate measures (numbered Measure 1 through Measure 70). To support the preparation of these estimate, contacts were established with the other applicable PM-10 planning areas including Clark County, Nevada, San Joaquin Valley, Imperial Valley and the South Coast Air Quality Management District, California and Maricopa County to assess their experience with individual control measures. Reviews of relevant dust control literature were also performed to obtain data on measured emission reductions. Contacts were established with local agencies to determine the cost of labor, equipment, materials, etc., located in West Pinal County. Emission estimates of control measure benefits were computed in a manner that is consistent with methods used to estimate source specific emissions in the SIP emission inventories.

Detailed spreadsheets were prepared to document information sources, assumptions and methods used to prepare estimates of emission benefits, costs and cost effectiveness for each control measure. These materials are provided in Appendix B, Exhibit 3.

Table 5-7 (reprinted from Table 4-8) provides a summary of the name, analysis unit (to provide context on differences in values presented), cost, emission reductions, and cost effectiveness estimates for each of the identified measures. The measures are organized by source category (e.g., construction, agriculture, unpaved roads, etc.). The BACM regulatory comparison analysis determined that several of the identified control measures in the other nonattainment and maintenance areas are not as stringent as those currently in effect in West Pinal County nonattainment area. Those measures were excluded from further analysis and are not included in Table 5-7. Several control measures were determined to have more stringent requirements than those currently in place in the West Pinal County nonattainment area but provided zero quantifiable benefits; they are still included in Table 5-7 with zero values given for cost, emission reductions and cost-effectiveness where applicable. Similarly, those regulations which were determined to not be applicable because of threshold differences or insufficient data to prepare an analysis are included but listed with values of N/A (Not Available). Emission reductions are expressed in tons with significant digits presented as appropriate. Costs, emission reductions, and cost effectiveness are provided as bounded ranges for certain measures where different control technologies are available and/or different benefit assumptions were made.

No collateral environmental impacts were found in evaluation of these 70 measures.

Table 5-7
BACM/MSM Measure Costs, Emission Reductions and Cost-Effectiveness

Source Category	Measure Number	BACM and MSM Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Construction Sites	1	Require Dust Suppression Control Before and After Creation of Disturbed Surfaces	50 Acre Construction Project	$9,381	0.10	$94,199
	2	Enhance Test Methods to Stabilize Inactive Disturbed Surface Areas	50 Acre Construction Project	$122,397	2.37	$51,612
	3	Enhance Test Methods to Include Additional Stabilization Requirements/Standards	50 Acre Construction Project	$122,397	2.37	$51,612
	4	Strengthen Visible Dust/Opacity Standards	50 Acre Construction Project	$122,397	2.37	$51,612
	5	Tighten Bulk Material Transport Dust Control Requirements	Individual Haul Truck	$0	0	$0
	6	Strengthen & Expand Trackout Dust Control Requirements	Public Access Point	$1,817	0.0026	$696,054
	7	Adopt Disturbed Soil, Staging, Unpaved Routes & Parking Area Dust Best Management Practices (BMPs)	5 Acre Construction Project	$2,550	0.89	$2,867
	8	Strengthen Soil Watering Requirement & Adopt Dust Palliative BMP	50 Acre Construction Project	$10,255	2.59	$3,960
	9	Adopt Demolition / Implosion Dust BMP	20 Acre Implosion Project	$43,262	4.78	$9,047
	10	Adopt Weed Abatement Dust Controls	5 Acre Weed Abatement Project	$2,064	0.018	$113,091
	11	Adopt Sand Blasting & Abrasive Blasting Dust BMPs	1 Acre Abrasive Blasting Site	$2,025	0.00011	$17,713,432
	12	Adopt Backfilling Dust Control BMP	500 Foot Trench Excavation	$5,341	0.016	$329,344
	13	Adopt Clearing & Grubbing Dust Control BMP	50 Acre Construction Project	$9,141	0.032	$284,975
	14	Adopt Foundation/Slab Form Clearing / Cleaning Dust BMP	50 Acre Construction Project	$211	0.0017	$124,600
	15	Adopt Crushing Operation Dust Control BMP	Misting Control System-Yr	$14,989	1.40	$10,706

Source Category	Measure Number	BACM and MSM Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Construction Sites	16	Adopt Cut & Fill Activity Dust Control BMP	50 Acre Construction Project	$43,733	2.59	$16,888
	17	Adopt Screening Operation Dust Control BMP	1000 Acre Construction Project	$14,989	0.83	$17,986
	18	Adopt Trenching Operation Dust Control BMP	500 Foot Trench Excavation	$5,341	0.016	$329,344
	19	Adopt Paving/Subgrade Operation Dust Control BMP	0.25 Mile Paving Project	$2,068	0.0082	$252,957
	20	Strengthen Dust Control Plan Requirements	5 Acre Project	$73,310	0.69	$105,549
	21	Strengthen Dust Control Recordkeeping Requirements	50 Acre Construction Project	$117,145	4.99	$23,462
	22	Strengthen Dust Control Coordinator Requirements	50 Acre Project	$141,410	3.18	$44,466
	23	Strengthen & Expand Dust Control Monitoring and Violation Requirements	5 Acre Construction Project	$180,967	0.48	$379,366
	24	Strengthen Project & Trenching Signage Requirements	1 Acre Project	$143	0.018	$8,037
	25	Adopt Dust Control Training Requirements for Project Coordinators and Foreman	12.3 Acre Construction Project	$165,842	1.08	$153,876
Cleared Areas	26	Strengthen Standards for Vacant Lot Size Threshold for Opacity and Stabilization Requirements	0.1 Acre Vacant Lot-Yr	$344 - $385	0.018	$18,725 - $20,918
	27	Strengthen Existing Vacant Lot Vehicle Use Requirements	0.1 Acre Vacant Lot-Yr	$344 - $364	0.018	$18,725 - $19,813
	28	Strengthen Existing Vacant Lot Fugitive Dust Controls	0.1 Acre Vacant Lot-Yr	$344 - $364	0.018	$18,725 - $19,813
	29	Require Mitigation Plans for Open Areas/Vacant Lots Over 10,000 Acres in Size	1 Acre Cleared Area-Yr	$0	0	$0
	30	Strengthen Weed Abatement Trash Removal Requirements for Open Areas/Vacant Lots	5,000 Sq Ft Cleared Area-Yr	$236 - $2,995	0.021 - 0.058	$11,479 - $51,549
Dairies	31	Tighten Definition of Dairies Subject to Fugitive Dust Rules	Dairy Farm	$0	0	$0

Source Category	Measure Number	BACM and MSM Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Dairies	32	Increase the Number of Dairy Operation Fugitive Dust BMPs	Dairy Farm	*Costs and benefits evaluated individually for Measures 33-36*		
	33	Increase the Number of Dairy Operation Fugitive Dust BMPs for Arenas, Corrals and Pens	Nonattainment Area-Yr	$3,861	27.57 - 54.35	$71 - $140
	34	Increase the Number of Dairy Operation Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Nonattainment Area-Yr	N/A	N/A	N/A
	35	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Access Connections	Nonattainment Area-Yr	$607	1.18 - 2.32	$261 - $515
	36	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Nonattainment Area-Yr	$1,492	2.48 - 4.89	$305 - $601
	37	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	1 Acre Area-Yr	$779	0.029	$26,707
Cattle CAFOs	38	Tighten Definition of Cattle Confined Animal Feeding Operations Subject to Fugitive Dust Rules	Cattle Feedlot	$0	0	$0
	39	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs	Cattle Feedlot	*Costs and benefits evaluated individually for Measures 40-43*		
	40	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Arenas, Corrals and Pens	Nonattainment Area-Yr	$54,420 - $217,680	65.04 - 128.21	$424 - $3,347
	41	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Nonattainment Area-Yr	N/A	N/A	N/A
Cattle CAFOs	42	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Access Connections	Nonattainment Area-Yr	$91,268	44.07 - 86.89	$1,050 - $2,071

Source Category	Measure Number	BACM and MSM Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
	43	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Nonattainment Area-Yr	$91,268	44.07 - 86.89	$1,050 - $2,071
	44	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	1 Acre Area-Yr	$779	0.029	$26,707
Agriculture	45	Increase the Number of BMPs to Control Fugitive Dust from Cropland Areas	Nonattainment Area-Yr	N/A	8.60 - 17.19	N/A
	46	Increase the Number of BMPs to Control Fugitive Dust on Noncropland Areas That Are Not Tied to High-Risk Days	Nonattainment Area-Yr	N/A	N/A	N/A
	47	Increase the Number of BMPs for the Control of Fugitive Dust from Commercial Farm Roads	Nonattainment Area-Yr	$353,408 - $1,277,048	375.96 - 896.98	$394 - $3,397
	48	Stabilization Requirements for Off-Field Bulk Material Storage	Nonattainment Area-Yr	N/A	N/A	N/A
	49	Fugitive Dust Controls for Off-Field Bulk Material Handling and Transport	Truck-Operating Day	$0	0	$0
	50	Increase the Minimum Number of Agricultural Earth Moving BMPs	Nonattainment Area-Yr	N/A	N/A	N/A
	51	Require Implementation of BMPs to Control Windblown Dust from Crop Operations on All Days	Nonattainment Area-Yr	$0	0	$0
Unpaved Roads	52	Expand Unpaved Road Definitions to Include Alleys	Centerline Mile-Yr	$20,157	3.27	$6,161
	53	Increase Average Daily Traffic (ADT) Thresholds for Unpaved Road Controls	Nonattainment Area-Yr	$1,357,569	4,428.91	$307
Unpaved Roads	54	Visible Emissions and Stabilization Requirements for Unpaved Roads	Nonattainment Area-Yr	$1,357,569	4,428.91	$307
	55	Increase Stringency of Unpaved Road Paving and Dust Stabilization Controls	Centerline Mile-Yr	$6,784 - $94,877	6.55 - 20.15	$1,036 - $4,709
	56	Expand Existing Reporting/Recordkeeping Requirements for Unpaved Roads	15 Centerline Miles	$146,463	0.45	$327,745

Source Category	Measure Number	BACM and MSM Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
	57	Explicit Dust Mitigation Controls for Off-Road Event Competitions on Unpaved Roads	Acre-Yr	$625	0.17	$3,625
Unpaved Lots	58	Add 0% Opacity at Property Line Provision to Unpaved Lot Requirements	50-Acre Area	$117,057	20.08	$5,829
	59	More Stringent Unpaved Lot Fugitive Dust Control Measures	Acre-Yr	$779	0.05 - 0.29	$2,671 - $15,481
	60	Prohibit Unpaved Lot/Storage Areas on Hydrographic Lands	Lot Acre-Yr	$16,994	2.71	$6,280
Paved Roads	61	Strengthen Stabilization Requirements for Unpaved Shoulders	Road Mile-Day	$50 - $134	0.00004 - 0.0016	$30,882 - $1,244,015
	62	Paving and/or Stabilization of Shoulders and Medians on New and Modified Paved Roads	Road Mile-Day	$50 - $134	0.00004 - 0.0016	$30,882 - $1,244,015
	63	Immediate Cleanup of Trackout, Carry Out & Spillage from Areas Accessible to the Public	Access Point-Yr	$2,274	0.020	$114,521
	64	Use of Only PM_{10}-Certified Street Sweepers to Clean Up Trackout Deposits on Paved Roads from Any Source	Centerline Mile-Yr	$14	0.40 - 1.52	$9 - $35
	65	Trackout Controls for Large Operations and Windy Conditions	Truck Operating Day	$0	0	$0
	66	Use of PM_{10}-Certified Street Sweepers on Freeways	Centerline Mile-Yr	$14	0.04 - 0.27	$51 - $340
	67	Use of PM_{10}-Certified Street Sweepers on Arterial Roads	Centerline Mile-Yr	$14	0.40 - 1.52	$9 - $35
Paved Roads	68	Require Use of Wetted Brushes and Blowers on Sweepers Used on Both Paved Roads and Parking Lots and Only Vacuum-Type Cleaning Equipment in Pavement Crack Sealing Applications	Road Mile-Yr	$0	0	$0
	69	Strengthen Existing Paved Road and Shoulder Standards Through Inclusion of Provisions Addressing Non-Conforming Roads and Shoulder Requirements	Road Mile-Yr	$784 - $18,363	0.01 - 0.59	$1,318 - $1,244,015

Source Category	Measure Number	BACM and MSM Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
	70	Strengthen Reporting and Recordkeeping Requirements to Include Street-Sweeping Extent and Frequency as Well as Dust Control Plans That Affect Trackout Compliance	50 Acre Project	$56,927	0.81	$69,980

Notes:

1) Rows with values of zero reflect measures for which emission reductions were determined to be negligible.
2) N/A - Not Available. Costs and cost-effectiveness could not be credibly quantified due to lack of available data.
3) These measures may or may not be feasible and available to the implementing entities.

SELECTION OF BACM MEASURES

EPA presented guidance on issues to be considered in selecting BACM for area sources in Serious PM-10 nonattainment areas in Subsection E of the 1994 Addendum to the General Preamble for Implementing Title I.[12] The guidance addresses the following requirements:

1. Selection from Candidate BACM Listed in EPA Technical Information Documents
2. Consideration of Control Measures Raised During the Public Comment Period
3. Issues to be Considered in the Selection of BACM
4. Adoption of Increasingly Stringent Control Measures

Of these issues, Requirements 1 and 3 have been extensively reviewed in the earlier discussion of BACM evaluation procedures. Regarding Requirement 2, several public meetings of the MAG Air Quality Technical Advisory Committee were held that discussed BACM requirements and the development of candidate BACM (see Chapter 10) where input from the Committee and the public was considered. As discussed in Chapter 6, the Suggested List of Measures were on the public agendas for the MAG Air Quality Technical Advisory Committee, the MAG Management Committee, and the MAG Regional Council. Any public comments regarding BACM raised during the public comment period will be reviewed and responded to as well.

The remainder of this analysis focuses on Requirement 4 – Adoption of Increasingly Stringent Controls. As explained earlier, of 115 initially evaluated measure/provisions, 27 were rejected because they were equal or less stringent than measures currently implemented in the West Pinal County nonattainment area, 15 were eliminated due to lack of applicability in the nonattainment area and three were logically grouped with other measures/provisions, resulting in a total of 70 recommended control measures that meet BACM stringency requirements.

A consultant report was prepared for these 70 recommended BACM-level measures that included the following information:

- A review of existing applicable PM_{10} regulations;
- A review of fugitive dust regulations in other PM_{10} nonattainment areas;
- Suggested implementing agency;
- Analysis unit;
- Key analysis assumptions;
- An estimate of the cost of implementation;
- An estimate of the PM_{10} emission reduction potential; and
- An estimate of the cost effectiveness ($/ton of PM_{10} reduced).

Beyond the PM-10 emissions reductions and costs that were summarized in Table 5-7,

[12] *ibid.*

the report also discusses technological and economic feasibility where applicable. The report is provided in Appendix C, Exhibit 3.

The 70 measures included in the report were all determined to be more stringent than existing measures, supporting the BACM selection requirement to adopt increasingly stringent control measures within the nonattainment area. Commitments have been included in the 2022 Serious Area Particulate Plan for PM-10 which support all but nine of the 70 PM-10 control measures contained in the report (Chapter 7). As part of their commitments, the implementing entities have provided implementation schedules that ensure all BACM will be implemented before the statutory deadline of July 24, 2024. The reasoned justification for non-implementation of the nine suggested measures not committed to is described in Chapter 7.

SUMMARY

The information presented above provides a review of the guidance developed by EPA to aid states in demonstrating that selected control measures constitute BACM and documents the process that has been followed in complying with that guidance. Key elements of that guidance include Procedures to Determine BACM and the Selection of BACM for Area Sources.

Regarding the Procedures for Determining BACM, the information presented above clearly demonstrates compliance with each of the following procedures:

1. Inventory Sources of PM-10 and PM-10 Precursors
2. Evaluate Source Category Impact
3. Evaluate Alternative Control Techniques
4. Evaluate Costs of Control

While the guidance on the selection of BACM did not specifically identify procedures to be followed, it did identify a series of issues to be considered. A review of that guidance, presented earlier in this chapter, detailed the following steps:

1. Selection from Candidate BACM Listed in EPA Technical Information Documents
2. Consideration of Control Measures Raised During the Public Comment Period
3. Issues to be Considered in the Selection of BACM
4. Adoption of Increasingly Stringent Control Measures

The information presented in this Chapter demonstrates that the EPA guidance for determining and selecting BACM was fulfilled and resulted in the 70 measures ultimately identified as candidate BACM and included in the Suggested List of Measures for consideration by implementing entities (Chapter 6). Commitments to implement the identified BACM received by the implementing entities ensure that BACM will be in place within the nonattainment area by July 24, 2024.

6. SUGGESTED MEASURES FOR THE PLAN

This Chapter discusses the development of the Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area. The Suggested List of Measures is an important part of the process used to meet Best Available Control Measures and Most Stringent Measures requirements. Following the approval of the Suggested List of Measures by the MAG Regional Council, the measures are then considered for implementation by the implementing entities.

The extensive planning process that was used to develop this plan involved the thorough review of pertinent air quality information by the MAG Air Quality Technical Advisory Committee. The information included: requirements in the Clean Air Act, emission inventories which identify the PM-10 emissions sources; air quality monitoring data; air quality modeling data; and descriptions and assumptions associated with the air quality control measures. The committees also reviewed information on the cost effectiveness of the air quality control measures.

The committed control measures included in this plan must meet Best Available Control Measure requirements as specified by Clean Air Act Section 189(b)(1)(B). Additionally, because a request for an extension of the attainment date is included in this plan, the committed control measures included in the plan must also be considered as Most Stringent Measures as required by Clean Air Act Section 188(e). As discussed in Chapters 4 and 5, Trinity Consultants identified all available Best Available Control Measures and Most Stringent Measures for significant PM-10 emissions sources by comparing existing measures within the West Pinal County PM-10 Nonattainment Area to existing measures in place in ten Serious PM-10 nonattainment areas and PM-10 maintenance areas that were formerly classified as Serious. Based upon the Trinity Consultants report, 70 candidate measures were evaluated. The 70 measures were evaluated to determine the PM-10 emissions reductions and the technological and economic feasibility associated with implementation of each measure.

The 70 measures in the report have been included in the Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area. Each implementing entity determines which measures are available and feasible for implementation by that entity. For the West Pinal County PM-10 Nonattainment Area, the implementing entities are the Pinal County Air Quality Control District and the Governor's Agricultural Best Management Practices Committee.

Following the consideration of the various types of information discussed above, the MAG Air Quality Technical Advisory Committee began their deliberation to recommend a Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area. The Suggested List of Measures was approved by the MAG Regional Council on May 26, 2021.

MAG AIR QUALITY TECHNICAL ADVISORY COMMITTEE AND MAG MANAGEMENT COMMITTEE RECOMMENDATION FOR THE SUGGESTED LIST OF MEASURES

The process used to develop the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area included numerous meetings of the MAG Air Quality Technical Advisory Committee. From May 2020 through March 2022, the MAG Air Quality Technical Advisory Committee reviewed an extensive body of information related to the development of the plan. The information included: Clean Air Act requirements for the 2022 Serious Area PM-10 Plan; air quality monitoring data; evaluation of PM-10 precursor pollutants; 2017 base year PM-10 emissions inventory; Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area report; attainment modeling approach for the 2022 Serious Area PM-10 Plan, evaluation of contingency measures, and the estimated impacts of the measures for reducing PM-10 emissions and modeling attainment throughout the nonattainment area.

On April 22, 2021, the MAG Air Quality Technical Advisory Committee met and reviewed the entire Draft Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area. The Committee also reviewed the March 31, 2021 Trinity Consultant Report Final Report, “Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area” upon which the Draft Suggested List of Measures is based.

After review and discussion, on April 22, 2021, the MAG Air Quality Technical Advisory Committee recommended approval of the Draft Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area to the MAG Management Committee. On May 12, 2021, the MAG Management Committee recommended approval of the Draft Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area to the MAG Regional Council.

MAG REGIONAL COUNCIL APPROVAL OF THE SUGGESTED LIST OF MEASURES

On May 26, 2021, the MAG Regional Council approved the Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area. Each implementing entity determines which measures are available and feasible for implementation by that entity. For the West Pinal County PM-10 Nonattainment Area, the implementing entities are the Pinal County Air Quality Control District and the Governor’s Agricultural Best Management Practices Committee. The Suggested List of Measures is provided in Table 6-1.

Approved by the
MAG Regional Council on
May 26, 2021

Table 6-1
Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County PM-10 Nonattainment Area

These measures may or may not be feasible and available to the implementing entities

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Construction Sites	1	Require Dust Suppression Control Before and After Creation of Disturbed Surfaces	50 Acre Construction Project	$9,381	0.10	$94,199
Construction Sites	2	Enhance Test Methods to Stabilize Inactive Disturbed Surface Areas	50 Acre Construction Project	$122,397	2.37	$51,612
Construction Sites	3	Enhance Test Methods to Include Additional Stabilization Requirements/Standards	50 Acre Construction Project	$122,397	2.37	$51,612
Construction Sites	4	Strengthen Visible Dust/Opacity Standards	50 Acre Construction Project	$122,397	2.37	$51,612
Construction Sites	5	Tighten Bulk Material Transport Dust Control Requirements	Individual Haul Truck	$0	0	$0
Construction Sites	6	Strengthen & Expand Trackout Dust Control Requirements	Public Access Point	$1,817	0.0026	$696,054
Construction Sites	7	Adopt Disturbed Soil, Staging, Unpaved Routes & Parking Area Dust Best Management Practices (BMPs)	5 Acre Construction Project	$2,550	0.89	$2,867

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Construction Sites	8	Strengthen Soil Watering Requirement & Adopt Dust Palliative BMP	50 Acre Construction Project	$10,255	2.59	$3,960
Construction Sites	9	Adopt Demolition / Implosion Dust BMP	20 Acre Implosion Project	$43,262	4.78	$9,047
Construction Sites	10	Adopt Weed Abatement Dust Controls	5 Acre Weed Abatement Project	$2,064	0.018	$113,091
Construction Sites	11	Adopt Sand Blasting & Abrasive Blasting Dust BMPs	1 Acre Abrasive Blasting Site	$2,025	0.00011	$17,713,432
Construction Sites	12	Adopt Backfilling Dust Control BMP	500 Foot Trench Excavation	$5,341	0.016	$329,344
Construction Sites	13	Adopt Clearing & Grubbing Dust Control BMP	50 Acre Construction Project	$9,141	0.032	$284,975
Construction Sites	14	Adopt Foundation/Slab Form Clearing / Cleaning Dust BMP	50 Acre Construction Project	$211	0.0017	$124,600
Construction Sites	15	Adopt Crushing Operation Dust Control BMP	Misting Control System-Yr	$14,989	1.40	$10,706
Construction Sites	16	Adopt Cut & Fill Activity Dust Control BMP	50 Acre Construction Project	$43,733	2.59	$16,888
Construction Sites	17	Adopt Screening Operation Dust Control BMP	1000 Acre Construction Project	$14,989	0.83	$17,986
Construction Sites	18	Adopt Trenching Operation Dust Control BMP	500 Foot Trench Excavation	$5,341	0.016	$329,344
Construction Sites	19	Adopt Paving/Subgrade Operation Dust Control BMP	0.25 Mile Paving Project	$2,068	0.0082	$252,957

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Construction Sites	20	Strengthen Dust Control Plan Requirements	5 Acre Project	$73,310	0.69	$105,549
Construction Sites	21	Strengthen Dust Control Recordkeeping Requirements	50 Acre Construction Project	$117,145	4.99	$23,462
Construction Sites	22	Strengthen Dust Control Coordinator Requirements	50 Acre Project	$141,410	3.18	$44,466
Construction Sites	23	Strengthen & Expand Dust Control Monitoring and Violation Requirements	5 Acre Construction Project	$180,967	0.48	$379,366
Construction Sites	24	Strengthen Project & Trenching Signage Requirements	1 Acre Project	$143	0.018	$8,037
Construction Sites	25	Adopt Dust Control Training Requirements for Project Coordinators and Foreman	12.3 Acre Construction Project	$165,842	1.08	$153,876
Cleared Areas	26	Strengthen Standards for Vacant Lot Size Threshold for Opacity and Stabilization Requirements	0.1 Acre Vacant Lot-Yr	$344 - $385	0.018	$18,725 - $20,918
Cleared Areas	27	Strengthen Existing Vacant Lot Vehicle Use Requirements	0.1 Acre Vacant Lot-Yr	$344 - $364	0.018	$18,725 - $19,813
Cleared Areas	28	Strengthen Existing Vacant Lot Fugitive Dust Controls	0.1 Acre Vacant Lot-Yr	$344 - $364	0.018	$18,725 - $19,813
Cleared Areas	29	Require Mitigation Plans for Open Areas/Vacant Lots Over 10,000 Acres in Size	1 Acre Cleared Area-Yr	$0	0	$0

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Cleared Areas	30	Strengthen Weed Abatement Trash Removal Requirements for Open Areas/Vacant Lots	5,000 Sq Ft Cleared Area-Yr	$236 - $2,995	0.021 - 0.058	$11,479 - $51,549
Dairies	31	Tighten Definition of Dairies Subject to Fugitive Dust Rules	Dairy Farm	$0	0	$0
Dairies	32	Increase the Number of Dairy Operation Fugitive Dust BMPs	Dairy Farm	*Costs and benefits evaluated individually for Measures 33-36*		
Dairies	33	Increase the Number of Dairy Operation Fugitive Dust BMPs for Arenas, Corrals and Pens	Nonattainment Area-Yr	$3,861	27.57 - 54.35	$71 - $140
Dairies	34	Increase the Number of Dairy Operation Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Nonattainment Area-Yr	N/A	N/A	N/A
Dairies	35	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Access Connections	Nonattainment Area-Yr	$607	1.18 - 2.32	$261 - $515
Dairies	36	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Nonattainment Area-Yr	$1,492	2.48 - 4.89	$305 - $601
Dairies	37	Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	1 Acre Area-Yr	$779	0.029	$26,707

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Cattle CAFOs	38	Tighten Definition of Cattle Confined Animal Feeding Operations Subject to Fugitive Dust Rules	Cattle Feedlot	$0	0	$0
Cattle CAFOs	39	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs	Cattle Feedlot	*Costs and benefits evaluated individually for Measures 40-43*		
Cattle CAFOs	40	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Arenas, Corrals and Pens	Nonattainment Area-Yr	$54,420 - $217,680	65.04 - 128.21	$424 - $3,347
Cattle CAFOs	41	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting	Nonattainment Area-Yr	N/A	N/A	N/A
Cattle CAFOs	42	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Access Connections	Nonattainment Area-Yr	$91,268	44.07 - 86.89	$1,050 - $2,071
Cattle CAFOs	43	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Roads or Feed Lanes	Nonattainment Area-Yr	$91,268	44.07 - 86.89	$1,050 - $2,071
Cattle CAFOs	44	Increase the Number of Cattle Confined Animal Feeding Operations Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas	1 Acre Area-Yr	$779	0.029	$26,707

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Agriculture (Cropland)	45	Increase the Number of BMPs to Control Fugitive Dust from Cropland Areas	Nonattainment Area-Yr	N/A	8.60 - 17.19	N/A
Agriculture (Cropland)	46	Increase the Number of BMPs to Control Fugitive Dust on Noncropland Areas That Are Not Tied to High-Risk Days	Nonattainment Area-Yr	N/A	N/A	N/A
Agriculture (Cropland)	47	Increase the Number of BMPs for the Control of Fugitive Dust from Commercial Farm Roads	Nonattainment Area-Yr	$353,408 - $1,277,048	375.96 - 896.98	$394 - $3,397
Agriculture (Cropland)	48	Stabilization Requirements for Off-Field Bulk Material Storage	Nonattainment Area-Yr	N/A	N/A	N/A
Agriculture (Cropland)	49	Fugitive Dust Controls for Off-Field Bulk Material Handling and Transport	Truck-Operating Day	$0	0	$0
Agriculture (Cropland)	50	Increase the Minimum Number of Agricultural Earth Moving BMPs	Nonattainment Area-Yr	N/A	N/A	N/A
Agriculture (Cropland)	51	Require Implementation of BMPs to Control Windblown Dust from Crop Operations on All Days	Nonattainment Area-Yr	$0	0	$0
Unpaved Roads	52	Expand Unpaved Road Definitions to Include Alleys	Centerline Mile-Yr	$20,157	3.27	$6,161
Unpaved Roads	53	Increase Average Daily Traffic (ADT) Thresholds for Unpaved Road Controls	Nonattainment Area-Yr	$1,357,569	4,428.91	$307
Unpaved Roads	54	Visible Emissions and Stabilization Requirements for Unpaved Roads	Nonattainment Area-Yr	$1,357,569	4,428.91	$307

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Unpaved Roads	55	Increase Stringency of Unpaved Road Paving and Dust Stabilization Controls	Centerline Mile-Yr	$6,784 - $94,877	6.55 - 20.15	$1,036 - $4,709
Unpaved Roads	56	Expand Existing Reporting/Recordkeeping Requirements for Unpaved Roads	15 Centerline Miles	$146,463	0.45	$327,745
Unpaved Roads	57	Explicit Dust Mitigation Controls for Off-Road Event Competitions on Unpaved Roads	Acre-Yr	$625	0.17	$3,625
Unpaved Lots	58	Add 0% Opacity at Property Line Provision to Unpaved Lot Requirements	50-Acre Area	$117,057	20.08	$5,829
Unpaved Lots	59	More Stringent Unpaved Lot Fugitive Dust Control Measures	Acre-Yr	$779	0.05 - 0.29	$2,671 - $15,481
Unpaved Lots	60	Prohibit Unpaved Lot/Storage Areas on Hydrographic Lands	Lot Acre-Yr	$16,994	2.71	$6,280
Paved Roads	61	Strengthen Stabilization Requirements for Unpaved Shoulders	Road Mile-Day	$50 - $134	0.00004 - 0.0016	$30,882 - $1,244,015
Paved Roads	62	Paving and/or Stabilization of Shoulders and Medians on New and Modified Paved Roads	Road Mile-Day	$50 - $134	0.00004 - 0.0016	$30,882 - $1,244,015
Paved Roads	63	Immediate Cleanup of Trackout, Carry Out & Spillage from Areas Accessible to the Public	Access Point-Yr	$2,274	0.020	$114,521

Source Category	Measure Number	Measure Title	Analysis Unit	Cost ($)	Emission Reductions (ton PM_{10})	Cost-Effectiveness ($/ton PM_{10})
Paved Roads	64	Use of Only PM_{10}-Certified Street Sweepers to Clean Up Trackout Deposits on Paved Roads from Any Source	Centerline Mile-Yr	$14	0.40 - 1.52	$9 - $35
Paved Roads	65	Trackout Controls for Large Operations and Windy Conditions	Truck Operating Day	$0	0	$0
Paved Roads	66	Use of PM_{10}-Certified Street Sweepers on Freeways	Centerline Mile-Yr	$14	0.04 - 0.27	$51 - $340
Paved Roads	67	Use of PM_{10}-Certified Street Sweepers on Arterial Roads	Centerline Mile-Yr	$14	0.40 - 1.52	$9 - $35
Paved Roads	68	Require Use of Wetted Brushes and Blowers on Sweepers Used on Both Paved Roads and Parking Lots and Only Vacuum-Type Cleaning Equipment in Pavement Crack Sealing Applications	Road Mile-Yr	$0	0	$0
Paved Roads	69	Strengthen Existing Paved Road and Shoulder Standards Through Inclusion of Provisions Addressing Non-Conforming Roads and Shoulder Requirements	Road Mile-Yr	$784 - $18,363	0.01 - 0.59	$1,318 - $1,244,015
Paved Roads	70	Strengthen Reporting and Recordkeeping Requirements to Include Street-Sweeping Extent and Frequency as Well as Dust Control Plans That Affect Trackout Compliance	50 Acre Project	$56,927	0.81	$69,980

THE NEXT STEP IN THE PROCESS

After the Suggested List of Measures for Reducing PM-10 Particulate Pollution in the West Pinal County Nonattainment Area was approved by the Regional Council, the next step in the planning process involved the consideration of the measures by the appropriate implementing entities. Commitments to implement measures from the implementing entities are then reviewed to determine which measures received firm commitments for inclusion in the Adopted Plan.

7. THE ADOPTED PLAN

This Chapter discusses the Adopted Plan and Implementation Schedule. During the process of developing this plan, implementing entities reviewed the measures from the Suggested List of Measures to Reduce PM-10 Particulate Matter which were under their respective authorities. Each entity then determined which measures were technologically and economically feasible for implementation by that entity.

Formal resolutions with commitments to implement PM-10 particulate pollution control measures were received from the Governor's Agricultural Best Management Practices Committee and the Pinal County Board of Supervisors. The resolutions noted that Best Available Control Measures and Most Stringent Measures are required to be included in the 2022 Serious Area Particulate Plan for PM-10.

These resolutions were reviewed in order to determine which measures received firm commitments for inclusion in the 2022 Serious Area Particulate Plan for PM-10. According to the Arizona Department of Environmental Quality (ADEQ), the criteria for a firm commitment include: measures with the implementation, funding, and time frame specified; ongoing programs; commitments to draft documents; and commitments to conduct feasibility studies. Jurisdictional support for a measure is not a firm commitment unless the jurisdiction also agrees to enforce the measure. Measures were also analyzed by MAG to determine which measures could be used for numeric credit towards the attainment demonstration.

Collectively, a broad range of commitments were received from Governor's Agricultural Best Management Practices Committee and the Pinal County Board of Supervisors for inclusion in the adopted plan. The commitments include measures to control PM-10 emissions for all significant sources of PM-10 within the nonattainment area. These extensive commitments demonstrate the level of effort that is being made to improve air quality. The resolutions from the respective entities and the corresponding commitment documents which accompany this plan are discussed in Chapter Eleven.

Several of these measures were quantified to reflect their impact in reducing PM-10 emissions and attaining the standard as expeditiously as practicable. However, in some cases, specific emissions reduction credits were not taken for measures where the basis of estimating air quality benefits was limited. It is important to note that the commitments not quantified will produce emission reductions above and beyond what has been quantified in the evaluation. These measures represent additional efforts to reduce emissions and improve air quality. It is anticipated that as additional experience is gained in the implementation of these measures over time, a more detailed assessment of their air quality benefits may be developed and reported.

The PM-10 attainment date for the West Pinal County nonattainment area is December 31, 2022. If the requested extension of the attainment date is granted (see Chapter 9), the attainment date would be December 31, 2026. The effective implementation,

compliance and enforcement of the measures in the adopted plan are critical for air quality improvement and attaining the standard as expeditiously as practicable

COMMITTED MEASURES AND IMPLEMENTATION SCHEDULES

Based upon the commitments made by the Governor's Agricultural Best Management Practices Committee and the Pinal County Board of Supervisors, the following describes the measures in the adopted plan and their schedule for implementation. The commitments to implement measures are organized by how they relate to the Suggested List of Measures included in Chapter 6. A total of 61 of the 70 suggested measures received commitments. A summary listing of the committed measures is included in Table 7-1. A narrative description of each committed measure is included below.

Table 7-1
Committed Measures for the 2022 Serious Area Particulate Plan for PM-10

Suggested Measure #	Emission Source Category	Implementing Entity Committed Measure
1-10, 12-14, 16, 18-25	Construction Sites	Pinal County Measure 1 – Construction Fugitive Dust Sources
26-28, 30	Cleared Areas	Pinal County Measure 2 – Open Areas/Vacant Lot Fugitive Dust Sources
31-37	Dairies	Governor's Agricultural BMP Committee – Dairy Measures 31-37
38-44	Cattle CAFOs	Governor's Agricultural BMP Committee – Cattle CAFO Measures 38-44
45-47, 50-51	Agricultural (Cropland)	Governor's Agricultural BMP Committee – Agricultural Cropland Measures 45-47, 50-51
52-56	Unpaved Roads	Pinal County Measure 3 – Unpaved Roads
58-59	Unpaved Lots	Pinal County Measure 4 – Unpaved Lots
61-67, 69-70	Paved Roads	Pinal County Measure 5 – Paved Roads

Pinal County Measure 1 – Construction Fugitive Dust Sources

As part of their commitments, the Pinal County Air Quality Control District (PCAQCD) grouped 22 of the 25 suggested measures related to PM-10 emissions from construction sites into Pinal County Measure 1. PCAQCD indicated in their commitments that they will replace the existing West Pinal County construction fugitive dust rules (Chapter 4, Article 3) with similarly stringent rules to the Apache Junction Serious PM-10 nonattainment area construction fugitive dust rules (Chapter 4, Article 7 - including but not limited to §§ 4-7-214, 4-7-218, 4-7-222, 4-7-226 and 4-7-230, 4-7-234, 4-7-238, 4-7-242 and 4-7-246) which align to suggested measures 1,2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 24, 25. Additionally, when applicable, PCAQCD will adopt rule provisions and language that are equal to, or as stringent as, the suggested measures referenced.

PCAQCD has also indicated in their commitments that the Pinal County Board of Supervisors is authorized by A.R.S. § 49-479 to adopt rules for air pollution control and by A.R.S. § 49-480 to establish, administer and enforce a program for air quality permits. The Board adopted rules establishing air quality permit program and pursuant to A.R.S. § 49-473, designated the Air Quality Control District to issue permits and administer and enforce the permit program. By operation of A.R.S. § 49-471, the executive head of the department designated under A.R.S. § 49-473 serves as the Air Pollution Control Officer. The Air Pollution Control Officer is specifically authorized to take the enforcement actions set forth in A.R.S. §§ 49-502, 49-511, 49-512 and 49-513.

In regard to personnel and funding for Pinal County Measure 1, PCAQCD indicated that no change in level of personnel or funding is anticipated for rule development activities. The PCAQCD Compliance Division inspects and determines compliance at fugitive dust sources. Currently the Dust Compliance/Enforcement Division has 1 manager and 2 fugitive dust air quality inspectors. Additionally industrial sources (and their associated open areas, unpaved parking lots, etc.) are covered under the Permitting Division which has 1 dedicated inspector.

PCAQCD will seek approval to hire 1 or more fugitive dust air quality staff to assist with inspections associated with Pinal County Measures 1-5. PCAQCD will evaluate revenues and expenditures anticipated to meet the committed Measures 1-5 and may propose an increase in fees or additional resources by January 2023/2024, if necessary. PCAQCD's revenue is approximately $1,898,178. Annual costs associated with increased personnel are the following: Additional dust control staff = $150,000.

The implementation schedule provided by PCAQCD in their commitments under Pinal County Measure 1 is as follows:

January, 2022 – March, 2023:	Draft rule revisions proposal and conduct stakeholder workshops
April, 2023:	Oral proceeding on rule revisions proposal

May/June, 2023	Board consideration of rule revisions proposal
June, 2023 – January, 2024	Hire an additional compliance inspector

Regarding enforcement and monitoring programs for Pinal County Measure 1, PCAQCD indicated in their commitments that measure requirements are administered through a visual inspection program and a permit program which includes review of permits, inspection of facilities, performance of compliance test methods, and review of records and activities. PCAQCD's enforcement options include orders of abatement, civil actions for injunctive relief or civil penalties, and filing a class 1 misdemeanor citation.

PCAQCD tracks the number of permits and inspections; the number of enforcement actions; amount of penalties assessed; and compliance with the 24-hour PM-10 standard. The Department will continue to track this information and will perform a rule effectiveness study in 2024 to evaluate compliance with Pinal County Measure 1.

Narrative descriptions of the suggested measures included in Pinal County Measure 1 are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Require Dust Suppression Control Before and After Creation of Disturbed Surfaces (Suggested Measure #1)

Implementation of this measure will include the adoption of regulations governing dust control before or after activity has ceased on disturbed surfaces at construction sites. Main requirements include:

- Pre-watering and phased work to minimize dust before disturbed surfaces are created.
- Application of one or more appropriate controls (e.g., paving, watering, graveling, dust suppression, establishing vegetation cover, etc.) within 10 days of completing dust generating activities.
- Restricting access through the establishment of fences, barriers, etc. to curtail trespass.

Enhance Test Methods to Stabilize Inactive Disturbed Surface Areas (Suggested Measure #2)

Implementation of this measure will include the adoption of regulations, standards and test methods for establishing specific soil stabilizing limitations for inactive and post-operation open areas and lots which vehicles are operated on that include:

- Soil crust; or
- Threshold friction velocity (TFV) corrected for non-erodible elements of 100 cm/second or higher; or
- Flat vegetative cover, not subject to movement by wind that is equal to at least 50%; or
- Standing vegetative cover that is equal to or greater than 30%; or
- Standing vegetative cover that is equal to or greater than 10% and where the threshold friction velocity is equal to or greater than 43 cm/second when corrected for non-erodible elements; or
- A percent cover that is equal to or greater than 10% for non-erodible elements; or
- An alternative test method approved in writing by the Control Officer and the Administrator.

Enhance Test Methods to Include Additional Stabilization Requirements/Standards (Suggested Measure #3)

Implementation of this measure will include the adoption of regulations, standards and test methods for establishing specific soil stabilizing limitations for specific active areas that include:

- Unpaved Parking Lots - The owner and/or operator of any unpaved parking lot shall not allow visible fugitive dust emissions to exceed 20% opacity and shall not allow silt loading equal to or greater than 0.33 oz./ft^2. However, if silt loading is equal to or greater than 0.33 oz./ft^2, then the owner and/or operator shall not allow the silt content to exceed 8%.
- Unpaved Haul/Access Road – The owner and/or operator of any unpaved haul/access road (whether at a work site that is under construction or at a work site that is temporarily or permanently inactive) shall not allow visible fugitive dust emissions to exceed 20% opacity and shall not allow silt loading equal to or greater than 0.33 oz./ft^2. However, if silt loading is equal to or greater than 0.33 oz./ft^2, then the owner and/or operator shall not allow the silt content to exceed 6%.
- Disturbed Surfaces – noted above in Suggested Measure #2.

Strengthen Visible Dust/Opacity Standards (Suggested Measure #4)

Implementation of this measure will include the adoption of visible emissions regulations and standards for dust control plans on high wind days. The visible emissions requirements for dust generating operations require that an owner/operator shall not:

- Cause or allow visible fugitive dust emissions to exceed 20% opacity.
- Cause or allow visible emissions of particulate matter, including fugitive dust, beyond the property line within which the emissions are generated.

Tighten Bulk Material Transport Dust Control Requirements (Suggested Measure #5)

Implementation of this measure will include the adoption of regulations specific to fugitive dust controls for bulk material transport operations (loading, unloading, conveying, transporting, piling, etc). Main adopted regulations include:

- Freeboard limit of six inches.
- Regular inspection of belly-dump truck seals and the removal of trapped rocks.

Strengthen and Expand Trackout Dust Control Requirements (Suggested Measure #6)

Implementation of this measure will include strengthened regulations specific to when trackout control is required. The main requirements for trackout control will be triggered for worksites with a disturbed surface area of two acres or more. These work sites shall install, maintain, and use trackout devices that remove particulate matter from tires and exterior surfaces of haul trucks and/or motor vehicles that traverse the site at all exits onto areas accessible to the public

Adopt Disturbed Soil, Staging, Unpaved Routes and Parking Area Dust Best Management Practices (BMPs) (Suggested Measure #7)

Implementation of this measure will include the adoption of regulation that include best management practices (BMPs) for disturbed soil, staging areas, and vehicular operations. Main elements of the Disturbed Soil BMP include:

- For each non-linear project to be permitted for 5 acres or less; install perimeter wind barrier 3 feet or more in height made of material with a porosity of 50% or less.
- Limit vehicle traffic and disturbance of soils where possible. Palliative requirements are a function of the soil type (i.e., particulate emission potential (PEP)).
- Limit vehicle traffic and disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.
- Stabilize and maintain stability of all disturbed soil throughout construction site.

Main elements of the Staging Areas BMP include:

- Limit vehicle speeds to 15 mph in the staging area and on all unpaved access routes.
- Apply and maintain dust suppressant on all vehicle traffic areas in the staging areas and unpaved access routes.
- Stabilize staging area soils during use.
- Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- Apply and maintain a dust palliative to surface soils where support equipment and vehicles will be operated.
- Stabilize staging area soils at project completion.

Main elements of the Unpaved Routes and Parking Areas BMP include:

- Stabilize staging area soils at project completion,
- Limit vehicle speeds to 15 mph on all unpaved routes, and
- Stabilize haul routes and off-road parking areas.

Strengthen Soil Watering Requirements and Adopt Dust Palliative BMP (Suggested Measure #8)

Implementation of this measure will include strengthening regulations that require watering (pre-wetting and during active operations) to increase the moisture content of the soil. Main strengthened regulations include the implementation of all dust control measures necessary to maintain soil stability 24 hours a day, seven days a week until the permit is closed. Additional, more stringent watering requirements are mandated when wind conditions cause fugitive dust emissions to exceed 20% opacity. Measures to be implemented set BMP requirements for palliative use in traffic and non-traffic applications, application rates, record keeping, etc. The BMP also establishes soil stabilization requirements for different soil categories with application rates and suppressant use increasing with particulate emission potential (PEP).

Adopt Demolition/Implosion Dust BMP (Suggested Measure #9)

Implementation of this measure will include the adoption of regulations specific to demolition and implosion activities. Main requirements for implosion activities include:

- Confining blasting to times when wind direction is away from closest residential areas, occupied buildings, and major roadways.
- Stabilizing surface area where support equipment and vehicles will be operated.

- Stabilizing demolition debris immediately following blast and safety clearance.

Main requirements of demolition activities include:

- Stabilizing surface soils where support equipment and vehicles will operate.
- Stabilizing demolition debris during handling.
- Stabilizing debris following demolition.
- Stabilizing surrounding area following demolition.

Adopt Weed Abatement Dust Controls (Suggested Measure #10)

Implementation of this measure will include the adoption of regulations specific to a dust generating operation that involves weed abatement by discing or blading. Main requirements include:

- Before weed abatement by discing or blading occurs, apply water;
- While weed abatement by discing or blading is occurring, apply water; and
- After weed abatement by discing or blading occurs, pave, apply gravel, apply water, apply a suitable dust suppressant other than water, or establish vegetative ground cover.

Adopt Backfilling Dust Control BMP (Suggested Measure #12)

Implementation of this measure will include the adoption of regulations specific to backfilling operations. Main BMP requirements include:

- Stabilize backfill material when not actively handling.
- Stabilize backfill material during handling. The requirements for backfilling depend on the soil type.
- Stabilize soil at completion of backfilling activity.
- Stabilize material while using pipe padder equipment.

Adopt Clearing and Grubbing Dust Control BMP (Suggested Measure #13)

Implementation of this measure will include the adoption of regulations specific to clearing and grubbing operations. Main BMP requirements include:

- Stabilize surface soils where support equipment and vehicles will operate.
- Stabilize soil during clearing and grubbing activities. The requirements for these activities depend on the soil type.

- Stabilize disturbed soil immediately after clearing and grubbing activities.

It is recommended that live perennial vegetation and desert pavement be maintained where possible.

Adopt Foundation/Slab Form Clearing/Cleaning Dust BMP (Suggested Measure #14)

Implementation of this measure will include the adoption of regulations specific to clearing for, and cleaning of, forms used for foundations and slabs. Main requirements include limiting visible emissions to no more than an average of 20% opacity for any period aggregating 3 minutes in any 60-minute period. Specific BMP controls include use of single stage pours unless prohibited by engineering design or building code, to minimize clearing and the use of one of the following:

- Water spray to clear forms, foundations, and slabs.
- Sweeping and water spray to clear forms, foundations, and slabs.
- Industrial vacuum to clear forms, foundations, and slabs prior to the use of high-pressure air to blow soil and debris.
- Industrial vacuum to clear forms, foundations, and slabs.

Adopt Cut and Fill Activity Dust Control BMP (Suggested Measure #16)

Implementation of this measure will include the adoption of regulations specific to cut and fill activities. Main BMP requirements include:

- Stabilize surface soils where support equipment and vehicles will operate.
- Pre-water soils. Dig a hole to depth of the cut or equipment penetration to determine if soils are moist and apply controls depending on the soil type particulate emission potential (PEP).
- Stabilize soil during cut activities.
- Stabilize soil after cut and fill activities.

Adopt Trenching Operation Dust Control BMP (Suggested Measure #18)

Implementation of this measure will include the adoption of regulations specific to trenching activities. Main BMP requirements include:

- Stabilize surface soils where trenching equipment, support equipment and vehicles will operate.
- Presoak soils prior to trenching activities. Specific controls depend on the particulate emission potential (PEP) of the soil type.

- Stabilize soil during trenching activities. Again, specific controls depend on the PEP of the soil type.
- Stabilize soils at the completion of trenching activities.

It is recommended that mud and soil be washed from equipment at completion of each trench to prevent crusting and drying of soil on equipment.

Adopt Paving/Subgrade Operation Dust Control BMP (Suggested Measure #19)

Implementation of this measure will include the adoption of regulations specific to paving/subgrade preparation activities. Main BMP requirements include:

- Stabilize soils prior to activities.
- Stabilize soils following activities.
- Stabilize adjacent disturbed soils following paving activities.

Strengthen Dust Control Plan Requirements (Suggested Measure #20)

Implementation of this measure will include the adoption of regulations that strengthen dust control plan requirements. Main requirements include:

- No person shall commence construction of, operate, or make a modification to any dust-generating operation when such dust-generating operations disturb a total surface area of 0.10 acre (4,356 square feet) or more without first obtaining a permit or permit revision from the Control Officer.
- A requirement to include a project site drawing and, if the site is one acre or larger, soil designations; and
- The permittee is responsible for ensuring that all persons abide by conditions of the dust control permit, supply copies to all project contractors and subcontractors and accept responsibility for meeting the conditions of the Dust Control permit and for ensuring that control measures are implemented throughout the project site and during the duration of the project.

Strengthen Dust Control Recordkeeping Requirements (Suggested Measure #21)

Implementation of this measure will include the adoption of regulations that strengthen dust control recordkeeping requirements. Main requirements include:

- Any person who conducts dust-generating operations that do not require a Dust Control Plan shall compile and retain records (including records on any street sweeping, water applications, and maintenance of trackout control devices, gravel

pads, fences, wind barriers, and tarps) that provide evidence of control measure application, by indicating the type of treatment or control measure, extent of coverage, and date applied.

- Upon verbal or written request by the Control Officer, the log or the records and supporting documentation shall be provided as soon as possible but no later than 48 hours, excluding weekends.

Strengthen Dust Control Coordinator Requirements (Suggested Measure #22)

Implementation of this measure will include the adoption of regulations that strengthen dust control coordinator planning requirements. Main planning requirements that a dust control coordinator is responsible for include:

- The owner and/or operator of a dust-generating operation shall submit to the Control Officer a Dust Control Plan with any permit applications that involve dust generating operations with a disturbed surface area that equals or exceeds 0.10 acre (4,356 square feet):
- Contact information for parties responsible for plan submittal.
- A drawing of the entire project, including boundaries, acres to be disturbed, nearest public roads, north arrow, planned exit locations and unpaved parking lot(s).
- Appropriate control measures for each dust-generating operation
- Dust suppressants to be applied, including all product specifications or label instructions for approved use.
- Specific surface treatments to be used for trackout control.

Additional requirements similar to Maricopa County Rule 310, Section 402.3; 402.4; 402.5; and 402.6 also apply.

Strengthen and Expand Dust Control Monitoring and Violation Requirements (Suggested Measure #23)

Implementation of this measure will include the adoption of regulations that strengthen dust control monitoring and violation requirements. Main requirements include:

- If an Owner and/or Operator has three (3) Notices of Violation that have been adjudicated by the Hearing Officer at the same project for which the Dust Control Permit was issued, the Control Officer or his/her representative may suspend or revoke the permit. Upon suspension or revocation of a permit, all activities that are authorized by that permit shall cease.
- If during any 180-day period an Owner and/or Operator has three (3) Notices of Violation that have been adjudicated by the Hearing Officer for the same Construction site, the Control Officer shall require the posting of a surety bond to

ensure implementation of the mitigation measures set forth in the approved Dust Control Permit for the subject site.

- The Control Officer, or his/her designee can be further empowered to enter upon any said land where any loose soil or dust problem exists, and to take such remedial and corrective action as may be deemed appropriate to cope with and relieve, reduce, or remedy the loose soil, dust situation or condition, when the Owner and/or Operator fails to do so – any cost incurred in connection with the remediation shall be reimbursed by the landowner.

Strengthen Project and Trenching Signage Requirements (Suggested Measure #24)

Implementation of this measure will include the adoption of regulations that strengthen signage requirements. Main requirements include:

- For each Dust Control Permit issued where the project site is less than or equal to ten (10) acres, or for Trenching projects between one hundred (100) feet and one (1) mile in length, or for demolition of a structure totaling one thousand (1,000) square feet or more, the permittee shall install a sign on the project site prior to commencing Construction activity that is visible to the public and measures, at minimum, four (4) feet wide by four (4) feet high.
- For each Dust Control Permit issued where the project site is over ten (10) acres, or for Trenching projects aggregating one (1) mile or greater in length, the permittee shall install a sign on the project site prior to commencing Construction Activity and visible to the public and measures, at minimum, eight (8) feet wide by four (4) feet high.

Adopt Dust Control Training Requirements for Project Coordinators and Foreman (Suggested Measure #25)

Implementation of this measure will include the adoption of regulations for the training of dust control coordinators. Main requirements include:

- At least once every three years, the specified persons shall successfully complete a Basic Dust Control Training Class conducted or approved by the Control Officer.
- The following persons present at a site that is subject to a permit issued by the Control Officer requiring control of PM_{10} emissions from dust-generating operations shall complete a Basic Dust Control Training Class: (1) Water truck drivers; (2) Water-pull drivers; (3) The site superintendent or other designated on-site representative of the permit holder, if present at a site that has more than one acre of disturbed surface area.

- A Dust Control Block Permit permittee/holder shall have, at a minimum, one individual trained in accordance with the Basic Dust Control Training Class, if present at a site that has more than one acre of disturbed surface area.
- At least once every three years, the Dust Control Coordinator, shall successfully complete the Comprehensive Dust Control Training Class conducted or approved by the Control Officer.
- The permittee for any site of five acres or more of disturbed surface area subject to a permit issued by the Control Officer requiring control of PM_{10} emissions from dust generating operations shall have on-site at least one Dust Control Coordinator at all times during primary dust generating operations related to the purposes for which the Dust Control permit was obtained.
- At least once every three years, the Dust Control Coordinator shall successfully complete a Comprehensive Dust Control Training Class conducted or approved by the Control Officer.

Pinal County Measure 2 – Open Areas/Vacant Lot Fugitive Dust Sources

As part of their commitments, the Pinal County Air Quality Control District (PCAQCD) grouped Suggested Measures #26, #27, #28, and #30 related to PM-10 emissions from open areas and vacant lots (cleared areas) into Pinal County Measure 2. PCAQCD indicated in their commitments that they will replace existing West Pinal County rules with rule provisions and language that are equal to, or as stringent as, the suggested measures referenced.

PCAQCD has also indicated in their commitments that the Pinal County Board of Supervisors is authorized by A.R.S. § 49-479 to adopt rules for air pollution control and by A.R.S. § 49-480 to establish, administer and enforce a program for air quality permits. The Board adopted rules establishing air quality permit program and pursuant to A.R.S. § 49-473, designated the Air Quality Control District to issue permits and administer and enforce the permit program. By operation of A.R.S. § 49-471, the executive head of the department designated under A.R.S. § 49-473 serves as the Air Pollution Control Officer. The Air Pollution Control Officer is specifically authorized to take the enforcement actions set forth in A.R.S. §§ 49-502, 49-511, 49-512 and 49-513.

In regard to personnel and funding for Pinal County Measure 2, PCAQCD indicated that no change in level of personnel or funding is anticipated for rule development activities. The PCAQCD Compliance Division inspects and determines compliance at fugitive dust sources. Currently the Dust Compliance/Enforcement Division has 1 manager and 2 fugitive dust air quality inspectors. Additionally industrial sources (and their associated open areas, unpaved parking lots, etc.) are covered under the Permitting Division which has 1 dedicated inspector.

PCAQCD will seek approval to hire 1 or more fugitive dust air quality staff to assist with

inspections associated with Pinal County Measures 1-5. PCAQCD will evaluate revenues and expenditures anticipated to meet the committed Measures 1-5 and may propose an increase in fees or additional resources by January 2023/2024, if necessary. PCAQCD's revenue is approximately $1,898,178. Annual costs associated with increased personnel are the following: Additional dust control staff = $150,000.

The implementation schedule provided by PCAQCD in their commitments under Pinal County Measure 2 is as follows:

January, 2022 – March, 2023:	Draft rule revisions proposal and conduct stakeholder workshops
April, 2023:	Oral proceeding on rule revisions proposal
May/June, 2023	Board consideration of rule revisions proposal
June, 2023 – January, 2024	Hire an additional compliance inspector

Regarding enforcement and monitoring programs for Pinal County Measure 2, PCAQCD indicated in their commitments that measure requirements are administered through a visual inspection program. PCAQCD’s enforcement options include notice of opportunity to correct, notice of violation, orders of abatement, civil actions for injunctive relief or civil penalties, and filing a class 1 misdemeanor citation.

PCAQCD tracks the number of vacant lot inspections; the number of enforcement actions; amount of penalties assessed; and compliance with the 24-hour PM-10 standard. The Department will continue to track this information and will perform a rule effectiveness study in 2024 to evaluate compliance with Pinal County Measure 2.

Narrative descriptions of the suggested measures included in Pinal County Measure 2 are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Strengthen Standards for Vacant Lot Size Threshold for Opacity and Stabilization Requirements (Suggested Measure #26)

Implementation of this measure will include the adoption of strengthened regulations specific to open areas and vacant lots as they relate to opacity and stabilization standards. Main requirements include an applicability threshold of 0.1 acres and that the owner/operator of a non-traditional source of fugitive dust that involves vehicle use in open areas and vacant lots shall:

- not cause or allow visible emissions of particulate matter, including fugitive dust, beyond the property line within which the emissions are generated.
- stabilize the open areas and vacant lots on which vehicles are used to meet one of the specified stabilization limitations (e.g., soil crust, threshold friction velocity (TFV) corrected for non-erodible elements of 100 cm/second or higher; vegetative cover, etc.)

Strengthen Existing Vacant Lot Vehicle Use Requirements (Suggested Measure #27)

Implementation of this measure will include the adoption of strengthened regulations specific to vehicle use on open areas and vacant lots. Main vehicle use requirements include:

- Prevent motor vehicle and/or off-road vehicle trespassing, parking, and/or access by installing barriers, curbs, fences, gates, posts, shrubs, trees, or other effective control measures;
- Prevent motor vehicle and/or off-road vehicle trespassing, parking, and/or access by posting ordinances, maps ,etc.
- Uniformly apply and maintain surface gravel or chemical/organic stabilizers to all areas disturbed by motor vehicles and/or off-road vehicles.

Open area requirements include (may have been impacted by vehicle use):

- Establish vegetative ground cover on all disturbed surface areas.
- Apply a dust suppressant to all disturbed surface areas; or
- Uniformly apply and maintain surface gravel; or
- Apply and maintain an alternative control measure approved in writing by the Control Officer and the Administrator.

Additional requirements apply if open areas and vacant lots are 0.10 acre (4,356 square feet) or larger and have a cumulative of 500 square feet or more that are disturbed and if such disturbed area remains unoccupied, unused, vacant, or undeveloped for more than 15 days.

Strengthen Existing Vacant Lot Fugitive Dust Controls (Suggested Measure #28)

Implementation of this measure will include the adoption of strengthened regulations specific to fugitive dust measures for open areas and vacant lots. Main requirements include:

- Establish vegetative ground cover on all disturbed surface areas. Such control measure(s) must be maintained and reapplied, if necessary. Stabilization shall be

achieved, per this control measure, within eight months after the control measure has been implemented; or

- Apply a dust suppressant to all disturbed surface areas; or
- Restore all disturbed surface areas within 60 calendar days following the initial discovery by the Control Officer of the disturbance, such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby undisturbed native conditions. Such control measure(s) must be maintained and reapplied, if necessary. Stabilization shall be achieved, per such control measure, within eight months after such control measure has been implemented; or
- Uniformly apply and maintain surface gravel; or
- Apply and maintain an alternative control measure approved in writing by the Control Officer and the Administrator.

Additional Requirements are specified for 0.10 acre (4,356 square feet) or larger areas that have a cumulative of 500 square feet or more that are disturbed and if such disturbed area remains unoccupied, unused, vacant, or undeveloped for more than 15 days.

Strengthen Weed Abatement Trash Removal requirements for Open Areas/Vacant Lots (Suggested Measure #30)

Implementation of this measure will include the adoption of strengthened regulations specific to weed abatement/trash removal on open areas and vacant lots. When machinery is used to clear weeds or remove trash, the main requirements include:

- Pre-wet surface soils before mechanized weed abatement and/or trash removal occurs; and,
- Maintain dust control measures while mechanized weed abatement and/or trash removal is occurring; and,
- Pave, apply gravel, apply water, or apply a suitable Dust Palliative, in compliance with the stabilization standards set forth in Subsection 90.2.1.2 of this regulation, after mechanized weed abatement and/or trash removal occurs.

The rule also notes that in order to conserve water to the greatest extent practicable, the use of reclaimed water is highly encouraged.

<u>Governor's Agricultural Best Management Practices Committee – Dairy Measures</u>

The Governors' Agricultural Best Management Practices (AgBMP) Committee provided commitments to implement Suggested Measures #31-#37 that apply to dairy operations in the West Pinal County PM-10 nonattainment area. Regulations that implement these commitments have been adopted into the Arizona Administrative Register on November

26, 2021 (see Appendix D, Exhibit 2). As such, these measures are already being implemented locally and are locally enforceable.

As part of their commitments, the AgBMP Committee indicated that the funding source for the AgBMP program (including the committed measures included in this plan) is split between an EPA Performance Partnership Grant and the state's Air Quality Fee Fund. The funds are sufficient to cover the $130,230 personnel costs for two agricultural inspectors and other costs of administering the program by the Arizona Department of Environmental Quality.

Narrative descriptions of Suggested Measures #31-#37, which have been included in the AgBMP commitments, are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Tighten Definition of Dairies Subject to Fugitive Dust Rules (Suggested Measure #31)

Implementation of this measure includes the adoption of regulations lowering the applicability threshold for when dairies are subject to the AgBMP program. The threshold has been lowered to dairies that have 50 or more animals from the prior threshold of 150.

Increase the Number of Dairy Operation Fugitive Dust BMPs (Suggested Measure #32)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for each operational category that generates fugitive dust at dairies. Implementation of this requirement for each operational category is discussed in the following measures.

Increase the Number of Dairy Operation Fugitive Dust BMPs for Arenas, Corrals and Pens (Suggested Measure #33)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from arenas, corrals and pens. The available BMPs include the following:

- Use free stall housing,
- Provide shade in corral,
- Provide cooling in corral,
- Cement cattle walkways to milk barn,
- Groom manure surface,
- Water misting systems,

- Use drag equipment to maintain pens,
- Pile manure between cleanings,
- Feed green chop,
- Keep calves in barns or hutches,
- Do not run cattle,
- Apply a fibrous layer, or
- Wind barrier.

Increase the Number of Dairy Operation Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting (Suggested Measure #34)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from animal waste (and feed) handling and transport. The available BMPs include the following:

- Feed higher moisture feed to dairy cattle,
- Store and maintain feed stock,
- Covers for silage,
- Store silage in bunkers,
- Cover manure hauling trucks, or
- Do not load manure trucks with dry manure when wind exceeds 15 mph.

Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Access Connections (Suggested Measure #35)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from unpaved access connections. The available BMPs include the following:

- Install signage to limit vehicle speed to 15 mph,
- Install speed control devices,
- Restrict access to through traffic,
- Install and maintain a track-out control device,
- Apply and maintain pavement in high traffic areas,
- Apply and maintain aggregate cover,

- Apply and maintain synthetic particulate suppressant, or
- Apply and maintain water as a dust suppressant.

Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Roads or Feed Lanes (Suggested Measure #36)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from unpaved roads or feed lanes. The available BMPs include the following:

- Install engine speed governors on feed truck to 15 mph,
- Install signage to limit vehicle speed to 15 mph,
- Install speed control devices,
- Restrict access to through traffic,
- Apply and maintain pavement in high traffic areas,
- Apply and maintain aggregate cover,
- Apply and maintain synthetic particulate suppressant,
- Apply and maintain water as a dust suppressant,
- Use appropriate vehicles such as electric carts or small utility vehicles instead of trucks, or
- Apply and maintain pavement or cement feed lanes.

Increase the Number of Dairy Operation Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas (Suggested Measure #37)

Implementation of this measure includes the adoption of regulations requiring the implementation of one BMPs for reducing fugitive dust from unpaved vehicle/equipment traffic areas. This operational category is a new category that had not been specifically identified in prior versions of the AgBMP rules. The available BMPs include:

- Apply and maintain aggregate cover,
- Apply and maintain synthetic particulate suppressant,
- Apply and maintain water as a dust suppressant, or
- Use appropriate vehicles such as electric carts or small utility vehicles instead of trucks.

Governor's Agricultural Best Management Practices Committee – Cattle Confined Animal Feeding Operations (CAFO) Measures

The Governors' Agricultural Best Management Practices (AgBMP) Committee provided commitments to implement Suggested Measures #38-#44 that apply to cattle CAFO operations in the West Pinal County PM-10 nonattainment area. Regulations that implement these commitments have been adopted into the Arizona Administrative Register on November 26, 2021 (see Appendix D, Exhibit 2). As such, these measures are already being implemented locally and are locally enforceable.

As part of their commitments, the AgBMP Committee indicated that the funding source for the AgBMP program (including the committed measures included in this plan) is split between an EPA Performance Partnership Grant and the state's Air Quality Fee Fund. The funds are sufficient to cover the $130,230 personnel costs for two agricultural inspectors and other costs of administering the program.

Narrative descriptions of Suggested Measures #38-#44, which have been included in the AgBMP commitments, are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Tighten Definition of Cattle Confined Animal Feeding Operations (CAFO) Subject to Fugitive Dust Rules (Suggested Measure #38)

Implementation of this measure includes the adoption of regulations lowering the applicability threshold for when cattle CAFOs are subject to the AgBMP program. The threshold has been lowered to cattle CAFOs that have 50 or more animals from the prior threshold of 500.

Increase the Number of Cattle CAFO Fugitive Dust BMPs (Suggested Measure #39)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for each operational category that generates fugitive dust at cattle CAFOs. Implementation of this requirement for each operational category is discussed in the following measures.

Increase the Number of Cattle CAFO Fugitive Dust BMPs for Arenas, Corrals and Pens (Suggested Measure #40)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from arenas, corrals and pens. The available BMPs include the following:

- Concrete aprons,

- Provide shade in corral,
- Add water to pen surface,
- Manure removal,
- Pile manure between cleanings,
- Feed higher moisture feed to beef cattle,
- Control cattle during movements,
- Use drag equipment to maintain pens,
- Apply a fibrous layer, or
- Wind barrier.

Increase the Number of Cattle CAFO Fugitive Dust BMPs for Animal Waste (and Feed) Handling and Transporting (Suggested Measure #41)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from animal waste (and feed) handling and transport. The available BMPs include the following:

- Feed higher moisture feed to dairy cattle,
- Add molasses or tallow to feed,
- Store and maintain feed stock,
- Bulk materials,
- Use drag equipment to maintain pens,
- Cover manure hauling trucks, or
- Do not load manure trucks with dry manure when wind exceeds 15 mph.

Increase the Number of Cattle CAFO Fugitive Dust BMPs for Unpaved Access Connections (Suggested Measure #42)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from unpaved access connections. The available BMPs include the following:

- Install and maintain a track-out control device,
- Apply and maintain pavement in high traffic areas,
- Apply and maintain aggregate cover,

- Apply and maintain synthetic particulate suppressant, or
- Apply and maintain water as a dust suppressant.

Increase the Number of Cattle CAFO Fugitive Dust BMPs for Unpaved Roads or Feed Lanes (Suggested Measure #43)

Implementation of this measure includes the adoption of regulations requiring the implementation of two (up from the current one) best management practices for reducing fugitive dust from unpaved roads or feed lanes. The available BMPs include the following:

- Install engine speed governors on feed truck to 15 mph,
- Install signage to limit vehicle speed to 15 mph,
- Install speed control devices,
- Restrict access to through traffic,
- Apply and maintain pavement in high traffic areas,
- Apply and maintain aggregate cover,
- Apply and maintain synthetic particulate suppressant,
- Apply and maintain water as a dust suppressant, or
- Apply and maintain oil on roads or feed lanes.

Increase the Number of Cattle CAFO Fugitive Dust BMPs for Unpaved Vehicle/Equipment Traffic Areas (Suggested Measure #44)

Implementation of this measure includes the adoption of regulations requiring the implementation of one BMPs for reducing fugitive dust from unpaved vehicle/equipment traffic areas. This operational category is a new category that had not been specifically identified in prior versions of the AgBMP rules. The available BMPs include:

- Apply and maintain aggregate cover,
- Apply and maintain synthetic particulate suppressant,
- Apply and maintain water as a dust suppressant, or
- Use appropriate vehicles such as electric carts or small utility vehicles instead of trucks.

<u>Governor's Agricultural Best Management Practices Committee – Agricultural Cropland Measures</u>

The Governors' Agricultural Best Management Practices (AgBMP) Committee provided

commitments to implement Suggested Measures #45, #46, #47, #50, and #51 that apply to agricultural cropland operations in the West Pinal County PM-10 nonattainment area. Regulations that implement these commitments have been adopted into the Arizona Administrative Register on November 26, 2021 (see Appendix D, Exhibit 2). As such, these measures are already being implemented locally and are locally enforceable.

As part of their commitments, the AgBMP Committee indicated that the funding source for the AgBMP program (including the committed measures included in this plan) is split between an EPA Performance Partnership Grant and the state's Air Quality Fee Fund. The funds are sufficient to cover the $130,230 personnel costs for two agricultural inspectors and other costs of administering the program.

Narrative descriptions of Suggested Measures #45, #46, #47, #50, and #51, which have been included in the AgBMP commitments, are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Increase the Number of BMPs to Control Fugitive Dust from Cropland Areas (Suggested Measure #45)

Implementation of this measure includes the adoption of regulations that will be equivalent to the use of 3 conservation management practices (similar, but less extensive as compared to existing BMPs) to be in use for the control of fugitive dust from cropland areas. The BMP requirements for cropland that are in place and included in regulations provided for adoption by EPA (Appendix D, Exhibit 2) are equivalent to the use of 3 conservation management practices.

BMPs to Control Fugitive Dust on Noncropland Areas that are not Tied to High Risk Days (Suggested Measure #46)

Implementation of this measure includes the adoption of regulations that establish a BMP to control fugitive dust specific to vehicle use on noncropland areas (e.g., equipment storage yards), at all times. The particular BMP adopted states that "On each day that traffic accounts for 50 or more vehicle daily trips, or 20 or more vehicle daily trips with 3 or more axles, within an unpaved vehicle or equipment traffic area, the opacity of emissions shall be limited to no more than 20% measured according to 40 CFR 60, Appendix A, Reference Method 9."

Increase the Number of BMPs for the Control of Fugitive Dust from Commercial Farm Roads (Suggested Measure #47)

Implementation of this measure includes the adoption of regulations that increase the number of fugitive dust BMPs required for commercial farm roads from one to two. The

available BMPs include:

- Access restriction,
- Reduce vehicle speed,
- Track-out control system,
- Aggregate cover,
- Synthetic particulate suppressant,
- Watering, or
- Organic material cover,

Increase the Minimum Number of Agricultural Earth Moving BMPs (Suggested Measure #50)

Implementation of this measure includes the adoption of regulations that increase the number of fugitive dust BMPs required for agricultural earth moving from one to two. The available BMPs include:

- Apply water prior to conducting Significant Agricultural Earth Moving Activities and/or time Significant Agricultural Earth Moving Activities to coincide with precipitation. Soil must have a minimum soil moisture content of 50% of field capacity. Compliance shall be determined by National Resources Conservation Service (NRCS) Estimating Soil Moisture by Feel and Appearance Method, amended through April 1998 (and no future editions);
- Apply water during Significant Agricultural Earth Moving Activities. Soil must have a minimum soil moisture content of 30% of field capacity. Compliance shall be determined by NRCS Estimating Soil Moisture by Feel and Appearance Method, amended through April 1998 (and no future editions);
- Limit activities on a day identified by the Maricopa or Pinal County Dust Control Forecast to be high risk for dust generation; or
- Conduct Significant Agricultural Earth Moving Activities in a manner to reduce a minimum of one ground operation across a commercial farm by using equipment that is the most efficient means of moving the soil.

Require Implementation of BMPs to Control Windblown Dust from Crop Operations on All Days (Suggested Measure #51)

Implementation of this measure includes the adoption of regulations that require the use of BMPs that reduce windblown fugitive dust from crop operations. Analysis of this measure found that the daily implementation of the BMPs required for crop operations (e.g., tilling, and ground operations and harvesting) satisfy the implementation

requirements of this measure. Regulations have been adopted requiring the use of two BMPs for crop operations at all times (Appendix D, Exhibit 2) which ensure that windblown dust from crop operations are controlled on all days.

Pinal County Measure 3 – Unpaved Roads

As part of their commitments, the Pinal County Air Quality Control District (PCAQCD) grouped Suggested Measures #52-#56 related to PM-10 emissions from public unpaved roads into Pinal County Measure 3. PCAQCD indicated in their commitments that they will replace existing West Pinal County rules with rule provisions and language that are equal to, or as stringent as, the suggested measures referenced.

PCAQCD has also indicated in their commitments that the Pinal County Board of Supervisors is authorized by A.R.S. § 49-479 to adopt rules for air pollution control and by A.R.S. § 49-480 to establish, administer and enforce a program for air quality permits. The Board adopted rules establishing air quality permit program and pursuant to A.R.S. § 49-473, designated the Air Quality Control District to issue permits and administer and enforce the permit program. By operation of A.R.S. § 49-471, the executive head of the department designated under A.R.S. § 49-473 serves as the Air Pollution Control Officer. The Air Pollution Control Officer is specifically authorized to take the enforcement actions set forth in A.R.S. §§ 49-502, 49-511, 49-512 and 49-513.

In regard to personnel and funding for Pinal County Measure 3, PCAQCD indicated that no change in level of personnel or funding is anticipated for rule development activities. The PCAQCD Compliance Division inspects and determines compliance at fugitive dust sources. Currently the Dust Compliance/Enforcement Division has 1 manager and 2 fugitive dust air quality inspectors. Additionally industrial sources (and their associated open areas, unpaved parking lots, etc.) are covered under the Permitting Division which has 1 dedicated inspector.

PCAQCD will seek approval to hire 1 or more fugitive dust air quality staff to assist with inspections associated with Pinal County Measures 1-5. PCAQCD will evaluate revenues and expenditures anticipated to meet the committed Measures 1-5 and may propose an increase in fees or additional resources by January 2023/2024, if necessary. PCAQCD's revenue is approximately $1,898,178. Annual costs associated with increased personnel are the following: Additional dust control staff = $150,000.

The implementation schedule provided by PCAQCD in their commitments under Pinal County Measure 3 is as follows:

January, 2022 – March, 2023:	Draft rule revisions proposal and conduct stakeholder workshops
April, 2023:	Oral proceeding on rule revisions proposal

May/June, 2023	Board consideration of rule revisions proposal
June, 2023 – January, 2024	Hire an additional compliance inspector

Regarding enforcement and monitoring programs for Pinal County Measure 3, PCAQCD indicated in their commitments that measure requirements are administered through a visual inspection program. PCAQCD's enforcement options include notice of opportunity to correct, notice of violation, orders of abatement, civil actions for injunctive relief or civil penalties, and filing a class 1 misdemeanor citation.

PCAQCD tracks the miles of public unpaved roads; the number of enforcement actions; amount of penalties assessed; and compliance with the 24-hour PM-10 standard. The Department will continue to track this information and will perform a rule effectiveness study in 2024 to evaluate compliance with Pinal County Measure 3.

Narrative descriptions of the suggested measures included in Pinal County Measure 3 are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Expand Unpaved Road Definitions to Include Alleys (Suggested Measure #52)

Implementation of this measure would include the adoption of regulations to incorporate alleys into the definition of an unpaved road.

Increase Average Daily Traffic (ADT) Thresholds for Unpaved Road Controls (Suggested Measure #53)

Implementation of this measure would include the adoption of regulations that would set the threshold for when a public unpaved road should be stabilized to 26 ADT. A threshold of 26 ADT is lower than the current threshold of 150 ADT.

Visible Emissions and Stabilization Requirements for Unpaved Roads (Suggested Measure #54)

Implementation of this measure would include the adoption of regulations that provide explicit control requirements to ensure that, in conjunction with Suggested Measure #54, visible emissions, opacity and stabilization requirements are met. Explicit control requirements include:

- Fugitive Dust PM-10 Management Plan for unpaved road operators/owners
- Watering;
- Uniform layer of washed gravel;

- Chemical/organic dust stabilizers/suppressants in accordance with the manufacturer's specifications;
- Roadmix;
- Paving;
- Any other method that can be demonstrated to the satisfaction of the APCO that effectively limits VDE to 20% opacity and meets the conditions of a stabilized unpaved road.

Increase Stringency of Unpaved Road Paving and Dust Stabilization Controls (Suggested Measure #55)

Implementation of this measure would include the adoption of regulations that increase the stringency of existing unpaved road paving and stabilization controls. More stringent requirements include prohibitions on the construction of new unpaved roads, specific paving percentage goals, and a maximum speed limit of 25 mph on unpaved roads.

Expand Existing Reporting/Recordkeeping Requirements for Unpaved Roads (Suggested Measure #56)

Implementation of this measure includes the adoption of regulations that expand reporting and recordkeeping requirements for unpaved roads. Key recordkeeping and reporting requirements include:

- The total miles of paved and unpaved roads under the jurisdiction of the owner or agency and the miles of roads constructed or modified during the reporting period subject to the requirements of this regulation.
- For newly constructed or modified roads, a summary of actions taken during the reporting period to prevent or mitigate PM-10 emissions, with miles specified for each type of control measure used to reduce PM-10 emissions.
- For all roads under the agency's jurisdiction, a summary of actions taken to reduce PM_{10} emissions from roads during the reporting period. The total miles of roads for which these procedures were enforced and the estimated traffic volume on the affected roads shall be provided.

<u>Pinal County Measure 4 – Unpaved Lots</u>

As part of their commitments, the Pinal County Air Quality Control District (PCAQCD) grouped Suggested Measures #58 and #59 related to PM-10 emissions from unpaved lots into Pinal County Measure 4. PCAQCD indicated in their commitments that they will replace existing West Pinal County rules with rule provisions and language that are equal to, or as stringent as, the suggested measures referenced.

PCAQCD has also indicated in their commitments that the Pinal County Board of Supervisors is authorized by A.R.S. § 49-479 to adopt rules for air pollution control and by A.R.S. § 49-480 to establish, administer and enforce a program for air quality permits. The Board adopted rules establishing air quality permit program and pursuant to A.R.S. § 49-473, designated the Air Quality Control District to issue permits and administer and enforce the permit program. By operation of A.R.S. § 49-471, the executive head of the department designated under A.R.S. § 49-473 serves as the Air Pollution Control Officer. The Air Pollution Control Officer is specifically authorized to take the enforcement actions set forth in A.R.S. §§ 49-502, 49-511, 49-512 and 49-513.

In regard to personnel and funding for Pinal County Measure 4, PCAQCD indicated that no change in level of personnel or funding is anticipated for rule development activities. The PCAQCD Compliance Division inspects and determines compliance at fugitive dust sources. Currently the Dust Compliance/Enforcement Division has 1 manager and 2 fugitive dust air quality inspectors. Additionally industrial sources (and their associated open areas, unpaved parking lots, etc.) are covered under the Permitting Division which has 1 dedicated inspector.

PCAQCD will seek approval to hire 1 or more fugitive dust air quality staff to assist with inspections associated with Pinal County Measures 1-5. PCAQCD will evaluate revenues and expenditures anticipated to meet the committed Measures 1-5 and may propose an increase in fees or additional resources by January 2023/2024, if necessary. PCAQCD's revenue is approximately $1,898,178. Annual costs associated with increased personnel are the following: Additional dust control staff = $150,000.

The implementation schedule provided by PCAQCD in their commitments under Pinal County Measure 4 is as follows:

January, 2022 – March, 2023:	Draft rule revisions proposal and conduct stakeholder workshops
April, 2023:	Oral proceeding on rule revisions proposal
May/June, 2023	Board consideration of rule revisions proposal
June, 2023 – January, 2024	Hire an additional compliance inspector

Regarding enforcement and monitoring programs for Pinal County Measure 4, PCAQCD indicated in their commitments that measure requirements are administered through a visual inspection program. PCAQCD’s enforcement options include notice of opportunity to correct, notice of violation, orders of abatement, civil actions for injunctive relief or civil penalties, and filing a class 1 misdemeanor citation.

PCAQCD tracks the number of vacant lot inspections; the number of enforcement actions; amount of penalties assessed; and compliance with the 24-hour PM-10 standard. The

Department will continue to track this information and will perform a rule effectiveness study in 2024 to evaluate compliance with Pinal County Measure 4.

Narrative descriptions of the suggested measures included in Pinal County Measure 4 are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Add 0% Opacity at Property Line Provision to Unpaved Lot Requirements (Suggested Measure #58)

Implementation of this measure will include the adoption of regulations to ensure that visible emissions (dust plume) do not cross the property line of an unpaved parking lot or vacant lot.

More Stringent Unpaved Lot Fugitive Dust Control Measures (Suggested Measure #59)

Implementation of this measure will include the adoption of regulations that provide more stringent and specific fugitive dust control measures for unpaved parking lots. More stringent controls include the use of trackout control devices where applicable and the specification of dust suppressants other than water.

Pinal County Measure 5 – Paved Roads

As part of their commitments, the Pinal County Air Quality Control District (PCAQCD) grouped Suggested Measures #61-#64, #66, #67, #69, and #70 related to PM-10 emissions from paved roads into Pinal County Measure 5. PCAQCD indicated in their commitments that they will replace existing West Pinal County rules with rule provisions and language that are equal to, or as stringent as, the suggested measures referenced.

PCAQCD has also indicated in their commitments that the Pinal County Board of Supervisors is authorized by A.R.S. § 49-479 to adopt rules for air pollution control and by A.R.S. § 49-480 to establish, administer and enforce a program for air quality permits. The Board adopted rules establishing air quality permit program and pursuant to A.R.S. § 49-473, designated the Air Quality Control District to issue permits and administer and enforce the permit program. By operation of A.R.S. § 49-471, the executive head of the department designated under A.R.S. § 49-473 serves as the Air Pollution Control Officer. The Air Pollution Control Officer is specifically authorized to take the enforcement actions set forth in A.R.S. §§ 49-502, 49-511, 49-512 and 49-513.

In regard to personnel and funding for Pinal County Measure 5, PCAQCD indicated that no change in level of personnel or funding is anticipated for rule development activities. The PCAQCD Compliance Division inspects and determines compliance at fugitive dust sources. Currently the Dust Compliance/Enforcement Division has 1 manager and 2

fugitive dust air quality inspectors. Additionally industrial sources (and their associated open areas, unpaved parking lots, etc.) are covered under the Permitting Division which has 1 dedicated inspector.

PCAQCD will seek approval to hire 1 or more fugitive dust air quality staff to assist with inspections associated with Pinal County Measures 1-5. PCAQCD will evaluate revenues and expenditures anticipated to meet the committed Measures 1-5 and may propose an increase in fees or additional resources by January 2023/2024, if necessary. PCAQCD's revenue is approximately $1,898,178. Annual costs associated with increased personnel are the following: Additional dust control staff = $150,000.

The implementation schedule provided by PCAQCD in their commitments under Pinal County Measure 5 is as follows:

January, 2022 – March, 2023:	Draft rule revisions proposal and conduct stakeholder workshops
April, 2023:	Oral proceeding on rule revisions proposal
May/June, 2023	Board consideration of rule revisions proposal
June, 2023 – January, 2024	Hire an additional compliance inspector

Regarding enforcement and monitoring programs for Pinal County Measure 5, PCAQCD indicated in their commitments that measure requirements are administered through a visual inspection program. PCAQCD’s enforcement options include notice of opportunity to correct, notice of violation, orders of abatement, civil actions for injunctive relief or civil penalties, and filing a class 1 misdemeanor citation.

PCAQCD tracks the number of enforcement actions; amount of penalties assessed; and compliance with the 24-hour PM-10 standard. The Department will continue to track this information and will perform a rule effectiveness study in 2024 to evaluate compliance with Pinal County Measure 5.

Narrative descriptions of the suggested measures included in Pinal County Measure 5 are included below. The descriptions are summarized (and updated where necessary) from the information included in the Trinity Consultants Final Report, Analyses of Best Available Control Measures and Most Stringent Measures for the West Pinal County Serious PM-10 Nonattainment Area (Appendix C, Exhibit 3).

Strengthen Stabilization Requirements for Unpaved Shoulders (Suggested Measure #61)

Implementation of this measure includes the adoption of regulations that will require specific stabilization requirements for unpaved shoulders and medians next to paved roads. Specific requirements include limits on visible emissions and silt loading, and the

specification of use of stabilizing agents like gravel or pavement.

Paving and/or Stabilization of Shoulder and Medians on New and Modified Paved Roads (Suggested Measure #62)

Implementation of this measure will include the adoption of regulations that require specific stabilization requirements and standards for shoulders and medians associated with new and modified paved roads. Regulations include standards such as:

- New construction, modification, or approvals of paved roads shall be constructed with a paved travel section, and four (4) feet of paved or stabilized shoulder on each side of the paved travel section and must be paved or stabilized with a dust palliative or gravel to prevent trackout.
- New construction, modification, or approvals of paved roads on which vehicular traffic is greater than or equal to 3,000 vehicles per day shall be constructed with a paved travel section, and eight (8) feet of stabilized shoulder adjacent to the paved travel section where right-of-way is available for the stabilized shoulder.
- Where paved roads are constructed, or modified with shoulders and/or medians, the shoulders and/or medians shall be constructed with curbing, or paving or dust palliatives, gravel or rock to prevent trackout.

Immediate Cleanup of Trackout, Carryout, and Spillage from Areas Accessible to the Public (Suggested Measure #63)

Implementation of this measure will include the adoption of regulations that will require immediate cleanup of trackout, carryout and spillage of dirt and debris onto public paved road and surfaces. The criterion for immediate cleanup of trackout, carry-out, spillage, and/or erosion from areas accessible to the public including curbs, gutters, and sidewalks, on the following time-schedule:

- Immediately, when trackout, carry-out, or spillage extends a cumulative distance of 25 linear feet or more; and
- At the end of the workday, for all other trackout, carry-out, spillage, and/or erosion.

Use of Only PM-10 Certified Street Sweepers to Cleanup Trackout Deposits on Paved Roads from any Source (Suggested Measure #64)

Implementation of this measure will include adoption of regulations that will require the use of PM-10 certified street sweepers to cleanup trackout deposits on paved roadways. Key requirements include:

- Any government or government agency which contracts to acquire street sweeping equipment or street sweeping services for routine street sweeping on public roads that it owns and/or maintains, shall acquire or use only certified street sweeping equipment.
- Any government or government agency and/or its contractors shall operate and maintain the certified street sweeping equipment in accordance with the manufacturer's specifications.

Use of PM-10 Certified Street Sweepers on Freeways and Arterials (Suggested Measures #66 and #67)

Implementation of this measure will include the adoption of regulations that will require the use of PM-10 certified street sweepers on paved freeways and arterials for removal of visible roadway material within 72 hours of notification, and for routine, scheduled sweeping operations on freeways and arterials. Similar to measure #64, requirements include:

- Any owner or operator of a paved public road on which there is visible roadway accumulations shall begin removal of such material through street cleaning within 72 hours of any notification of the accumulation and shall completely remove such material as soon as feasible.
- Any government or government agency which contracts to acquire street sweeping equipment or street sweeping services for routine street sweeping on public roads that it owns and/or maintains, shall acquire or use only certified street sweeping equipment.
- Any government or government agency and/or its contractors shall operate and maintain the certified street sweeping equipment in accordance with the manufacturer's specifications.

Strengthen Existing Paved Road and Shoulder Standards through Inclusion of Provisions Addressing Non-conforming Roads and Shoulder Requirements (Suggested Measure #69)

Implementation of this measure will include the adoption of standards for construction of paved roads, and reconstruction of existing roads, to minimize fugitive dust emissions from those roads. Key requirements include:

- New construction, modification, or approvals of paved roads shall be constructed with a paved travel section, and four (4) feet of paved or stabilized shoulder on each side of the paved travel section. The four (4) feet of shoulder shall be paved or stabilized with a dust palliative or gravel to prevent the trackout of mud and dirt to the paved section.

- New construction, modification, or approvals of paved roads on which vehicular traffic is greater than or equal to 3,000 vehicles per day shall be constructed with a paved travel section, and eight (8) feet of stabilized shoulder adjacent to the paved travel section where right-of-way is available for the stabilized shoulder.
- Where curbing is constructed adjacent to and contiguous with the travel lane or paved shoulder of a road, the shoulder width design standards shall not be applicable.
- Where paved roads are constructed, or modified with shoulders and/or medians, the shoulders and/or medians shall be constructed as set forth in applicable stabilization standards.

Strengthen Reporting and Recordkeeping Requirements to Include Street Sweeping Extent and Frequency as Well as Dust Control Plans that Affect Trackout Compliance (Suggested Measure #70)

Implementation of this measure will include the adoption of regulations that will strengthen the recordkeeping and reporting requirements associated with street sweeping operations and compliance with limiting trackout onto paved roads. Key recordkeeping requirements include:

- Dust Control Plan self-inspection records shall include daily inspections for crusted or damp soil, trackout conditions and clean-up measures, daily water usage for dust control measures, and dust suppressant application.
- Any person who conducts dust-generating operations that do not require a Dust Control Plan shall compile and retain records (including records on any street sweeping, water applications, and maintenance of trackout control devices, gravel pads, fences, wind barriers, and tarps) that provide evidence of control measure application, by indicating the type of treatment or control measure, extent of coverage, and date applied.
- Any person who conducts dust-generating operations that require a Dust Control Plan shall retain copies of approved Dust Control Plans, control measures implementation records, and all supporting documentation for at least six months following the termination of the dust-generating operation and for at least two years from the date such records were initiated. If a person has obtained a Title V Permit and is subject to the requirements of this rule, then such person shall retain records required by this rule for at least five years from the date records are established.

REASONED JUSTIFICATION FOR NOT IMPLEMENTING MEASURES

Of the 70 suggested measures, nine measure were determined to be infeasible for implementation. The information below was provided in commitments received from the PCAQCD and the AgBMP Committe and summarizes the reasoned justification for not

implementing the nine measures.

Pinal County Air Quality Control District (PCAQCD)

Suggested Measure 11 (Construction Sites, Adopt Sand Blasting & Abrasive Blasting Dust BMPs)

PCAQCD has not observed large scale sand blasting or abrasive blasting at construction sites. Rather, it has been observed that those activities are more prevalent at facilities such as auto body shops and fabrication shops which are permitted by PCAQCD's minor source permitting program if their PTE exceeds 1 ton per year of PM-10 emissions. Residential and commercial construction in the West Pinal PM-10 Nonattainment Area are predominantly new construction, therefore, construction related sand blasting and abrasive blasting in the West Pinal PM-10 NAA was determined to be De Minimis. Additionally, PCAQCD determined the measure is not economically feasible considering the cost per ton of PM I 0 reduction is $17,713,432 and would result in 0.00011 tons of PM-10 emission reduction across the nonattainment area.

Suggested Measure 15 (Construction Sites, Adopt Crushing Operation Dust Control BMP)

The majority of residential construction that takes place in the West Pinal PM to NAA is new construction and is located primarily on former farmlands or vacant lands. These areas do not include existing foundations to be removed. Required base materials are imported from other locations. Large scale construction projects such as commercial and highway construction may utilize onsite processing of base materials and concrete. In those situations, the crushing and screening equipment would be required to obtain an operating permit from the Arizona Department of Environmental Quality for portable sources or PCAQCD for stationary sources. In both cases the equipment would be subject to applicable stack and drop point emission controls and surface stabilization of work areas would be subject to PCAQCD fugitive dust controls identified in the fugitive dust construction rules, specifically measures committed to in Pinal County Measure 1. PCAQCD has determined that this measure is duplicative, unnecessary, and economically infeasible.

Measure 17 (Construction Sites, Adopt Screening Operation Dust Control BMP)

Same justification as for Measure 15.

Suggested Measure 29 (Cleared Areas, Require Mitigation Plans for Open Areas/Vacant Lots Over 10,000 Acres in Size)

There are currently no open areas/vacant lots (i.e., cleared areas) within the West Pinal Serious PM-10 nonattainment area that exceed the 10,000-acre applicability threshold. This is supported by the Trinity analysis. Therefore, it is economically and technically

infeasible to commit to a mitigation plan requirement for something which doesn't apply to the West Pinal nonattainment area.

Suggested Measure 57 (Unpaved Roads, Explicit Dust Mitigation Controls for Off-Road Event Competitions on Unpaved Roads)

Measure 57 (Imperial County Rules 800.F.5) applies to established recreational off road use areas on public lands and imposes a dust control plan and related control measures. Imperial's rule appears to address a peculiar local condition. There are no off-road recreational use areas currently identified on public lands in the West Pinal Serious PM-10 nonattainment area. Therefore, PCAQCD has concluded that implementing this measure would not provide quantifiable emission reductions in the area and is unnecessary for compliance.

Suggested Measure 60 (Unpaved Lots, Prohibit Unpaved Lot/Storage Areas on Hydrographic Lands)

PCAQCD has committed to Measures 58 and 59 which implement control requirements for vacant lots. Based upon this information PCAQCD concluded that the measure is duplicative, unnecessary, and as such economically infeasible.

Suggested Measure 68 (Paved Roads, Require Use of Wetted Brushes and Blowers on Sweepers Used on Both Paved Roads and Parking Lots and Only Vacuum-Type Cleaning Equipment in Pavement Crack Sealing Applications)

The Trinity BACM/MSM analysis referenced the " ... existing fugitive dust opacity limits in West Pinal were determined to pre-empt the equipment requirements of this measure; therefore, it has no benefit." Based upon this information PCAQCD concluded that the measure is duplicative, unnecessary, and as such economically infeasible.

<u>Agricultural Best Management Practices Committee</u>

Measure 48 (Agriculture, Stabilization Requirements for Off-Field Bulk Material Storage)

This measure reflecting controls for bulk materials has not been adopted by the AgBMP Committee for implementation, because crop producers in Pinal County do not haul, transport, or store bulk materials. They only haul or store course fibrous products such as cotton seed, lint, hay fiber, large feed fiber chopped from plant materials, or grain products. This measure would therefore not contribute to expeditious attainment of the PM10 NAAQS and under EPA guidance need not be implemented in the West Pinal Serious PM10 Nonattainment Area.

Suggested Measure 49 (Agriculture, Fugitive Dust Controls for Off-Field Bulk Material Handling and Transport)

Same justification as for Measure 48.

TRACKING PLAN IMPLEMENTATION

The Pinal County Air Quality Control District (PCAQCD) and the Arizona Department of Environmental Quality (ADEQ) will develop PM-10 emission inventories to determine reasonable further progress. PCAQCD and ADEQ will also review the implementation status of the various measures contained in the 2022 Serious Area Particulate Plan for PM-10. The Pinal County Air Quality Control District will also continue to have the responsibility for conducting ambient air quality monitoring.

Supplemental to these tracking efforts, the Maricopa Association of Governments (MAG) publishes regional traffic flow maps and calculates regional vehicle miles of travel from these flow maps. MAG also conducts vehicle occupancy studies and performs special traffic volume and speed studies, as needed. MAG may also assist in the development and modeling of PM-10 emissions for various sources as requested.

In addition, the MAG Air Quality Technical Advisory Committee will review information pertaining to the implementation of measures. The committee will also review the air quality monitoring data to assist in tracking air quality improvement over time.

ASSURANCES THAT THE STATE HAS THE AUTHORITY TO IMPLEMENT THE MEASURES IN THE PLAN

In order to comply with Section 110(a)(2)(E) of the Clean Air Act, a State law was passed in 1992 which provides an approach for assurances that State and local committed measures will be adequately implemented (A.R.S. Section 49-406 I. and J.). If any person (includes State, County, local governments and other entities) fails to implement a committed measure, the County would file an action in Superior Court to have the Court order that the measure be implemented. Likewise, the Director of the Arizona Department of Environmental Quality will backstop the County if it fails to implement a committed measure or if the County fails to backstop the local governments and regional agencies.

Regarding committed measures, A.R.S. Section 49-406 G. (passed by the Legislature in 1992) requires that each agency which commits to implement any control measure contained in the State Implementation Plan must describe the commitment in a resolution. The resolution must be adopted by the appropriate governing body of the agency. State law also requires the entity to specify the following information in the resolutions: (1) its authority for implementing the limitation or measure as provided in statute, ordinance, or rule; (2) a program for the enforcement of the limitation or measure; and (3) the level of personnel and funding allocated to the implementation of the measure.

As noted in the MAG regional air quality plans, the action taken by the MAG Regional Council to approve the Suggested List of Measures and Adopted Plan Measures does not commit each jurisdiction to implement those measures. As indicated in the resolutions

and commitments, each jurisdiction determines which measures are reasonably available for implementation by that jurisdiction.

8. ATTAINMENT DEMONSTRATION

Chapter 8 discusses the key elements of the PM-10 modeling process, including an extension of the attainment date, an evaluation of committed control measures, the air quality modeling analysis methods utilized, the modeled attainment demonstration and weight of evidence factors evaluated to support the attainment demonstration. In addition, this chapter also addresses motor vehicle emissions budgets/transportation conformity, contingency measures, reasonable further progress, and milestones.

ATTAINMENT DATE EXTENSION REQUEST

The PM-10 National Ambient Air Quality Standards (NAAQS) attainment date for the West Pinal County Serious PM-10 nonattainment area is December 31, 2022. As shown in Chapter 3 and 9, attainment of the PM-10 NAAQS in the West Pinal County nonattainment area by December 31, 2022 is impracticable. In order to demonstrate attainment of the PM-10 standard in the West Pinal County nonattainment area, an extension of the attainment date will be required.

Clean Air Act Section 188(e) allows the attainment date for a Serious PM-10 nonattainment area to be extended for up to five years. Extensions can be granted by the EPA Administrator upon application by any state provided that several requirements are satisfied. Chapter 9 includes the discussions and data analyses that compromise a formal request for an extension of the attainment date until December 31, 2026. As shown in the attainment modeling sections below, December 31, 2026 is the most expeditious attainment date possible.

EVALUATION OF COMMITTED CONTROL MEASURES

As described in Chapter 7, commitments were made to implement 61 of the 70 suggested Best Available Control Measures and Most Stringent Measures. In order to demonstrate attainment of the PM-10 standard, the PM-10 emission reduction benefits of the committed control measures were quantified. Some of the committed control measures were not readily quantifiable. However, the implementation of these measures will reinforce the impact of the committed control measures for which benefits have been quantified and provide additional assurance that attainment of the PM-10 standard will be achieved.

In this section, a summary of the PM-10 emission reduction benefits of committed control measures is provided. Detailed descriptions of the calculation of individual control measures is included in the Technical Support Document (Appendix B, Exhibit 1). Out of the 61 committed measures, 48 measures were able to provide quantifiable emission reductions.

The committed control measure benefits presented in this section reflect annual and average-day emission reductions for the entire West Pinal County nonattainment area to

support the Reasonable Further Progress demonstration and to demonstrate reductions in PM-10 emissions throughout the nonattainment area. Controlled emission inventories and emission reductions were also developed for specific design days as modeling domains as described in later sections of this chapter. As attainment has been demonstrated for December 31, 2026, the controlled emissions inventories in this section represent annual 2026 emissions.

Based on the quantitative analyses of committed measures performed in the Technical Support Document, Table 8-1 includes a summary of the 2026 controlled annual and average-day PM-10 emissions within the nonattainment area. Figures 8-1 and 8-2 respectively include pie charts of 2026 controlled annual and average day PM-10 emissions.

Table 8-1
2026 Controlled Annual and Daily Average PM-10 Emissions
in the West Pinal County Nonattainment Area

Source Category	Annual PM-10 Emissions (tons/year)	Daily PM-10 Emissions (lbs/year)
Point Sources		
Permitted Sources	464	2,542
Nonpoint Sources		
Harvesting and Tilling	1,463	18,110
Concentrated Animal Feeding Operations (CAFOs)	945	5,179
Dairies	171	935
Construction	1,092	8,273
Commercial Cooking	135	741
Fuel Combustion	101	946
Miscellaneous Non-Industrial Processes	16	89
Open Burning	43	357
Unpaved Parking	167	915
Windblown Dust	3,340	18,302
Nonroad Mobile Sources		
Nonroad Mobile Sources	78	464
Onroad Mobile Sources		
Onroad Mobile Sources (exhaust, brake/tire wear)	134	727
Paved Road Dust	1,015	5,560
Unpaved Road Dust - Agricultural Roads	6,279	34,408
Unpaved Road Dust - Private Roads	11,983	65,661
Unpaved Road Dust - Public Roads	5,668	31,055
Unpaved Road Dust - Trails	656	3,597
Unpaved Road Dust - Test Tracks	265	1,447
Total	**34,016**	**199,307**

Figure 8-1
2026 Controlled Annual PM-10 Emissions in the West Pinal County PM-10 Nonattainment Area

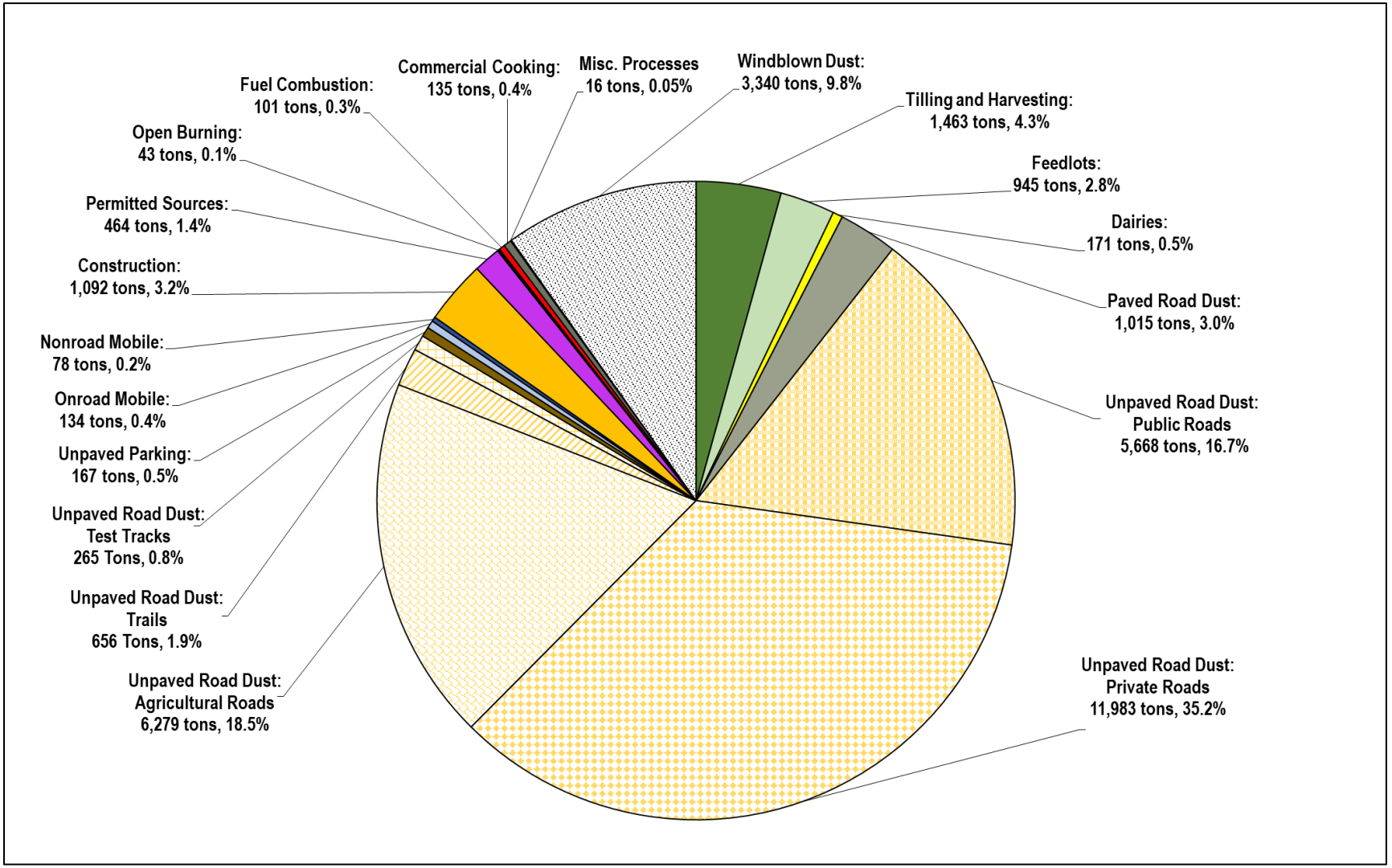
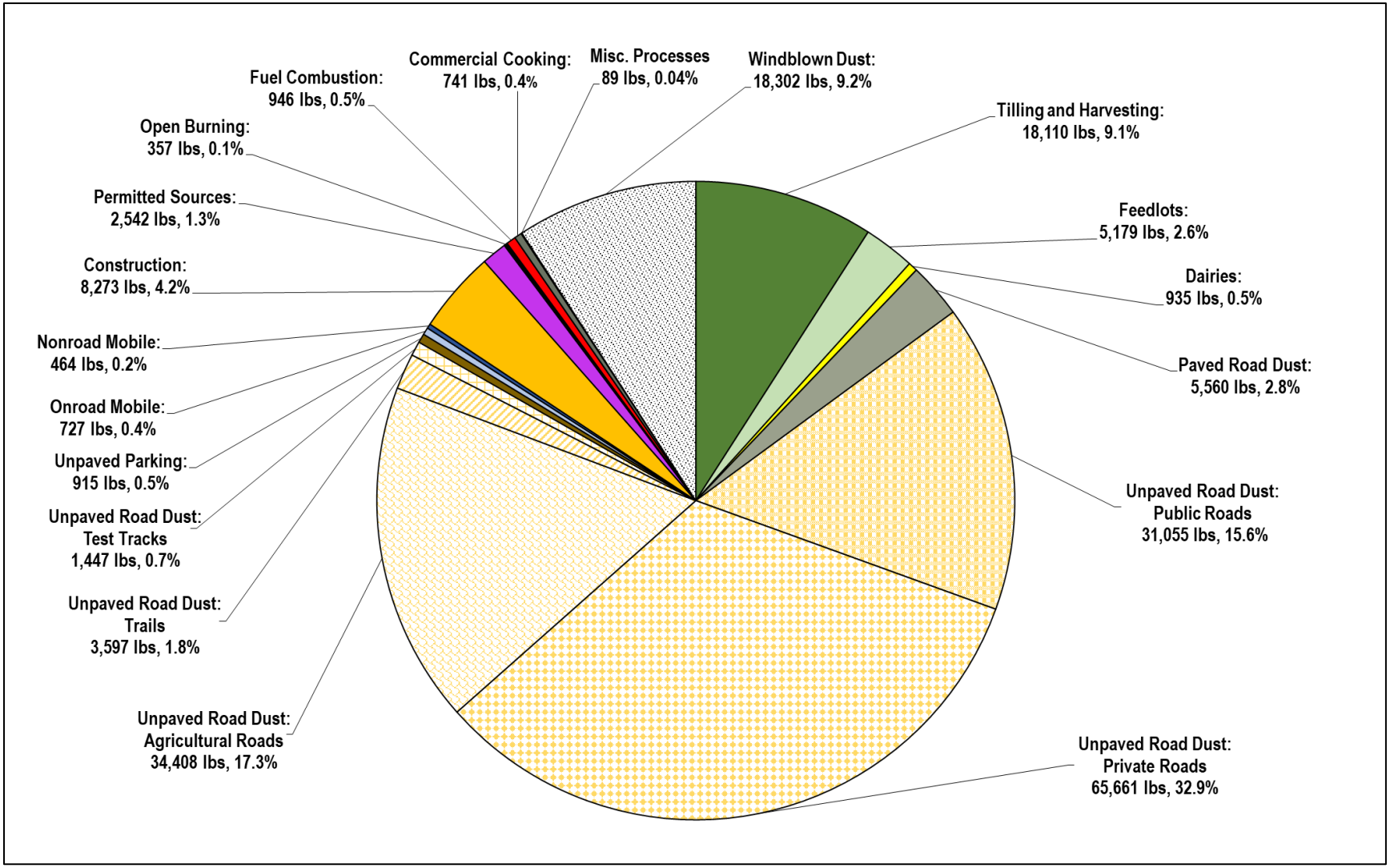


Figure 8-2
2026 Controlled Daily Average PM-10 Emissions in the West Pinal County PM-10 Nonattainment Area



The 2026 controlled annual PM-10 emissions inventory within the West Pinal County nonattainment area totals 34,016 tons. The committed controls in the 2022 Serious Area Plan are the primary source of a reduction of 7,152 tons from the 2017 base year inventory of 41,168 tons. This represents a 17.4% reduction in PM-10 emissions across the nonattainment area as compared to 2017.

AIR QUALITY MODELING ANALYSIS

Conceptual Overview of Attainment Modeling

This section of Chapter 8 provides a general overview of the attainment modeling performed for the 2022 Serious Area PM-10 Plan. Detailed explanation of the modeling is included in the Technical Support Document (Appendix B, Exhibit 1) and associated Modeling Protocol Document (Appendix B, Exhibit 2). In summary, the attainment modeling in this chapter finds that the committed controls included in the 2022 Serious Area PM-10 plan provide for attainment of the PM-10 NAAQS in the West Pinal County nonattainment area in 2026, the most expeditious attainment year available. Attainment is demonstrated using multiple meteorological regimes and PM-10 monitoring locations, ensuring that the controls included in the 2022 Serious Area PM-10 Plan are sufficient to attain the PM-10 NAAQS under a variety of meteorological conditions and throughout the nonattainment area.

Based on a historical review of PM-10 exceedances in the nonattainment area, two general meteorological scenarios are capable of producing PM-10 concentrations which exceed the 24-hour PM-10 NAAQS: (1) elevated winds and (2) low wind, stagnant air. Exceedance days may have varying combinations of hours experiencing these conditions.

During low wind days/hours, elevated PM-10 concentrations are driven by activity-based fugitive dust sources located near the PM-10 monitor. PM-10 concentrations during elevated wind hours are most often related to windblown dust generated emissions from disturbed soils near the PM-10 monitor. When sustained wind speeds at or above 25 mph lead to an exceedance of the PM-10 standard, these exceedances are considered uncontrollable high wind dust events and are therefore excluded from attainment modeling.

There are eight PM-10 monitors within the nonattainment area: Case Grande Downtown, Combs School, Coolidge (discontinued in 2019), Eloy, Hidden Valley, Maricopa, Pinal County Housing, and Stanfield. A map of these monitors has been shown previously in Figure 3-3. Table 8-2 summarizes the type and distribution of PM-10 exceedances by monitoring site in 2016-2018.

Table 8-2
Distribution of 2016-2018 PM-10 Exceedance Days by Type

Monitor	2016-2018 PM-10 Exceedance Days by Type		
	Low Wind/Stagnant	Elevated Wind	High Wind Dust Event
Casa Grande	1	0	11
Combs School	0	1	5
Coolidge	0	0	1
Eloy	2	0	12
Hidden Valley	60	21	16
Maricopa	0	2	8
Pinal County Housing	3	2	17
Stanfield	6	11	25

In order to model attainment in the West Pinal County PM-10 nonattainment area, two general approaches have been identified to address the observed PM-10 exceedances. For low wind, stagnant exceedance days/hours the AMS/EPA Regulatory Model (AERMOD) is used to model the hourly PM-10 concentrations on selected representative design days. For elevated wind days and hours, distance-weighted rollback of source sector-specific contributions will be used to model the hourly PM-10 concentrations on selected representative design days.

The AERMOD modeling approach is selected based on the observation that PM-10 emissions and resulting concentrations in the West Pinal County PM-10 nonattainment area are the result of direct, primary emissions of PM-10 from fugitive dust emission sources. PM-10 precursors have been shown to not significantly contribute to the PM-10 exceedances in the nonattainment area, limiting the usefulness of dispersion models that assume chemical formation of PM-10 through secondary processes.

For assessing PM-10 concentrations from windblown dust, air quality dispersion models have traditionally had poor performance in modeling windblown dust emissions and resulting PM-10 concentrations. Windblown dust models are generally designed to replicate windblown dust concentrations on regional scales and are very poor at replicating windblown dust concentrations at the local scale. Local scale modeling is required for this attainment demonstration, as individual, localized windblown dust sources near the selected PM-10 monitor are the dominant contributor to exceedances.

To address this issue, a distance weighted-rollback methodology was chosen to model PM-10 concentrations from windblown dust emissions (hours when winds speeds are ≥ 12 mph). The rollback approach applies a distance reduction factor to the emissions of each source in the modeling domain to capture the impact of emissions based on the distance between the source and the monitor (i.e., emissions divided by distance from monitor). The underlying assumption behind this approach is that pollutant concentrations are directly proportional to the total emissions over the area of interest (domain) and are inversely proportional to the distance between the source and the monitor. Therefore, the

reduction factor is calculated based on the distance between each source and the impacting monitor.

Three of the eight PM-10 monitors have been selected for inclusion in the attainment modeling: Hidden Valley, Pinal County Housing, and Stanfield. As explained in the discussion on design days, after high wind dust events are removed, the other five monitors in the nonattainment are attaining the PM-10 standard and do not need to be individually modeled. Hourly PM-10 emission inventories for a 4-mile radius modeling domain are developed for each of the selected representative design days. For meteorological inputs, the AERMOD meteorological input data will be developed using the surface monitoring data available from the monitors in the West Pinal County PM-10 nonattainment area and upper air data from Phoenix Sky Harbor Airport and the Tucson upper air monitoring station.

To demonstrate attainment, the AERMOD and rollback modeling will be conducted with the base year emissions scenario (2016-2018) and the attainment year emissions scenario (2026). The attainment year emissions scenario includes the PM-10 emissions reduction benefits of the committed control measures in the plan. The ratio of the AERMOD and rollback modeling results for the two scenarios will be applied to the base design day concentrations (excluding background) for calculating the attainment design day concentrations. Additional details on attainment modeling selection, methodology and performance are provided in the subsequent sections of this chapter.

Modeling Domains

For AERMOD and rollback modeling, modeling domains establish the geographic area surrounding each PM-10 monitor for which emission inventories are developed for each selected design day. For both AERMOD and rollback modeling, a 4-mile radius circle centered on each selected PM-10 monitoring site has been established as the modeling domain. The 4-mile radius circle modeling domain is adequate to demonstrate impacts from local PM-10 contributors for both low wind and elevated wind scenarios. Sources located outside the 4-mile domain are largely considered to contribute at the background level and do not significantly contribute to the exceedances.

The 4-mile domain for elevated wind hours are reduced to that portion of the 4-mile domain that includes the minimum and maximum wind direction vectors observed during all elevated wind hours (≥ 12 mph wind speeds), with the addition of a half-mile buffer to the observed minimum and maximum wind direction vectors. Establishing the elevated wind domain in the manner described above is a conservative approach and captures more windblown PM-10 emissions then prior methods that limit the elevated wind domains to hour-specific wind direction vectors. Figure 8-3 through 8-9 display the low wind and elevated wind modeling domains.

Figure 8-3
Hidden Valley Monitor Low Wind Domain

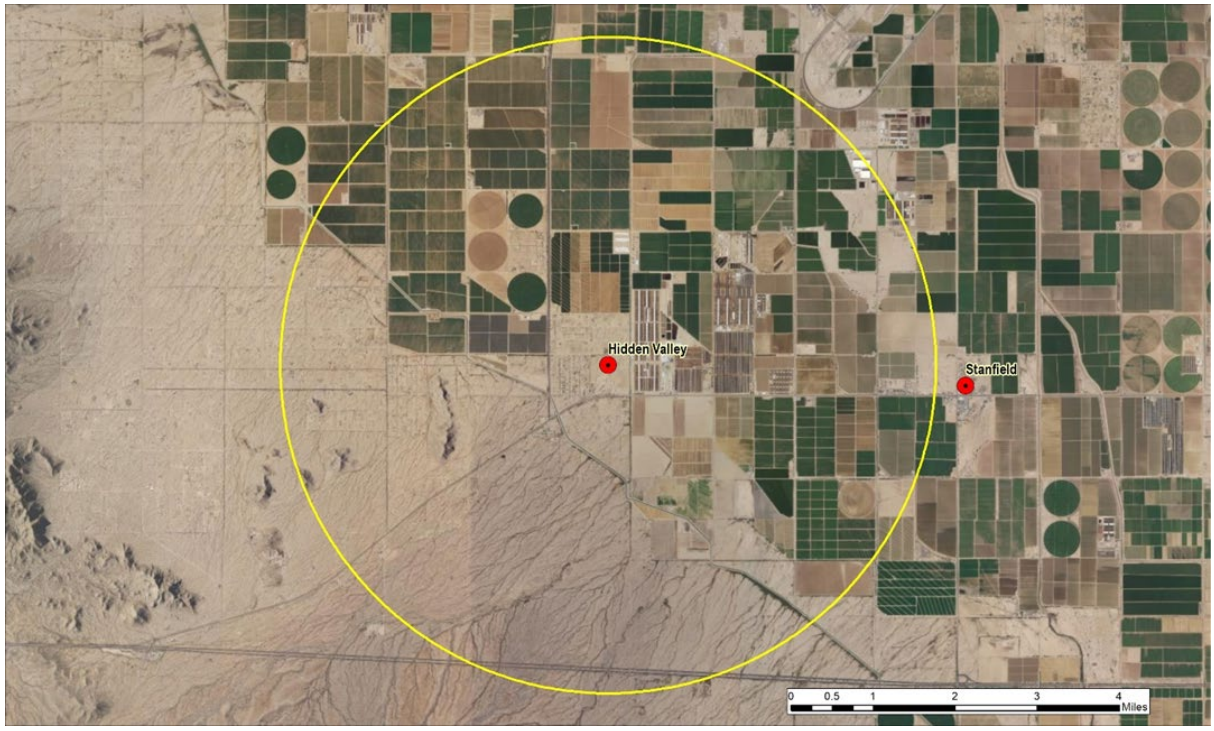


Figure 8-4
Pinal County Housing Monitor Low Wind Domain

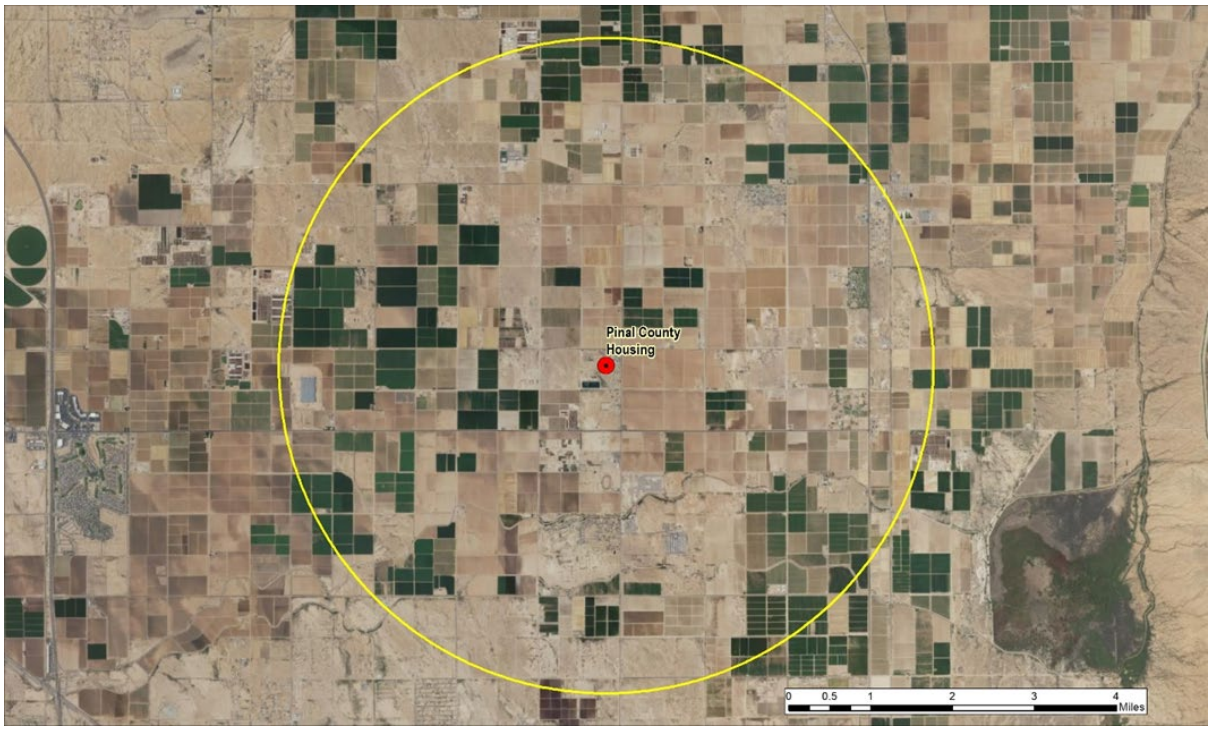


Figure 8-5
Stanfield Monitor Low Wind Domain

Figure 8-6
Hidden Valley August 28, 2017 Elevated Wind Domain

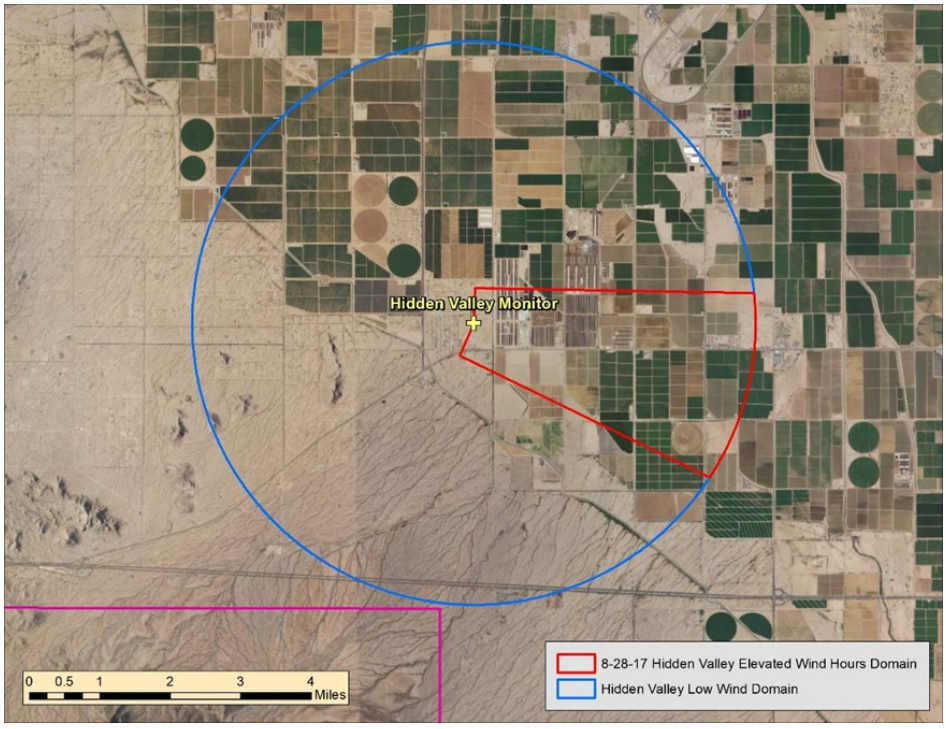


Figure 8-7
Hidden Valley July 6, 2018 Elevated Wind Domain

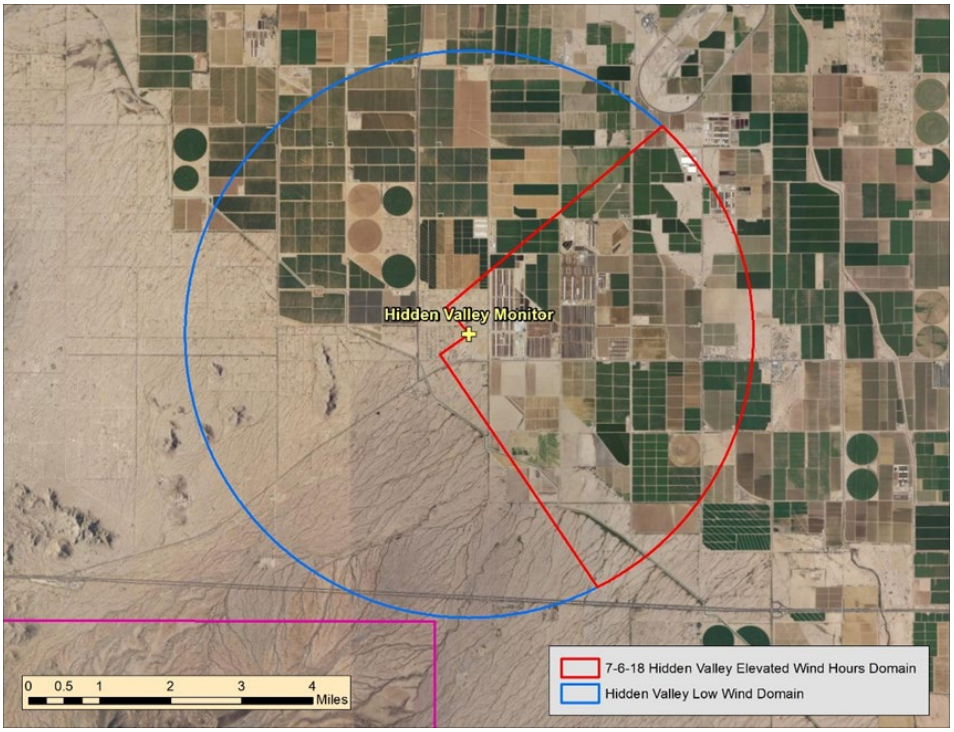


Figure 8-8
Stanfield July 16, 2016 Elevated Wind Domain

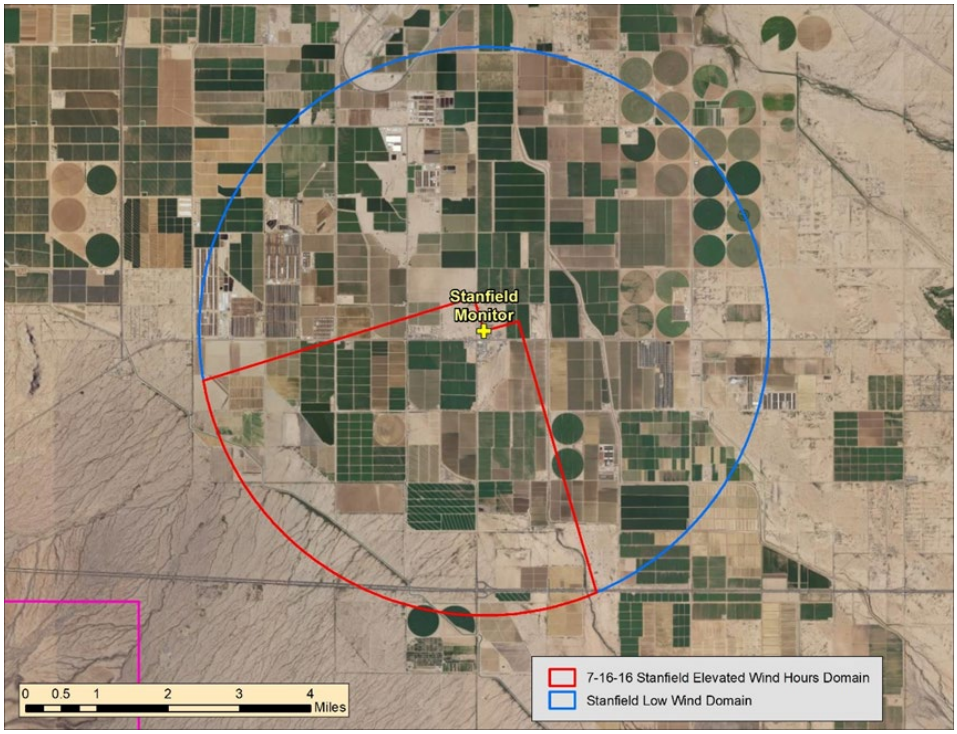
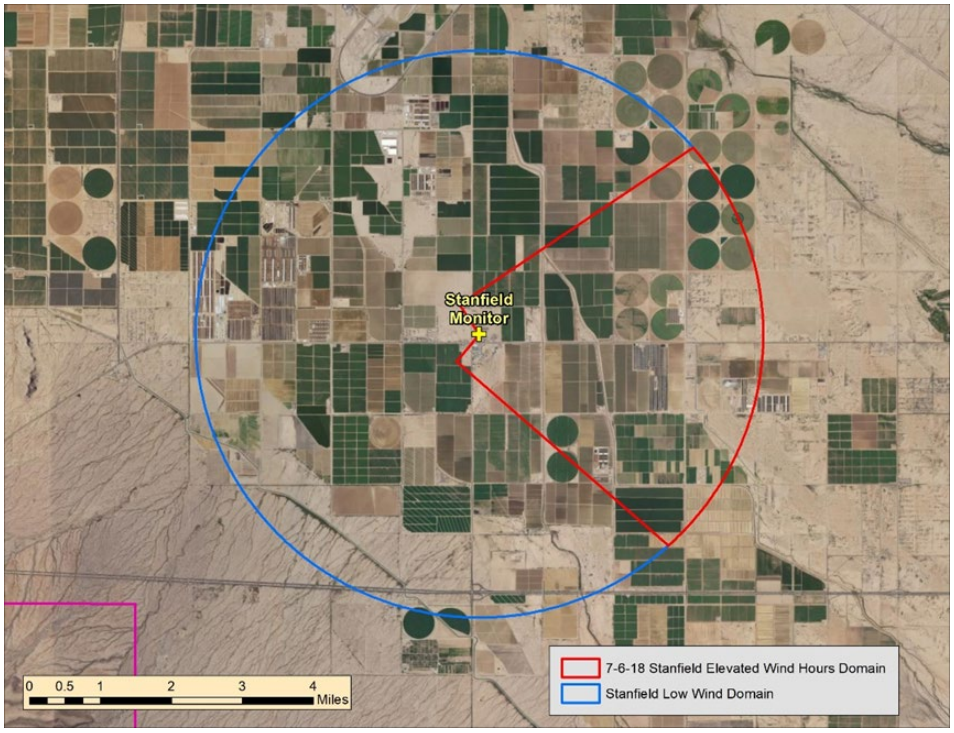


Figure 8-9
Stanfield July 6, 2018 Elevated Wind Domain



Background Concentrations

Background PM-10 concentrations are an essential element of the total air quality concentration considered in the determination of source impacts for attainment modeling. Background concentrations should account for sources not explicitly modeled and should be determined by validated air quality data in the vicinity of the sources, based on recommendations provided in EPA PM-10 guidance. Model results address only the impact of local emissions sources in the modeling domain. Background concentration, which is constant, is not accounted for in the modeled anthropogenic concentration. The impact of regional sources outside the area will be estimated for both elevated wind and low wind exceedance days. The background concentrations estimated for elevated wind and low wind conditions should be added to the corresponding modeled concentrations. Selection of an appropriate background concentration is based on PM-10 observations and meteorological conditions during the three-year period of 2016-2018.

One of the closest PM-10 monitors outside the southern boundary of the West Pinal County nonattainment area, and the most representative of natural sources of PM-10, is the Pinal Air Park site which is located at water well number two within the Pinal Air Park complex (site ID: 040213007). Pinal Air Park lies approximately 20 miles northwest of Tucson, at the border between Pinal and Pima Counties. The site is immediately surrounded by undisturbed desert on all sides, with an industrial park and airport lying to the west. The purpose of this site is to quantify background PM-10 concentrations and

transported ozone concentrations on a regional scale. This site serves as a background particulate matter site for the central and western portion of the county, which is dominated by agriculture and low elevations. This monitor is located approximately 50, 46, and 30 miles from the Hidden Valley, Stanfield, and Pinal County Housing monitors, respectively.

Because the Pinal Air Park site does not record meteorological conditions, meteorological data is obtained from the National Weather Service station located at Marana Regional Airport (KAVQ), approximately 8.6 miles to the southeast. Estimates of background concentrations under elevated wind and low-wind (stagnant) conditions are developed using hourly PM-10 observations from Pinal Air Park, grouped by wind speed and wind direction from the KAVQ station. For elevated wind days, the background concentration is determined to be 17.8 $\mu g/m^3$. For low-wind and stagnation days, the background concentration is determined to be 12.0 µg/m3.

Design Days for Attainment Modeling

The West Pinal County PM-10 nonattainment area was reclassified to a Serious Area due to numerous exceedances of the PM-10 standard at multiple monitors in 2016-2018. These exceedances of the PM-10 standard occurred throughout the year and under varied meteorological conditions. In order to efficiently demonstrate attainment of the PM-10 standard, specific exceedance days that are representative of the different conditions that led to exceedances in the nonattainment area are selected to be modeled as design days in an attainment demonstration. If attainment can be modeled for these representative design days with the committed controls in the plan, it is assumed that the committed controls will be effective at controlling future exceedances.

The exceedance days have been categorized as either a low wind exceedance day (LW), an elevated wind exceedance day (EW), or a high wind dust event (HWDE). Based upon 2016-2018 data, there are five monitors that are attaining the PM-10 standard when HWDE are excluded. The five monitors are: Casa Grande, Combs School, Coolidge, Eloy and Maricopa. Monitoring data from 2019-2020 also demonstrates that these monitors are continuing to attain the standard based upon 2018-2020 data when HWDE are excluded. Design days for attainment modeling are not selected for these monitors.

The remaining three monitors, Hidden Valley, Pinal County Housing and Stanfield, are violating the PM-10 standard based upon 2016-2018 data even with HWDE excluded. Design day candidates have been selected for attainment modeling at these monitors Table 8-3 includes the design days selected for attainment modeling at the three monitors. Additional detail on the selection of design days at Hidden Valley, Pinal County Housing, and Stanfield is contained in the TSD and Modeling Protocol (Appendix B, Exhibit 1 and 2).

Table 8-3
Selected Design Days for Attainment Modeling

Monitor	Date	24-Hr. PM-10 ($\mu g/m^3$)	Exceedance Type
Hidden Valley	June 15, 2017	251	Low Wind
	July 6, 2018	261	Elevated Wind (Low Pressure)
	August 28, 2017	222	Elevated Wind (Thunderstorm)
	October 7, 2017	229	Low Wind
Pinal County Housing	December 1, 2017	185	Low Wind
Stanfield	June 18, 2016	193	Elevated Wind (Low Pressure)
	July 6, 2018	193	Elevated Wind (Low Pressure)
	July 16, 2016	209	Elevated Wind (Thunderstorm)

Design Day Emission Inventories

For the eight selected design days, PM-10 emissions have been developed for all PM-10 source categories present within the modeling domains. In general, design day PM-10 base year emissions (2016-2018) have been developed using the methodologies outlined and summarized in Chapter II of the TSD and explained in detail in the 2017 Base Year Emissions Inventory for the West Pinal County Serious PM-10 Nonattainment Area (Appendix A, Exhibit 1). Similarly, design day PM-10 attainment year emissions (2026) have been developed using the methodologies outlined and discussed in Chapter III of the TSD.

Hourly PM-10 emissions on design days are required as inputs for both the AERMOD and rollback modeling used in the attainment demonstration. When available, local activity has been used to develop diurnal emission profiles for use in allocating daily design day emissions to hourly design day emissions. When local data is not available, default EPA diurnal profiles or other available published diurnal data has been used.

Table 8-4 contains a summary of design day base year and attainment year PM-10 emissions for all eight design days in pounds per day. This design day base year is either 2016, 2017 or 2018 depending on the specific design day, and the design day attainment year is 2026. The design day emissions shown in the tables in this chapter have been used in the attainment modeling.

Table 8-4
Design Day Base Year and Attainment Year PM-10 Emissions from All Sources

Source Category	HV 6-15-17	HV 7-6-18	HV 8-28-17	HV 10-7-17	PCH 12-1-17	ST 6-18-16	ST 7-6-18	ST 7-16-16
Base Year (2016-2018) Design Day PM-10 Emissions (pounds per day)								
Point	5	5	5	5	497	257	257	257
Harvest/Till.	245	242	96	465	860	496	287	624
CAFO/Dairy	3,324	3,337	3,324	3,324	6	6,130	6,130	6,510
Construct.	57	3	35	35	116	2	0	2
NEI	1	1	1	1	2	2	2	2
Open Burn.	128	44	43	101	7	16	72	8
Unpd Park.	45	45	45	45	133	59	59	59
Wind. Dust	NA	38,615	4,973	NA	NA	NA	10,207	3,072
Nonroad	13	10	12	6	5	8	13	15
Exhst./Wear	7	5	6	8	14	11	6	11
Paved Road	51	54	45	50	156	67	56	66
Unpd Ag.	4,734	4,655	4,655	5,764	5,598	7,049	7,049	7,088
Unpd Pub/Pr.	7,028	7,028	7,028	7,028	5,052	3,732	3,732	3,732
Total Base	**15,637**	**54,043**	**20,268**	**16,832**	**12,446**	**17,829**	**27,871**	**21,447**
Attainment Year (2026) Design Day PM-10 Emissions (pounds per day)								
Point	5	5	5	5	414	216	216	216
Harvest/Till.	125	115	45	274	509	239	137	440
CAFO/Dairy	2,405	2,417	2,405	2,405	6	4,338	4,338	4,338
Construct.	56	2	34	34	114	2	0	2
NEI	1	1	1	1	3	3	3	3
Open Burn.	106	36	36	84	6	13	60	7
Unpvd Park.	25	25	25	25	68	31	31	31
Wind. Dust	NA	33,858	4,532	NA	NA	NA	8,944	2,741
Nonroad	7	6	7	4	3	4	7	7
Exhst./Wear	4	5	4	3	18	4	5	3
Paved Road	51	55	45	49	236	52	61	51
Unpvd Ag.	2,928	2,878	2,878	3,564	3,462	4.359	4,359	4,398
Unpvd. Pub.	3,655	3,655	3,655	3,655	4,867	2,563	2,563	2,563
Total Attain.	**9,369**	**43,058**	**13,672**	**10,103**	**9,707**	**11,824**	**20,724**	**14,800**

Selected Air Quality Models

As discussed in brief above, air quality modeling was conducted to quantitatively assess the impact of the control measures on the PM-10 concentrations in the base and control years. Air quality modeling consisted of AERMOD air dispersion model and rollback analysis. The selected design days were classified into elevated wind design days and low-wind design days. The elevated wind design days included a combination of elevated wind speed hours (with average wind speeds from 12-25 mph) and low-wind hours (with averaging wind speed less than 12 mph). The low-wind design days consisted of only low-wind speed hours with average wind speeds less than 12 mph. During elevated wind hours, fugitive PM-10 is produced due to a combination of both mechanical or activity-driven sources and wind entrainment, while fugitive PM-10 is produced solely due to mechanical sources during low-wind speed hours.

The AERMOD model was used as the primary basis for modeling the effects of control measures for activity-based emission sources during low-wind speed hours. For fugitive dust-driven impacts, EPA and other relevant studies in the literature have established poor model performance associated with the AERMOD model. This was mainly attributed to the model's inability to model PM-10 concentrations produced due to wind entrainment during elevated wind speed hours. To limit impacts of bias introduced by AERMOD underperformance in the overall modeling, a hybrid approach was employed for elevated wind speed hours. This hybrid approach combined AERMOD modeled concentration for low-wind speed hours and rollback analysis for elevated wind speed hours for evaluation of control measures. In addition to the hybrid approach, additional analyses were performed to strengthen the validity of the approaches developed to address the AERMOD underperformance issues. This section describes the air quality modeling approaches and provides a high-level overview of the additional analyses conducted. A detailed description of the input data, assumptions, and procedures used in the air quality modeling is presented in the TSD (Appendix B, Exhibit 1).

AERMOD Modeling

The AERMOD air dispersion modeling was performed with the AERMOD (version 21112) dispersion model in combination with AERMOD preprocessors for meteorological and land use data processing. Hourly PM-10 emissions data from different sources within the modeling domain of the three monitoring sites were processed in a format compatible with AERMOD. The monitoring sites were modeled as rural based on their population density. The AERMOD's particle deposition and dry depletion was activated to simulate the impact of particle settling and removal on calculated PM-10 concentrations. This was due to the arid environmental conditions of the monitoring sites, PM-10 being modeled consisted of coarser particles that have a shorter lifetime (minutes to hours) and travel distances (<10's of km), and removal of dust storms (that tend to reduce deposition) as exceptional events in the selection of design days. The particle properties were defined based on EPA's default properties. The emission sources were characterized as area, volume, or line based on their corresponding source characteristics. Dispersion or release

parameters (the initial lateral (σ_y), and initial vertical dimensions (σ_z), and release height) impacting pollutant dispersion were defined based on the source location, source type, and geometry. Discrete receptors were placed at the Hidden Valley, Stanfield, and Pinal County Housing monitoring site locations at an elevation of 406.2 meters, 397.5 meters, and 442.2 meters, respectively. The AERMOD modeled concentrations were obtained at these discrete receptor locations for both the base and control years.

Meteorological data was obtained from two sources of data. Upper air data was obtained from the Tucson station located close to the monitoring sites, and onsite surface data was obtained from the monitoring sites at Hidden valley, Stanfield, and Pinal County Housing. Onsite meteorological data from the monitoring sites were processed in a format compatible with AERMOD using meteorological preprocessors (AERMET, AERSURFACE, and AERMINUTE). The resulting meteorological output files (surface and profile data files) were incorporated into AERMOD. Missing meteorological data was processed using AERMOD's regulatory calm and missing data processing routine that computed shorter term averages based on non-missing hours of data. One of the key parameters affecting pollutant dispersion is wind speed and wind direction. The hourly wind speed determined the classification of the hour based on the threshold limit of 12 mph as low and elevated wind speed hours that determined the type of air quality modeling performed. The wind roses plotted for the monitoring sites exhibited variable wind conditions with changes in the predominant wind direction. The predominant wind direction was key in determining which sources were upwind and impact the ambient concentrations at the monitoring sites.

Rollback Analysis

The rollback analysis was utilized for modeling the impact of control measures for elevated wind speed hours. In its basic form, rollback assumes the pollutant concentration to be a linear function of the total emission rate of the pollutant holding background concentration and meteorology constant. The rollback is broadly categorized into simple and distance-weighted approaches. In the former approach, concentrations were assumed to be directly proportional to total emissions irrespective of the spatial distribution of emission sources, and in the latter approach, emissions were weighted by the reduction factor. The key inputs for rollback analysis consisted of emission inventories from all sources that impact the monitoring sites, background concentration, and reduction factor in the case of distance weighted approach. The rollback approach and reduction factor were based on prior analysis approved by EPA to demonstrate PM-10 attainment by MAG in their Five Percent Plan for the Maricopa County nonattainment area, and by the Clark County Department of Air Quality for PM-10 attainment demonstration in the Clark County, Nevada. Based on the similarities between these prior analyses and West Pinal County in terms of environmental conditions, the reduction factor based on the distance between the centroid of emission sources to the monitoring site was adopted for attainment modeling.

Background concentration represents regional pollutant concentrations from sources

outside the modeling domain surrounding the monitoring sites. The background concentration was obtained from a representative ambient monitoring site situated upwind in similar land use conditions as the monitoring sites. The Pinal Air Park served as the representative monitor with a background concentration of 12.0 µg/m^3 for low-wind speed days and 17.8 µg/m^3 for elevated wind speed days (consisting of a combination of low and elevated wind speed hours). The estimated background concentration was not expected to be impacted by reductions from control measures adopted under this plan. Accordingly, the background concentration was assumed to be the same for both base and control years.

Analyses Conducted to Address Model Underperformance

To address the AERMOD underperformance issues in modeling fugitive dust impacts produced by wind entrainment, the following analyses were performed to optimize model performance in comparison with the monitored concentration and provide confidence in the final "mainline" method developed to demonstrate attainment.

Model Performance Optimization

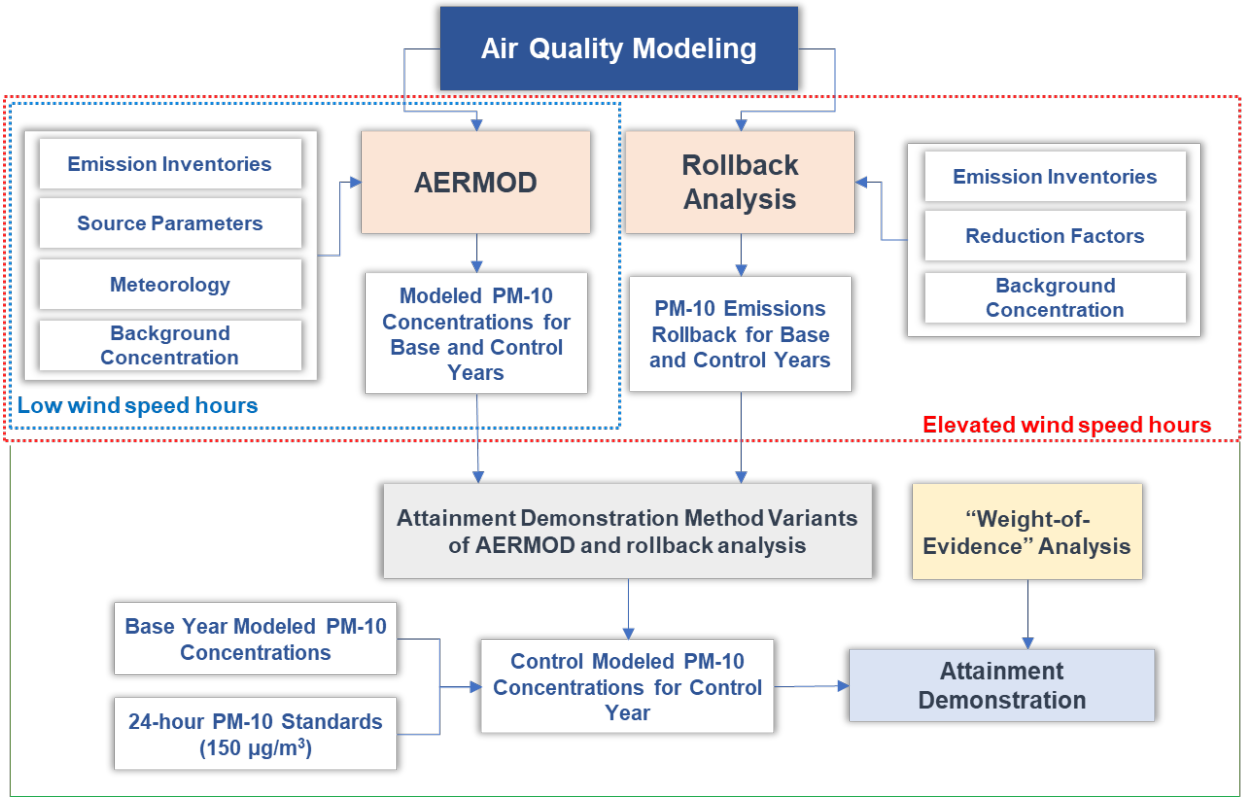
- Rigorous evaluation of the AERMOD model was conducted through sensitivity analysis of alternative input parameters that were found to have an impact on model performance based on studies in the literature. Based on the evaluation explained in the Technical Support Document, a final set of input parameters was utilized for the AERMOD model runs.
- Model adjustment factors (MAFs) were developed to adjust base year AERMOD modeled PM-10 concentrations to match monitored observations after accounting for background concentration. The same design day-specific MAFs from the base year were applied to the control year to develop model performance adjusted PM-10 concentrations for attainment demonstration.

Attainment Modeling

- A hybrid approach was adopted for attainment demonstration based on a combination of AERMOD and rollback analysis for elevated wind speed hours.
- Due to the inability of AERMOD in reliably modeling observed PM-10 concentrations, several variants based on AERMOD concentrations and rollback analysis were developed. The objective of this exhaustive evaluation was to examine each method and results and to choose the best method for attainment demonstration.
- In addition to the several method variants developed for attainment modeling, a wide range of "weight-of-evidence" analyses was also conducted to reinforce assurance in the selected "mainline" attainment demonstration approach. These analyses relate to performing a "pure" emissions-based rollback analysis, modeling of PM-10 concentrations at unmonitored locations, evaluating the implications of excluding carryover-based adjustments to address AERMOD underperformance issues, and applying conservative control measure assumptions. The methods and their findings are summarized in the section on "Weight-of-evidence".

The overall air quality modeling and attainment demonstration performed for all design days is graphically represented in Figure 8-10.

Figure 8-10
Air Quality Modeling and Attainment Demonstration



Air quality modeling was performed by classifying the wind speed hours based on the wind speed threshold as low-wind speed hours (< 12 mph) and elevated wind speed hours (> 12 mph). AERMOD modeling was conducted for low-wind speed hours based on input parameters related to the emission inventories, source parameters, meteorology, and background concentration.

Based on these inputs, AERMOD computed PM-10 concentrations at the discrete receptors placed at the monitoring stations for the base and control years. To address AERMOD's underperformance issues, a hybrid approach combining AERMOD concentration for low-wind speed hours and rollback analysis for elevated wind speed hours was utilized. The rollback approach computed emission rollback based on emission inventories between the base and control year, reduction factors, and background concentration. The 24-hour base and control year concentrations from air quality modeling were adjusted using the Model Adjustment Factors (MAFs) to match the base year with monitored concentrations after accounting for background concentration.

Attainment modeling was performed based on adjusted base and control year modeled concentrations using several methods (and method variants) based on combinations of AERMOD concentrations and rollback analysis. To broaden the examination of attainment, a series of analyses was conducted to provide additional confidence in "mainline" approach selected for attainment demonstration. The resulting control modeled PM-10 concentrations was evaluated with the base year modeled PM-10 concentrations, and 24-hour PM-10 standard. Results of the attainment demonstration and "Weight of Evidence" evaluations are discussed in the following sections.

2026 ATTAINMENT DEMONSTRATION

The attainment date for the 24-hour PM-10 standard for the West Pinal Serious PM-10 nonattainment area was December 31, 2022. However, an extension of the attainment year up to five years (from December 31, 2022, to a maximum of December 31, 2027) was provided by the Clean Air Act due to the infeasibility for the nonattainment area to demonstrate attainment by December 31, 2022. Based on the committed control measures combined with the maximum expeditious implementation schedules developed in consultation with various implementing agencies, and attainment modeling conducted for 2025, 2026, and 2027, the attainment year was iteratively determined to be 2026.

To demonstrate attainment of the 24-hour PM-10 standard in attainment year, the control modeled concentrations should not exceed 154 $\mu g/m^3$ at monitors in the modeling domains on the selected design days. (Since the 24-hour PM-10 standard is significant to 5 $\mu g/m^3$, concentrations at or above 155 $\mu g/m^3$ represent exceedances of the standard.) Evaluation of attainment was conducted using different methods based on various combinations of AERMOD modeling and rollback analysis. Based on the robustness of the methods, and a thorough evaluation of the results, the final "mainline" approach was selected for attainment demonstration.

The summarized "mainline" method-based results for the control year 2026 is shown in Table 8-5. For each design day, baseline 24-hour PM-10 monitored design values (or base year modeled PM-10 concentrations adjusted to match the design values based on MAFs) are shown along with the 24-hour control modeled PM-10 concentrations, and relative concentration reductions between control year and base year.

The control modeled 2026 control year 24-hour PM-10 concentrations based on the "mainline" method for all design days are below the PM-10 standards of 150 $\mu g/m^3$ standard. The highest modeled 2026 control year concentration across all design days was 144.9 $\mu g/m^3$ at the Pinal County Housing monitor for the 12/01/2017 design day. The results obtained for variants of the "mainline" method also exhibited the control modeled 2026 control year 24-hour PM-10 concentration for all design days to be below the PM-10 standards of 150 $\mu g/m^3$ and demonstrates that the control measures adopted will achieve attainment by the control year. Details of the "mainline" method and its variants and results are described in detail in the Technical Support Documentation (Appendix B, Exhibit 1).

Table 8-5
Summary of Modeled Attainment Demonstration ("Mainline" Approach)

Design Day	Baseline 24-Hour PM-10 Design Value ($\mu g/m^3$)	Control Year 2026	
		Controlled 24-Hour PM-10 Concentration ($\mu g/m^3$)	Relative Reduction Control vs Baseline PM-10 (%)
HV, 07/06/2018	261.6	117.9	54.95%
HV, 06/15/2017	251.7	44.9	82.17%
HV, 10/07/2017	229.1	59.8	73.91%
HV, 08/28/2017	222	101.7	54.19%
ST, 07/16/2016	209.9	120.2	42.75%
ST, 07/06/2018	193.5	121.7	37.09%
ST, 06/18/2016	171.1	122.4	28.46%
PCH, 2/01/2017	185.7	144.9	21.94%

Confirmation of Nonattainment Area-Wide Attainment

As discussed above, attainment modeling was performed for the three monitoring sites that violated the PM-10 NAAQS based upon monitoring data from 2016-2018: Hidden Valley, Pinal County Housing and Stanfield. For the other five nonattainment area monitoring sites that did not violate the PM-10 NAAQS, EPA recommended using an analysis of base year and attainment year emission inventories to evaluate whether attainment of the PM-10 NAAQS can continue to be expected at these five monitors.

As discussed in the beginning of this Chapter, the committed controls in this 2022 Serious Area PM-10 Plan contribute to a 17.4% reduction in PM-10 emission across the nonattainment area in 2026 as compared to 2017 base year emissions. Given this significant reduction in nonattainment area-wide emissions occurs across a broad range of PM-10 source categories, there is no evidence to suggest that emissions would increase at any of the non-modeled monitoring locations. Therefore, it is expected based upon emissions inventory data that these monitors will continue to attain the PM-10 NAAQS with implementation of the committed control measures.

Attainment Modeling Conclusions

As discussed above, the "mainline" hybrid AERMOD/roll-back episodic modeling, incorporating the applicable committed control measures, demonstrates that the West Pinal County nonattainment area should attain the 24-hour PM-10 standard by December 31, 2026, which is expeditiously as possible. The episodic modeling evaluated attainment across eight design days encompassing the three ambient monitors in the region where

violations of the 24-hour PM-10 standard have been recorded. From this modeling, the peak 24-hour maximum PM-10 concentration was estimated to be less than the 150 $\mu g/m^3$ standard by 2026.

It is important to note that the committed control measures discussed in Chapter 7 are legally enforceable commitments that will continue to provide air quality benefits beyond the attainment date. The strength and number of commitments provided the implementing entities provide confidence in the attainment demonstration and the prospect for clean air in the future.

WEIGHT OF EVIDENCE

Due to the inconsistent performance of AERMOD in matching monitored concentrations, a range of analyses was performed to provide additional "weight-of-evidence" to the "mainline" attainment demonstration. These additional factors are described in this section.

Multiple AERMOD-Based Attainment Demonstration Methods

Attainment demonstration was performed using a variety of methods and method variants for all design days. These methods were based on combinations of AERMOD concentrations, and rollback analysis (simple and distance weighted). Results obtained from the chosen "mainline" method for attainment demonstration and other methods show the controlled modeled PM-10 concentrations for all design days to be lower than the base year modeled PM-10 concentrations and PM-10 standards. The findings from this exercise demonstrated that the control measures adopted will achieve attainment by the control year.

Full Emissions-Based Rollback Analysis

In addition to multiple AERMOD-based attainment demonstration methods, a complete emission-based rollback analysis based on only emission inventories was conducted as an additional weight of evidence in demonstrating attainment. The base and control year emissions for all PM-10 emission sources within the modeling domain were calculated based on simple and distance-weighted 24-hour emissions rollback approaches. The control year concentration was estimated by applying a linear rollback (emission reductions between the base and control years) to the base year PM-10 concentration after accounting for background concentration. The results based on the distance-weighted approach found only one design day 07/06/2018 at the Hidden Valley monitoring site to exceed the PM-10 standard and the remaining design days to demonstrate attainment. Given that PM-10 concentrations on exceedance days at the Hidden Valley monitor are extremely local in nature and are caused by significant PM-10 emission sources located very near the monitor (within a mile), not accounting for wind direction severely misrepresents the benefits of the committed control measures. The fact the most days still show attainment without accounting for wind direction provides

additional weight of evidence that the emissions reductions resulting from the implementation of controls are likely to result in attainment.

Unmonitored Area Impacts

Modeling of PM-10 concentrations were performed for unmonitored locations to assess the spatial gradients in concentrations around the monitoring sites. A square variable density grid receptor mesh of 92 receptors was placed at varying spacing radiating from the monitoring site at the center and extending beyond the modeling domain's 4-mile circular radius. The gird receptor modeling was conducted for the Hidden Valley monitoring site for the base year and 07/06/2018 design day. The highest raw[13] PM-10 concentration was obtained at a receptor located 1.5 miles southeast of the Hidden Valley monitoring site. The concentration contour plot and contour plot overlaid on Google Earth imagery is shown in Figure 8-11, which shows the location of the modeling receptor with the highest AERMOD-predicted concentration as a red dot just south of Arizona Route 84 along with the location of the Hidden Valley monitor.

Figure 8-11
PM-10 Concentration Contour Plot with Valid Receptors for Hidden Valley Monitoring Site on July 06, 2018

This highest concentration of 84.8 ug/m^3 was found to be in reasonable agreement with the raw concentration of 78.6 ug/m^3 observed at the Hidden Valley monitoring site with

[13] Raw concentrations refer to those directly calculated by AERMOD without adjustment for model underperformance.

the modest increase of 8% likely to be within the expected accuracy of the model. This exercise highlighted two key findings, (a) Hidden Valley monitor is appropriately sited to capture local impacts from sources within the modeling domain under exceedance conditions, and (b) controls being adopted for the modeling domain and across the nonattainment area under the 2022 Serious Area SIP based on the maximum baseline design values observed at the Hidden Valley monitor is likely to be sufficient to reduce the monitored PM-10 concentrations below the 24-hour standards across the nonattainment area.

Implications of Excluding Carryover-Based Adjustments

In prior modeling conducted in support of the 2015 West Pinal Moderate PM-10 Nonattainment Area SIP, ADEQ's methodology utilized the concept of "carryover" to account for the underperformance issues with AERMOD. This concept consisted of accounting for carryover impacts of emissions from the previous hour that remain suspended near the monitor under very low-wind conditions to the impacts estimated for the current hour. Based on MAG's evaluation, the carryover methodology was not adopted for the 2022 Serious Area PM-10 attainment demonstration. This was because the model evaluation exercise did not find a consistent trend in the mismatch between AERMOD modeled and monitored concentrations and wind conditions and therefore it could not be established that very low/calm wind speeds caused AERMOD underperformance. Considering this and sensitivity analysis that found particle deposition to be significant in all wind conditions, applying a carryover adjustment specific to low-wind speeds could artificially influence the attainment modeling results.

Conservative Control Measures Assumptions

Several conservative assumptions were made in estimating rule and resultant control effectiveness during the development of the controlled inventories used to model future year attainment. These conservative assumptions are summarized below in support of the weight of evidence of the attainment demonstration.

- *Public Unpaved Road Speed Limit* – Findings of the BACM/MSM control measure analysis included a provision to limit speeds on unpaved public roads to 25 mph. Modeling of this measure left average vehicle speeds as they were observed in 2013, ranging from 29 to 47 mph.

- *"Maximum Individual BMP" Control Efficiencies* – In evaluating control reductions from BACM required multiple Best Management Practices (BMPs) for commercial farm road and crop activity and windblown dust controlled emissions, MAG opted to calculate control efficiencies conservatively based on the maximum individual control efficiency across multiple BMPs. This underrepresents the resultant control efficiency of the application of multiple BMPs when they do not fully overlap under a "combined" control efficiency-based approach.

- *Rule Effectiveness Estimates* – In estimating rule effectiveness for a number of measures, MAG generally assumed values toward the lower end of ranges established under EPA outlined criteria.[14] This reduces the control effectiveness of adopted controls and ensures controlled emissions were not underestimated.

- *Future Year Activity Projections* – When activity-specific projections were not available, projections that resulted in higher future year activity levels were chosen as surrogates (e.g., using population for construction activity, paved road vehicle miles traveled for public unpaved roads, etc). This ensures that the maximum expected emissions in future years is captured.

- *For several of the committed BACM/MSM control measures, future emission reductions were not evaluated* – Of the 61 suggested measures that were included as committed controls, only 48 were quantified (see Table III-1). When emission reductions from committed controls could not be readily quantified, the decision was made to not include emission reductions for those measures even though they are expected to reduce future emissions.

EXPEDITIOUS ATTAINMENT

Increases in compliance and penetration levels for committed control measures over the period 2022 through 2026 will ensure that the PM-10 standards are achieved by 2026. However, more expeditious attainment is not possible. Many of the key control measures will not be fully implemented until after 2024, and for others, maximum compliance will not be achieved until 2026.

Because the form of the PM-10 NAAQS only allows three PM-10 exceedances per 3-year period, in order to attain by December 31, 2026, clean monitoring data is needed for the period of 2024-2026. Attainment modeling results in 2026 indicate that full implementation of all the committed control measures is needed to demonstrate attainment. As 2024 is the first year full implementation of control measures is anticipated, the earliest 3-year period attainment could occur would be 2024-2026. As such, December 31, 2026 has been identified as the most expeditious attainment date possible.

REASONABLE FURTHER PROGRESS AND MILESTONES

Clean Air Act Section 172(c)(2) requires nonattainment area plans to include provisions that require Reasonable Further Progress (RFP). Section 171(1) of the Clean Air Act further defines RFP as “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient

[14] “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations, Appendix B: Revised Rule Effectiveness Guidance,” U.S. Environmental Protection Agency, 2005.

air quality standard by the applicable date." The modeling results presented in the 2022 Serious Area PM-10 Plan demonstrates that the West Pinal County nonattainment area will meet the PM-10 standard by December 31, 2026, the most expeditious attainment date possible.

Additionally, Section 189(c)(1) of the Clean Air Act requires particulate matter nonattainment area plans to include "quantitative milestones which are to be achieved every 3 years until the area is redesignated attainment and which demonstrate reasonable further progress." In the general preamble for the implementation of the Clean Air Act Amendments of 1990, it is stated that "There is a gap in the law that the text of section 189(c) does not articulate the starting point for counting the 3-year period. The EPA believes it is reasonable to begin counting the 3-year milestone deadline from the due date for applicable implementation plan revisions containing the control measures for the area." (57 FR 13539). Using this guidance, the starting date for milestones would be January 2, 2014 - the due date of the first PM-10 state implementation plan revision for the West Pinal County Moderate PM-10 nonattainment area (77 FR 32024). The first milestone date is therefore January 2, 2017, with additional milestones continuing every three years until attainment in 2026 (2020, 2023,and 2026).

To demonstrate RFP, annual incremental reductions in PM-10 emissions within the West Pinal County nonattainment area are shown starting with the base year of 2017 until the attainment year of 2026. Annual controlled nonattainment area emissions in 2027 are also shown to demonstrate that Reasonable Further Progress will continue beyond the attainment year of 2026. 2027 emissions were developed as part of the modeling work to determine the earliest year that attainment could be modeled and demonstrated. Additional details on the development of these emissions are included in the Technical Support Document (Appendix B, Exhibit 1).

Annual nonattainment area PM-10 emissions for years 2018-2025 were initially grown based upon annualized projection factors. For years 2018-2021, the emission reduction benefits of Moderate Area controls were included in the annual emissions. Beginning in 2022, the benefits of committed BACM and MSM measures for agricultural sources (harvesting and tilling, CAFOs, dairies, and unpaved agricultural roads) were included as the State rules for these sources are in place in 2022. All other committed BACM and MSM control measures are assumed to be fully implemented beginning in 2024, based upon the measure commitment schedule provided by the PCAQCD. Additionally, for source categories that include an increase in rule effectiveness percentages from 2017 base case emissions until 2026 controlled attainment year emissions, the rule effectiveness percentages were incrementally increased in years 2022-2026 for RFP calculations. For example, for CAFOs and dairies, 2017 base case rule effectiveness was estimated to be 50%. 2026 controlled attainment year rule effectiveness was estimated to be 75%. In the RFP calculations, rule effectiveness is estimated to be 60% in 2022-2023 and 70% in 2024-2025.

Table 8-6 includes a listing of the annual West Pinal County nonattainment area PM-10

emissions for years 2017-2027 by source category. Table 8-6 indicates that the requirement to demonstrate Reasonable Further Progress is met, as incremental reductions in PM-10 emissions are calculated for each year from 2017-2027. The total annual PM-10 emissions in the West Pinal County nonattainment area that demonstrate Reasonable Further Progress from 2017-2027 are also shown in Figure 8-12.

As part of the requirements related to contingency measures, EPA guidance recommends that contingency measures should provide for PM-10 emission reductions equal to one year's worth of Reasonable Further Progress. Based upon the total annual emissions shown in Table 8-6, 2017 base case annual PM-10 emissions for the nonattainment area are 41,168 tons and 2026 controlled, attainment year emissions are 34,016 tons. Based on these two figures, one year's worth of RFP is equal to 795 tons. The contingency measure(s) in the 2022 Serious Area PM-10 Plan should contain PM-10 emissions reductions greater than or equal to 795 tons.

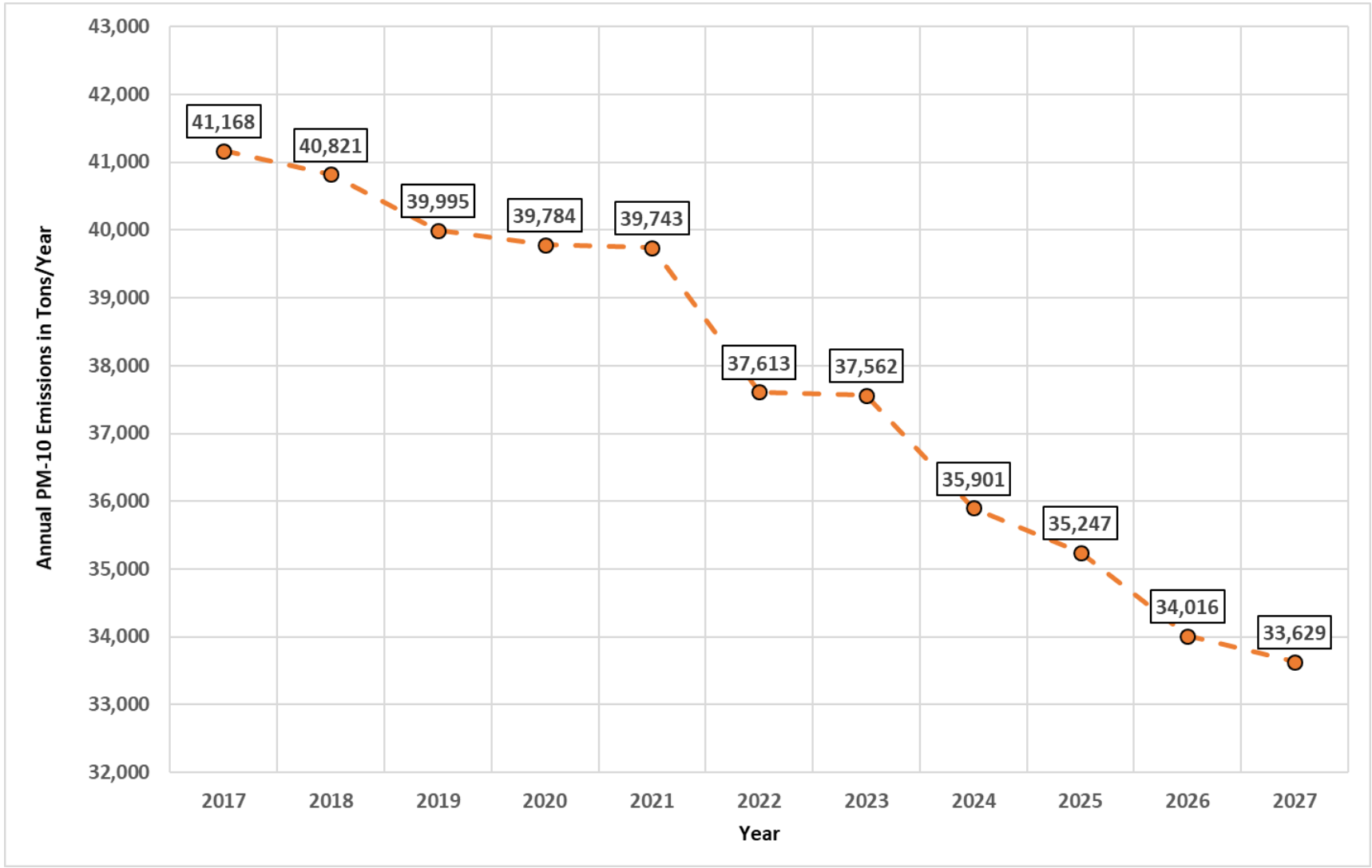
Lastly, Clean Air Act Section 189(c)(2) requires that no later than 90 days after a milestone date, that State shall submit to the Administrator a demonstration that the milestone has been met. Since the 2017 and 2020 milestones have already occurred, the 2017 PM-10 base year emission inventory (Appendix A, Exhibit 1) and the 2020 emissions developed above for the RFP calculations included in this plan meet the reporting requirements for these milestones. The 2017 and 2020 PM-10 emissions have been developed with the latest available information and represent the best estimates of 2017 and 2020 emissions. For the 2023 milestone, a report shall be prepared and submitted to EPA by April 1, 2024; and for the 2026 milestone a report shall be prepared and submitted to EPA by April 2, 2027. These reports will quantify the annual PM-10 emissions in the nonattainment area (with implementation of the committed measures) as compared to the 2023 and 2026 milestone emissions shown in Table 8-6

Table 8-6
2017-2027 West Pinal County Nonattainment Area Annual Reasonable Further Progress PM-10 Emissions

Reasonable Further Progress - Annual PM-10 Emissions for the West Pinal County Nonattainment Area											
Emissions Source Category	**Moderate Area Controls in Place**					**BACM/MSM Control Implementation**					
	2017*	**2018**	**2019**	**2020***	**2021**	**2022**	**2023***	**2024***	**2025**	**2026***	**2027**
Tilling and Harvesting	2,051	2,010	1,970	1,930	1,892	1,752	1,716	1,584	1,552	1,463	1,458
Feedlots	1,353	1,334	1,316	1,297	1,279	1,086	1,071	1,000	986	945	945
Dairies	185	185	185	185	185	178	178	173	173	171	171
Paved Road Dust	816	852	890	929	970	1,013	1,058	974	990	1,015	1,041
Unpaved Road Dust - Public Roads	6,654	6,606	6,067	6,134	6,362	6,235	6,405	6,325	5,934	5,668	5,241
Unpaved Road Dust - Private Roads	12,961	12,848	12,737	12,626	12,517	12,408	12,301	12,194	12,088	11,983	11,976
Unpaved Road Dust - Agricultural Roads	10,150	9,947	9,747	9,552	9,360	8,005	7,845	6,922	6,783	6,279	6,256
Unpaved Road Dust - Trails	656	656	656	656	656	656	656	656	656	656	656
Unpaved Road Dust - Test Tracks	265	265	265	265	265	265	265	265	265	265	265
Unpaved Parking	304	308	313	318	323	328	333	218	184	167	172
Onroad Mobile	162	158	155	152	149	146	143	140	137	134	136
Nonroad Mobile	102	99	96	93	90	88	85	83	80	78	76
Construction	1,109	1,147	1,187	1,228	1,270	1,314	1,360	1,262	1,305	1,092	1,129
Permitted Sources	466	466	465	465	465	465	464	464	464	464	463
Open Burning	44	43	43	43	43	43	43	43	43	43	43
Fuel Combustion	75	77	80	83	85	88	91	95	98	101	105
Commercial Cooking	100	103	107	110	114	118	122	126	131	135	140
Miscellaneous Non-Industrial Processes	12	12	13	13	14	14	15	15	16	16	17
Windblown Dust	3,705	3,704	3,704	3,704	3,704	3,411	3,411	3,362	3,362	3,340	3,339
TOTALS	**41,168**	**40,821**	**39,995**	**39,784**	**39,743**	**37,613**	**37,562**	**35,901**	**35,247**	**34,016**	**33,629**

*Note: 2017, 2020, 2023, and 2026 are quantitative milestone years.

Figure 8-12
Reasonable Further Progress Demonstration



CONTINGENCY MEASURES

Section 172(c)(9) of the Clean Air Act requires that the SIP for each nonattainment area "provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the [NAAQS] by the attainment date applicable under [part D of title I]" and requires that these measures "take effect without further action by the State or EPA." Consistent with the text of Section 172(c)(9), these measures must be specific, adopted measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date.

EPA provided guidance on the Section 172(c)(9) contingency measure requirement in an interpretative document entitled "State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990," 57 FR 13498 (April 16, 1992) ("General Preamble"). As EPA explained in the General Preamble, "contingency measures should, at a minimum, ensure that an appropriate level of emission reduction progress continues to be made if attainment [or] RFP is not achieved and additional planning by the State is needed" (57 FR 13498, 13511).

The Clean Air Act does not specify how many contingency measures are required or the magnitude of emission reductions that must be provided by these measures. However, with respect to the level of emission reductions associated with contingency measures, EPA has recommended that states consider "the potential nature and extent of any attainment shortfall for the area" and the amount of actual emission reductions required by the SIP control strategy to attain the standards. See PM-10 Addendum at 42015; see also 72 FR 20586, 20643. The contingency measures are to be implemented if the area does not meet RFP or attain the standards by the attainment date, and "should represent a portion of the actual emission reductions necessary to bring about attainment in area" (72 FR 20586, 20643). Accordingly, EPA has recommended that the emission reductions anticipated by the contingency measures should be equal to approximately one year's worth of emission reductions needed to achieve RFP for the area.

Based on the Clean Air Section 172(c)(9) requirements and EPA's recommendation that contingency measures provide at least one year's worth of RFP-based emission reductions, potential measures were evaluated that could be implemented quickly and achieve PM-10 emission reductions equivalent to at least one year of linear RFP-based reductions. These measures are above and beyond the committed BACM/MSM measures described in Chapters 7 and 9. As described in the subsection on Reasonable Further Progress, one year of RFP translates to a PM-10 emission reduction of 795 tons/yr.

Committed Contingency Measure: Public Unpaved Roads Speed Limit Reduction

In conducting the BACM/MSM evaluation, San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 8061.5.2.5 was identified as a candidate BACM/MSM measure. SJVAPCD Rule 8061.5.2.5 (Requirements for Establishing and Posting Maximum Speed

Limits on Unpaved Roads) states: *"Each owner/operator shall establish a maximum speed limit of 25 mph on each unpaved road with 26 AADT or more and shall post speed limit signs, one in each direction, per mile of road segment in urban areas, and per two miles of road segment in rural areas. This provision shall become effective one year from the date of adoption of this rule amendment."*

The Pinal County Air Quality Control District has developed a contingency measure that will require owners/operators of unpaved public roads of 26 AADT or more to establish a maximum speed limit of 15 mph. This measure, if triggered, would lower the committed BACM/MSM speed limit from 25 mph to 15 mph. The resolution and commitment to implement this measure is included in Appendix D, Exhibit 1.

An evaluation of the PM-10 emissions reductions associated with implementing this contingency measure is performed in the Technical Support Document (Appendix B, Exhibit 1). That evaluation demonstrates that implementation of this measure in 2027 (first year after failing to attain) would result in emission reductions of 950.81 tons, which exceeds the EPA recommended one year's average increment RFP target of 795 tons.

MOTOR VEHICLE EMISSIONS BUDGET FOR CONFORMITY

In accordance with the 1990 Clean Air Act Amendments, conformity requirements are intended to ensure that transportation activities do not result in air quality degradation. Section 176 of the Amendments requires that transportation plans, programs, and projects conform to applicable air quality plans before the transportation action is approved by a metropolitan planning organization (MPO). The designated MPOs for the West Pinal County PM-10 nonattainment area include the Maricopa Association of Governments and the Sun Corridor Metropolitan Planning Organization.

Both the MAG Metropolitan Planning Area Boundary and the Sun Corridor Metropolitan Planning Area Boundary include portions of the West Pinal County PM-10 nonattainment area. The nonattainment area is covered by the boundaries of the two metropolitan planning organizations. Consequently, transportation conformity is required to be demonstrated for the nonattainment area by both metropolitan planning organizations.

Section 176(c) of the Clean Air Act Amendments provides the framework for ensuring that federal actions conform to air quality plans under section 110. Conformity to an implementation plan means that proposed activities must not (1) cause or contribute to any new violation of any standard in any area, (2) increase the frequency or severity of any existing violation of any standard in any area, or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

EPA transportation conformity regulations establish criteria involving comparison of projected transportation plan emissions with the motor vehicle emissions assumed in applicable air quality plans. The regulations (40 CFR Section 93.101) define the term "motor vehicle emissions budget" as meaning "that portion of the total allowable

emissions defined in the submitted or approved control strategy implementation plan revision or maintenance plan for a certain date for the purpose of meeting reasonable further progress milestones or demonstrating attainment or maintenance of the NAAQS, for any criteria pollutant or its precursors, allocated to highway and transit vehicle use and emissions."

On May 17, 2021, ADEQ withdrew all submitted portions of the ADEQ 2015 West Pinal Moderate PM-10 Nonattainment Area State Implementation Plan that EPA had not approved previously, including the motor vehicle emissions budgets. On July 23, 2021, EPA published a final rule "making a finding that Arizona has not submitted a required revision to the Arizona State Implementation Plan (SIP) for the West Pinal County nonattainment area addressing Clean Air Act (CAA) requirements for a Moderate area attainment plan, related rules, and other analyses needed to attain the 1987 24-hour particulate matter (PM10) National Ambient Air Quality Standard (NAAQS) by December 31, 2018." (86 FR 38928). For the West Pinal County PM-10 nonattainment area, conformity analyses will continue to apply the interim emissions tests until EPA has found adequate or approved the PM-10 motor vehicle emissions budgets.

The 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area establishes transportation conformity motor vehicle emissions budgets based on the committed measures implemented for the attainment year and reasonable further progress milestone years. The Plan includes motor vehicle emissions budgets for the reasonable further progress milestone year of 2023 and for the reasonable further progress milestone and attainment year of 2026.

The PM-10 emissions in the budgets include vehicle exhaust, tire wear and brake wear; road construction; re-entrained dust from vehicle travel on paved roads; and fugitive dust from vehicle travel on public and private (non-agricultural) unpaved roads. While unpaved private non-agricultural roads are not officially maintained by a city, county or town, they are generally accessible and used frequently by the public. As such, private non-agricultural roads have been included as an emission source category in the motor vehicle emissions budgets. Conversely, unpaved roads primarily used to access irrigation canals or farm fields have not been included as a category in the motor vehicle emissions budgets as these roads are generally not accessed or used by the public.

The PM-10 emissions with the committed measures that meet Best Available Control Measures and Most Stringent Measures requirements, demonstrate modeled attainment, and show reasonable further progress in 2023 and 2026 are summarized in Table 8-7 below in both pounds per day and kilograms per day. The emissions in Table 8-7 represent the mobile vehicle emissions budgets for 2023 and 2026.

Table 8-7
2023 and 2026 Motor Vehicle Emissions Budgets

Category	2023 PM-10 Emissions (lbs/day)	2023 PM-10 Emissions (kg/day)	2026 PM-10 Emissions (lbs/day)	2026 PM-10 Emissions (kg/day
Exhaust, tire/brake wear	774	462	727	330
Paved road dust	5,797	2,629	5,560	2,522
Road construction	1,019	462	819	371
Unpaved Public Roads	35,098	15,920	31,055	14,086
Unpaved Private Roads	56,552	25,652	55,467	25,160
Total	**99,240**	**45,014**	**93,628**	**42,469**

MAG will use these new budgets for conformity analyses that begin after the budget is found to be adequate or is approved by EPA as part of the 2022 Serious Area PM-10 Plan. In conformity analyses that begin after the new budgets are found to be adequate or approved, onroad mobile source PM-10 emissions for 2023-2025 within the nonattainment area cannot exceed the 2023 budget. For 2026, or horizon years after 2026, PM-10 emissions cannot exceed the 2026 budget.

The methods and assumptions used to estimate 2023 and 2026 onroad mobile source emissions for the source categories included in the motor vehicle emissions budgets are documented in Chapter III of the TSD (Appendix B, Exhibit 1). In future conformity analyses, the estimation of PM-10 emissions from these onroad mobile sources may differ from the TSD estimates, because EPA requires use of the latest planning assumptions (e.g., new emissions models, vehicle registration data, vehicle speeds, and population and travel projections) in effect at the time each conformity analysis begins.

9. REQUEST FOR EXTENSION OF THE ATTAINMENT DATE

The PM-10 National Ambient Air Quality Standards (NAAQS) attainment date for the West Pinal County Serious PM-10 nonattainment area is December 31, 2022. As shown in Chapter 3, attainment of the PM-10 NAAQS in the West Pinal County nonattainment area by December 31, 2022 is impracticable. The purpose of this chapter is to submit a request to EPA for an extension of the attainment date as allowed under Section 188(e) of the Clean Air Act (CAA). An extension of the attainment date until December 31, 2026 is requested, the most expeditious attainment date possible as demonstrated in the attainment modeling provided in Chapter 8.

Clean Air Act Section 188(e) allows the attainment date for a Serious PM-10 nonattainment area to be extended for up to five years. Extensions can be granted by the EPA Administrator upon application by any state provided that several requirements are satisfied. Although the CAA is specific in listing the factors that the Administrator has either an obligatory or discretionary responsibility to evaluate in reaching a decision on an extension request, EPA has issued no specific guidance to assist applicants in assembling requests that are complete and responsive to CAA requirements. Reasoned interpretations of the Section 188(e) requirements were used to guide the analyses and data included in this extension request.

Presented below is a summary of each of the extension request requirements and the analyses and data used to meet those requirements:

1. An extension of the attainment deadline cannot be granted unless the EPA Administrator determines that attainment by December 31, 2022, would be impracticable. Multiple exceedances of the PM-10 NAAQS at the Hidden Valley monitor in 2020 make attaining the form of the PM-10 standard by December 31, 2022 impossible and therefore, impracticable.

2. The extension request must demonstrate that the state has complied with all requirements and commitments contained in the implementation plan for that area. While the ADEQ 2015 West Pinal Moderate PM-10 Nonattainment Area SIP has been withdrawn, the control measures included in the plan remain in place and are locally enforced by the Pinal County Air Quality Control District and the Arizona Department of Environmental Quality. This 2022 Serious Area PM-10 Plan includes formal resolutions committing to implement the control measures included in the Plan.

3. The extension request must also demonstrate that the SIP for that area includes the most stringent measures that are included in the implementation plan of any state or are achieved in practice in any state, and can feasibly be implemented in the area. A demonstration included in this Chapter illustrates that the most stringent provisions/measures were identified and selected for consideration as committed measures by implementing entities.

4. Each request for extension must be accompanied by a revision to the SIP that includes a demonstration of attainment by the most expeditious alternative date practicable. Attainment modeling as described in Chapter 8 shows that implementation of all feasible Best Available Control Measures (BACM) and most stringent measures (MSM) will result in attainment of PM-10 standards by December 31, 2026 and this represents the most expeditious attainment date practicable.

5. In determining whether to grant an extension, the Administrator may consider several additional factors, including: the nature and extent of nonattainment; the types and number of sources in the area; the population exposed to concentrations in excess of the standard; the presence of toxic substances in particulate emissions in the area; and the technological and economic feasibility of various control measures. Analyses of these other factors show that granting an extension of the attainment date will only affect a small portion of the nonattainment area and its population and will not increase the risk of toxic exposure. Reasoned justification for not implementing some of the Most Stringent Measures has been provided by the implementing entities.

DEMONSTRATION OF THE IMPRACTICABILITY OF ATTAINMENT BY DECEMBER 31, 2022

Under CAA Section 188(e), a request to extend the attainment date beyond December 31, 2022, must be accompanied by a demonstration that attainment by this date in impracticable. As discussed in Chapter 3, in order to attain the PM-10 standard by December 31, 2022, the form of the PM-10 standard requires that the West Pinal County nonattainment area cannot have more than three non-exceptional event exceedances at each monitoring site within the three-year period of 2020-2022. As shown in Table 3-10, PM-10 monitoring data at the Hidden Valley monitor indicates there are 56 non-exceptional event exceedances in 2020. This exceeds the three allowable for the period of 2020-2022. Therefore, the 2020 PM-10 monitoring data in the West Pinal County nonattainment area indicates that attainment of the PM-10 standard by December 31, 2022 is impracticable.

Additionally, initial evaluation of preliminary 2021 PM-10 monitoring data at the Hidden Valley monitor indicates there are 21 non-exceptional event exceedances of the PM-10 NAAQS. This indicates that attainment of the PM-10 standard by December 31, 2023 is also impracticable, and that the earliest practicable attainment date would be December 31, 2024. The PM-10 monitoring data within the West Pinal County nonattainment area clearly demonstrates that attainment by December 31, 2022 is impracticable and an extension of the attainment date is required.

COMPLIANCE WITH ALL REQUIREMENTS AND COMMITMENTS OF THE IMPLEMENTATION PLAN

Section 188(e) of the Clean Air Act requires that a request for an extension of the

attainment date include a demonstration that the state has complied with all requirements and commitments pertaining to that nonattainment area in the state implementation plan (SIP). In response to EPA's initial designation of the West Pinal County nonattainment area as a Moderate Area, effective July 2, 2012, the Arizona Department of Environmental Quality (ADEQ) prepared the 2015 West Pinal Moderate PM-10 Nonattainment Area State Implementation Plan and submitted it to EPA on December 21, 2015. The ADEQ 2015 West Pinal Moderate Plan identified significant sources of PM-10 within the nonattainment area and included control measures designed to meet Moderate Area requirements such as Reasonably Available Control Measures (RACM) and designed to demonstrate attainment of the PM-10 standard by the Moderate Area attainment date of December 31, 2018. A summary of the control measures for significant sources of PM-10 included in the ADEQ 2015 West Pinal Moderate Plan can be found in Chapter 4 in the overview of existing control measures.

After submittal of the ADEQ 2015 West Pinal Moderate Plan to EPA on December 21, 2015, EPA published a final rule on May 1, 2017 approving some of the rules and statutes contained in the ADEQ 2015 West Pinal Moderate Plan concerning the regulation of PM-10 emissions from construction sites, some agricultural activities, and other fugitive dust sources in the West Pinal County nonattainment area.

On January 8, 2021, EPA proposed a partial approval and partial disapproval of the ADEQ 2015 West Pinal Moderate Plan. EPA proposed to approve the base year 2008 emissions inventory for direct PM-10 emissions and proposed to disapprove the remaining elements of the plan including the attainment demonstration, reasonable further progress, reasonably available control measures (not previously acted upon), contingency measures, and motor vehicle emission budgets.

As a result of EPA's proposed partial approval and disapproval of the ADEQ 2015 West Pinal Moderate Plan, ADEQ withdrew the 2015 West Pinal Moderate Plan and related unapproved rules from consideration for further action by EPA on May 17, 2021. Although the Plan was withdrawn, the control measures in the Plan (both those approved by EPA and those not acted upon) continue to be implemented and enforced at the local level to reduce PM-10. These existing control measures, as described in Chapter 4, are in place and enforced by the Arizona Department of Environmental Quality and the Pinal County Air Quality Control District as applicable.

Additionally, this 2022 Serious Area PM-10 Plan includes formal resolutions committing to implement the control measures included in the Plan. As of Plan submittal, some of the committed control measures pertaining to agricultural sources have already been adopted as state regulations and are being enforced by the Arizona Department of Environmental Quality (Appendix D, Exhibit 2). The other committed control measures in the 2022 Serious Area PM-10 Plan are backed by resolutions that ensure they will be implemented according to the schedules outlined in the commitments. In summary, the information presented above demonstrates that the state is currently complying with all requirements and commitments included in the relevant revisions to the State Implementation Plan for

the West Pinal County nonattainment area.

DEMONSTRATION OF INCLUSION OF THE MOST STRIGENT MEASURE FOUND IN ANY STATE IMPLEMENTATION PLAN THAT CAN BE FEASIBLY IMPLEMENTED

Section 188(e) of the Clean Air Act requires "the state demonstrates to the satisfaction of the Administrator that the plan for that area includes the most stringent measures that are included in the implementation plan of any State or are achieved in practice in any State and can feasibly be implemented in the area."

With awareness of the impractibility of attainment of the PM-10 NAAQS by December 31, 2022 (and the need for an extension request and a Most Stringent Measures demonstration) early in the Serious SIP development process, the Best Available Control Measure (BACM) and Most Stringent Measure (MSM) evaluations were conducted under a combined approach, knowing that both would be required.

This section of Chapter 9 documents the approach and processes employed to demonstrate inclusion of MSMs within the control measure being adopted in conjunction with this 2022 Serious Area Particulate Plan for PM-10. The approach divided into three phases as follows:

1. Identify and perform stringency evaluations of candidate measures,
2. Assess the feasibility of implementation, and
3. Develop a plan which includes commitments to implement those measures determined to be feasible.

Presented below are discussions of each of these phases.

Phase 1 – Identify and Perform Stringency Evaluations of Candidate Measures

As described in detail in Chapters 4 and 5, an independent consultant was commissioned to review, identify and evaluate controls from all applicable Serious PM-10 nonattainment or maintenance areas. Knowing that this 2022 Serious Area Particulate Plan for PM-10 would need to include a demonstration of BACM as well as the inclusion of MSM, this work was essentially conducted in a manner to satisfy both requirements.

As explained in detail in Chapter 4 under the "Stringency Evaluations" section, 115 control measure/provisions were reviewed, spanning West Pinal County and the ten applicable PM-10 planning areas. These 115 candidate measures were organized in a manner in which their stringency was compared to similar measures in West Pinal County, or to identify measures that have not been adopted and implemented in West Pinal County. These stringency comparisons were performed not by looking at measures as a whole, but rather by individual measure provision. These measure provisions included, but were not limited to the following:

- Definition/Applicability
- Standards and Requirements
- Control Implementation Conditions
- Control Options
- Training, Reporting, and Recordkeeping

As further explained in Section 4, de-constructing existing measures into component elements enabled provisions from other planning areas to be compared and selected individually within the stringency evaluations to support determination and inclusion of MSM.

Stated simply, the stringency evaluations and ensuing recommendation of suggested measure was performed where the most stringent provision of any adopted control measure was compared both to that in West Pinal County as well as across each of the ten other applicable PM-10 planning areas. In this manner, measures from the consultant stringency comparisons (Appendix C, Exhibit 2) and measure evaluation report (Appendix C, Exhibit 3) were identified and selected to meet both BACM and MSM stringency requirements.

At first look, the stringency evaluation procedures used to identify candidate measures for adoption in the 2022 Serious Area PM-10 Plan make it difficult to parse the difference between BACM and MSM. However, upon further examination and evaluation, this procedure was determined to be the most conservative approach possible – i.e., by identifying and **always selecting** the most stringent measure/provision for inclusion as a suggested measure ensures that the most stringent measures would be included as part of the 2022 Serious Area PM-10 Plan. Under a strict BACM-only approach the most stringent measure/provision would likely be identified but not always selected for inclusion as a candidate BACM based upon the evaluation of other BACM factors.

To be conservative and thorough, the approach in this plan starts with the premise of identifying MSM, with the understanding that MSM would naturally also qualify as BACM. As explained in Chapters 4 and 5, the stringency comparison was prepared for all significant sources of PM-10 emissions. The attainment modeling included in this 2022 Serious Area PM-10 Plan also concluded that no additional significant sources of PM-10 emissions were identified than those described in Chapter 4. Therefore, based on the "provision-level" approach used to perform the stringency comparisons, which resulted in always selecting the most stringent measure available out of ten areas with similar fugitive dust PM-10 pollution problems, the 70 measures included in the Suggested List of Measures qualify as MSM.

<u>Phase 2 – Assess the Feasibility of Implementation</u>

As explained in Chapters 6 and 7, a total of 70 suggested measures from these combined BACM/MSM evaluations were approved by the MAG Regional Council and circulated for evaluation of implementation feasibility by the implementing entities. Implementing

entities then reviewed the measures from the Suggested List of Measures to Reduce PM-10 Particulate Matter which were under their respective authorities. Each entity then determined which measures were technologically and economically feasible for implementation by that entity.

Out of the total of 70 suggested measures, nine were found to be infeasible for implementation. Many of the measures that were not committed were determined to provide either no additional quantifiable emission reductions or were found to be duplicative. Since these nine MSM provide none or very limited quantifiable PM-10 emission reductions, implementation of these measures would not hasten attainment beyond the requested extension date of December 31, 2026. Reasoned justifications for not committing to the nine measures are included in Chapter 7 and repeated here for completeness.

Pinal County Air Quality Control District (PCAQCD)

Suggested Measure 11 (Construction Sites, Adopt Sand Blasting & Abrasive Blasting Dust BMPs)

PCAQCD has not observed large scale sand blasting or abrasive blasting at construction sites. Rather, it has been observed that those activities are more prevalent at facilities such as auto body shops and fabrication shops which are permitted by PCAQCD's minor source permitting program if their PTE exceeds 1 ton per year of PM-10 emissions. Residential and commercial construction in the West Pinal PM-10 Nonattainment Area are predominantly new construction, therefore, construction related sand blasting and abrasive blasting in the West Pinal PM-10 NAA was determined to be De Minimis. Additionally, PCAQCD determined the measure is not economically feasible considering the cost per ton of PM I 0 reduction is $17,713,432 and would result in 0.00011 tons of PM-10 emission reduction across the nonattainment area.

Suggested Measure 15 (Construction Sites, Adopt Crushing Operation Dust Control BMP)

The majority of residential construction that takes place in the West Pinal PM to NAA is new construction and is located primarily on former farmlands or vacant lands. These areas do not include existing foundations to be removed. Required base materials are imported from other locations. Large scale construction projects such as commercial and highway construction may utilize onsite processing of base materials and concrete. In those situations, the crushing and screening equipment would be required to obtain an operating permit from the Arizona Department of Environmental Quality for portable sources or PCAQCD for stationary sources. In both cases the equipment would be subject to applicable stack and drop point emission controls and surface stabilization of work areas would be subject to PCAQCD fugitive dust controls identified in the fugitive dust construction rules, specifically measures committed to in Pinal County Measure 1. PCAQCD has determined that this measure is duplicative, unnecessary, and

economically infeasible.

Measure 17 (Construction Sites, Adopt Screening Operation Dust Control BMP)

Same justification as for Measure 15.

Suggested Measure 29 (Cleared Areas, Require Mitigation Plans for Open Areas/Vacant Lots Over 10,000 Acres in Size)

There are currently no open areas/vacant lots (i.e., cleared areas) within the West Pinal Serious PM-10 nonattainment area that exceed the 10,000-acre applicability threshold. This is supported by the Trinity analysis. Therefore, it is economically and technically infeasible to commit to a mitigation plan requirement for something which doesn't apply to the West Pinal nonattainment area.

Suggested Measure 57 (Unpaved Roads, Explicit Dust Mitigation Controls for Off-Road Event Competitions on Unpaved Roads)

Measure 57 (Imperial County Rules 800.F.5) applies to established recreational off road use areas on public lands and imposes a dust control plan and related control measures. Imperial's rule appears to address a peculiar local condition. There are no off-road recreational use areas currently identified on public lands in the West Pinal Serious PM-10 nonattainment area. Therefore, PCAQCD has concluded that implementing this measure would not provide quantifiable emission reductions in the area and is unnecessary for compliance.

Suggested Measure 60 (Unpaved Lots, Prohibit Unpaved Lot/Storage Areas on Hydrographic Lands)

PCAQCD has committed to Measures 58 and 59 which implement control requirements for vacant lots. Based upon this information PCAQCD concluded that the measure is duplicative, unnecessary, and as such economically infeasible.

Suggested Measure 68 (Paved Roads, Require Use of Wetted Brushes and Blowers on Sweepers Used on Both Paved Roads and Parking Lots and Only Vacuum-Type Cleaning Equipment in Pavement Crack Sealing Applications)

The Trinity BACM/MSM analysis referenced the " ... existing fugitive dust opacity limits in West Pinal were determined to pre-empt the equipment requirements of this measure; therefore, it has no benefit." Based upon this information PCAQCD concluded that the measure is duplicative, unnecessary, and as such economically infeasible.

<u>Agricultural Best Management Practices Committee</u>

Measure 48 (Agriculture, Stabilization Requirements for Off-Field Bulk Material Storage)

This measure reflecting controls for bulk materials has not been adopted by the AgBMP Committee for implementation, because crop producers in Pinal County do not haul, transport, or store bulk materials. They only haul or store course fibrous products such as cotton seed, lint, hay fiber, large feed fiber chopped from plant materials, or grain products. This measure would therefore not contribute to expeditious attainment of the PM10 NAAQS and under EPA guidance need not be implemented in the West Pinal Serious PM10 Nonattainment Area.

Suggested Measure 49 (Agriculture, Fugitive Dust Controls for Off-Field Bulk Material Handling and Transport)

Same justification as for Measure 48.

Phase 3 – Develop an Implementation Plan for Committed Feasible Measures

The implementing agencies (the Governor's Agricultural Best Management Practices Committee and the Pinal County Air Quality Control District) developed formal commitments and implementation plans for these technically and economically feasible 61 committed measures. Table 9-1 (reprinted from Table 7-1 for readability), summarizes measure commitments from each implementing agency organized by source category and suggested measure number.

Table 9-1
Committed Measures for the 2022 Serious Area Particulate Plan for PM-10

Suggested Measure #	Emission Source Category	Implementing Entity Committed Measure
1-10, 12-14, 16, 18-25	Construction Sites	Pinal County Measure 1 – Construction Fugitive Dust Sources
26-28, 30	Cleared Areas	Pinal County Measure 2 – Open Areas/Vacant Lot Fugitive Dust Sources
31-37	Dairies	Governor's Agricultural BMP Committee – Dairy Measures 31-37
38-44	Cattle CAFOs	Governor's Agricultural BMP Committee – Cattle CAFO Measures 38-44
45-47, 50-51	Agricultural (Cropland)	Governor's Agricultural BMP Committee – Agricultural Cropland Measures 45-47, 50-51
52-56	Unpaved Roads	Pinal County Measure 3 – Unpaved Roads
58-59	Unpaved Lots	Pinal County Measure 4 – Unpaved Lots
61-67, 69-70	Paved Roads	Pinal County Measure 5 – Paved Roads

As explained in detail in Chapter 7, implementation plans (including implementation schedule, compliance monitoring, and enforcement) were prepared and provided for each individual committed measure. For the agricultural measures, rulemaking work has already been completed and has been included as in the 2022 Serious Area PM-10 Plan for adoption in the SIP (Appendix D, Exhibit 2). All measures have commitments to be fully implemented by the July 24, 2024 BACM implementation deadline. And as explained in detail in Chapter 7, the implementation plans for these committed measures will include on-going compliance and enforcement mechanisms for maximizing timely and effective implementation over time toward assurance of attainment by the projected December 31, 2026 attainment date.

In summary, the process and approaches described under each of the three phases discussed above demonstrate evaluation and inclusion of Most Stringent Measures within the Adopted 2022 Serious Area Particulate Plan for PM-10.

OTHER EXTENSION REQUEST FACTORS

Section 188(e) of the Clean Air Act also lists a series of additional factors that the

Administrator may consider in determining whether to grant an extension. Presented below is a discussion of each of the listed factors for the West Pinal County PM-10 nonattainment area.

Nature and Extent of PM-10 Nonattainment

Chapter 3 of this plan contains a discussion of the PM-10 monitoring data and PM-10 emissions inventory for the West Pinal County PM-10 nonattainment area. A summary of that discussion is provided here.

The formation of PM-10 particulate pollution in the West Pinal County nonattainment area is dependent upon several factors. Among these factors are meteorological factors such as stagnant air masses, temperature inversions, and high winds from thunderstorms and frontal systems. The fine, dry and silty soils characteristic of desert locations, including the West Pinal County nonattainment area, promote the direct entrainment and suspension of PM-10, especially from recently disturbed surfaces. In the nonattainment area, high PM-10 concentrations occur throughout the year and generally occur on days with dry, stagnant conditions, and on days with high winds from thunderstorm outflows or passing frontal systems.

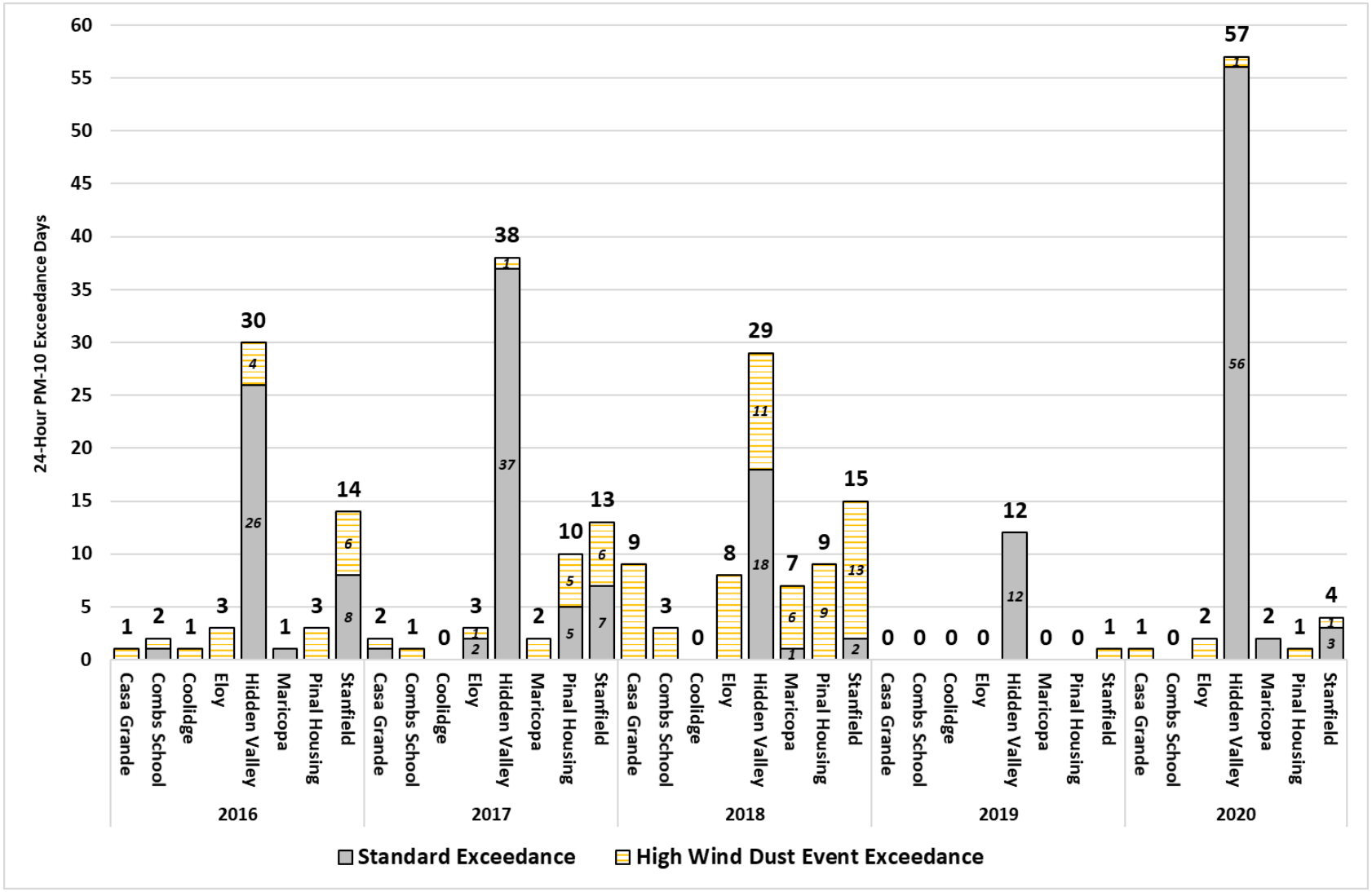
The PM-10 pollution in the arid Southwest, including the West Pinal County nonattainment area, largely consists of coarse particles (i.e., aerodynamic diameter greater than 2.5 microns but less than or equal to 10 microns) which are typically crustal in nature and derive mainly from windblown dust, reentrained road dust (from paved, unpaved roads and parking lots), construction, and agricultural activities (e.g., tilling and harvesting, animal operations, and travel on unpaved farm roads). Other secondary components of particulate matter, such as ammonia, sulfates, nitrates, volatile organic compounds, and elemental/organic carbon are typically found in the fine fraction of particulate matter (i.e., aerodynamic diameter less than or equal to 2.5 microns), and are most often the product of combustion activities (e.g., vehicle exhaust and fires). These secondary precursors to PM-10 formation have been found to be insignificant contributors to exceedances of the PM-10 standard in the West Pinal County nonattainment area. Within the West Pinal County nonattainment area, it is the direct, primary emission of PM-10 that leads to exceedances.

The 2017 baseline PM-10 emissions inventory for the West Pinal County nonattainment area indicates that on an annual basis unpaved roads account for approximately 75% of annual PM-10 emissions. Windblown dust from a variety of land uses account for approximately 9% of annual PM-10 emissions, followed by agricultural tilling and harvesting at 5%, feedlots and dairies at 4%, construction at 3%, and fugitive dust from paved roads at 2%. A variety of other combustion and fugitive dust sources individually contribute less than 2% of annual PM-10 emissions. Collectively these source categories are estimated to have contributed annual PM-10 emissions of 41,168 tons and daily average PM-10 emissions of 242,332 pounds in calendar year 2017 within the West Pinal County nonattainment area.

With regard to PM-10 monitoring data throughout the nonattainment area, the number of 24-hour PM-10 exceedance days by air quality monitoring station in 2016-2020 is shown in Figure 9-1 (same as Figure 3-4). For each monitoring station, the number of 24-hour PM-10 exceedance days in each year is divided into two categories of exceedances: Standard exceedances and High Wind Dust Event (HWDE) exceedances. For purposes of classification, standard exceedances are exceedances that do not qualify as a High Wind Dust Event. A HWDE exceedance is an exceedance that occurs when sustained wind speeds at the exceeding monitor, or in the source region of the exceedance event, are at or above 25 miles per hour. In general, exceedances caused by HWDE are considered uncontrollable, and the HWDE exceedances are candidates for exclusion from use in comparison to the PM-10 standard under the EPA Exceptional Events rule. To date, none of the HWDE in Figure 9-1 have been officially concurred upon by EPA as exceptional events and all 2016-2020 exceedances are currently eligible for comparison against the PM-10 standard.

The data in Figure 9-1 indicate that the spatial distribution of PM-10 exceedance days is not uniform across the nonattainment area. This is not unexpected. As discussed in Chapter 3, the PM-10 pollution problem in the West Pinal County nonattainment area is caused by the coarse fraction of PM-10. The coarse fraction of PM-10 tends to fall out quickly from the air after suspension and does not readily transport across the nonattainment area. As such, standard exceedances are local in nature, and the PM-10 emission sources nearest the monitoring station (generally within 2 miles) are the greatest contributor to PM-10 exceedances. The exception to this general rule is during HWDE, when extreme wind speeds can keep coarse fraction PM-10 suspended longer and one HWDE has the potential to cause exceedances at multiple monitoring stations.

Figure 9-1
2016-2020 24-Hour PM-10 Exceedance Days by Monitor in the West Pinal County Nonattainment Area



Section 188(e) also requires that air quality impacts due to the influence of uncontrollable natural sources and transboundary emissions from foreign countries be assessed. As touched on above, except during high wind dust events, very little evidence exists to suggest that transport of PM-10 concentrations from outside of the nonattainment area contribute significantly to PM-10 exceedances within the nonattainment area. Since the PM-10 pollution problem in the West Pinal County nonattainment area is due to fugitive dust sources, which generate coarse fraction PM-10, local sources are identified as the primary contributor to PM-10 exceedances. The PM-10 emissions and monitoring data indicate that during low wind conditions it is the sources located within two miles of the PM-10 monitoring site that cause the PM-10 exceedances. This is borne out in the spatial variability of exceedances as seen in Figure 9-1. Additionally, during elevated wind conditions that do not rise to the level of high wind dust events, the majority of the PM-10 concentrations that lead to exceedances are caused by PM-10 emissions from disturbed lands located nearest to the monitor. Since it is still the coarse fraction of PM-10 that is being generated during elevated wind events, attainment modeling has concluded that it is generally the sources located within four miles of the PM-10 monitoring site that have the greatest impact on PM-10 concentrations during elevated wind events.

During high wind dust events, PM-10 concentrations can both be generated within the nonattainment area and transported in from areas outside of the nonattainment area, including transport from other states and Mexico. High wind dust event exceedances are considered to be uncontrollable, as wind speeds are high enough to generate PM-10 emissions from natural sources (e.g., undisturbed desert areas). As these events are uncontrollable, granting a request for an extension of the attainment date will have no bearing on the frequency of occurrence of these events.

In summary, the PM-10 emissions inventory and monitoring data indicate that the nature and extent of PM-10 pollution is highly variable across the nonattainment area. Except during some high wind dust events, PM-10 exceedances are heavily influenced by the mix of sources located near the monitoring station. The committed controls included in this plan are targeted at reducing the PM-10 emissions from the fugitive dust sources responsible for non-high wind dust event exceedances. While PM-10 exceedances are variable across the nonattainment area, the committed controls included in this plan will apply throughout the nonattainment area and will reduce PM-10 emissions across the nonattainment area. Granting an extension of the attainment date will not increase the nature or extent of the PM-10 pollution problem in the nonattainment area, but will rather allow time for the necessary committed Best Available and Most Stringent control measures to be implemented, leading to attainment of the PM-10 NAAQS.

Population Exposures

As discussed above, PM-10 exceedances within the nonattainment are highly linked to specific meteorological conditions. Primarily, exceedances occur when there are (1) low wind, stagnant and dry conditions, or (2) when winds are elevated above the threshold for the production of PM-10 emissions from windblown dust.

A subset of PM-10 exceedances caused by elevated winds are high wind dust events (generally defined as an event with sustained wind speeds above 25 mph). Uncontrollable high wind dust events are highly dependent upon the strength of passing frontal systems and summer monsoon season conditions. PM-10 exceedances from high wind dust events are expected to reoccur even after the full implementation of all the committed controls included in this plan. The populations exposed to PM-10 exceedances caused by high wind dust events is driven by the particular location and severity of frontal systems and thunderstorm outflows. These events are highly variable and can be a localized event limited to just a few miles, or can be a regional event that can elevate PM-10 concentrations across the state. For these types of events, an extension of the attainment date will not increase or decrease the population exposure to PM-10 exceedances caused by uncontrollable high wind dust events.

PM-10 exceedances under low wind conditions, or elevated winds that do not meet the high wind dust event threshold, are considered controllable. The committed controls in this plan are designed to bring the West Pinal County nonattainment area into attainment by limiting these controllable exceedances. The data in Figure 9-1 indicate that controllable exceedances (designated as standard exceedances in Figure 9-1) are not uniform across the nonattainment and vary based upon monitoring location. This is due to the fact that PM-10 concentrations within the nonattainment area generally do not transport beyond a few miles from their source. It is the particular and unique mix of sources located near the monitoring site (generally limited to a maximum of four miles) that contribute to the PM-10 exceedance.

Of the eight monitoring sites included in Figure 9-1, only three of the eight sites violate the PM-10 standard based upon 2016-2018 monitoring data when high wind dust events are removed: Hidden Valley, Pinal County Housing, and Stanfield. When considering 2018-2020 only two monitors violate the PM-10 standard when high wind dust events are removed: Hidden Valley and Stanfield. In general, it is the populations that live in areas with land use mixes similar to areas surrounding the Hidden Valley and Stanfield monitors that are subject to PM-10 exposures above the NAAQS.

The PM-10 monitoring sites that best represent where the majority of the nonattainment area population lives and works (highest population and employment densities) include Casa Grande, Combs School, Eloy, and Maricopa. These sites are located within urban and suburban locations, capturing the PM-10 emissions and concentrations that are typically generated where people live and work. These monitoring sites are all currently attaining the PM-10 NAAQS based upon 2016-2018 and 2018-2020 monitoring data when high wind dust events are removed. PM-10 concentrations are generally lower at these types of monitoring sites because there are significantly fewer fugitive dust sources (e.g., unpaved roads, agricultural fields, etc.) available to generate PM-10 emissions as compared to rural sites. Since the monitoring stations that best represent where the majority of the nonattainment area population lives and works are currently attaining the PM-10 NAAQS, an extension of the attainment date will likely not increase or decrease

the population exposure to PM-10 exceedances for the majority of the population within the nonattainment area.

For the Hidden Valley and Stanfield monitors where the PM-10 NAAQS is being violated based upon 2016-2018 and 2018-2020 data, the population and employment density of these areas is small compared to the four monitoring locations discussed in the previous paragraph. The Maricopa Association of Governments (MAG) Regional Analytics division has prepared 2017 population and employment data for the nonattainment area and the modeling domains around the Hidden Valley and Stanfield monitors. As discussed in Chapter 8, the modeling domains are a 4-mile radius circle around each of the two monitoring sites and capture the emission sources that cause the exceedances at the Hidden Valley and Stanfield monitors.

The West Pinal County nonattainment area covers an area of approximately 1,326 square miles. Each of the modeling domains around the Hidden Valley and the Stanfield monitors are approximately 50.27 square miles, which is equivalent to 3.8% of the total nonattainment area. The Hidden Valley and Stanfield monitoring domains are dominated by agricultural land uses and natural desert areas.

The 2017 population of the nonattainment area is estimated to be 343,788. The 2017 population of the Hidden Valley and Stanfield modeling domains are estimated to be 2,532 and 1,256, respectively (0.7% and 0.4% of total nonattainment area population). Total 2017 employment within the nonattainment area is estimated to be 55,217, with Hidden Valley employment estimated to be 239 and Stanfield employment at 491 (0.4% and 0.9% of total nonattainment area employment). Within the modeling domains, both the population and employment percentages are significantly lower the area percentages, indicating the low density of population and employment exposed to PM-10 exceedances.

In summary, the data above indicate that only a very small percentage of the population of the nonattainment area is likely exposed to PM-10 concentrations above the PM-10 NAAQS, when uncontrollable high wind dust events are not considered. Therefore, an extension of the attainment date will likely not increase or decrease the population exposure to PM-10 exceedances for the vast majority of the population within the nonattainment area.

Presence of Toxic Substances in Particulate Emissions

The presence and mix of toxic substances in PM-10 concentrations has historically been difficult to measure and quantify. Most epidemiological studies of PM-10 and PM-2.5 rely on overall mass concentrations of PM-10 and PM-2.5 as the cause of negative health impacts. Both PM-10 and PM-2.5 can contain complex mixtures of inorganic and organic compounds. This makes it difficult to distinguish which specific particulate substances are the most toxic.

In general, most particulate research has concluded that the smaller the mass of the

particle is, the more likely it is that the particle is toxic. EPA states that:

> *"Particulate matter contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems…Of these, particles less than 2.5 micormeters in diameter, also known as fine particules or $PM_{2.5}$, pose the greatest risk to health."* (Particulate Matter (PM) Basics: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics)

As discussed above, since the vast majority of the PM-10 within the West Pinal County nonattainment area is coarse PM-10 (particles larger than PM-2.5), it is likely that the toxicity of PM-10 concentrations within the nonattainment area is less as compared to other areas where fine portion of PM-10 is in greater proportion.

A chemical composition study of particulate matter performed in the West Pinal County nonattainment area in 2009 and 2010 found the following:

> *"Coarse particle concentrations are, on average, approximately 5 times fine particle mass concentrations within the region…Crustal material is the dominant component of coarse particle composition, representing 50% of the mass on average followed closely by organic matter representing 15%. Fine particles still contain a significant crustal fraction (30%) but organic matter dominates at 37% of the particle mass."* (Clements et al, 2014. Chemical characterization of coarse particulate matter in the Desert Southwest – Pinal County Arizona, USA.)

The chemical composition study matches PM-10 emissions inventory and air monitoring data that point to fugitive dust sources as the primary contributor to PM-10 concentrations and exceedances within the nonattainment area. These findings confirm that the risk of toxic substances within particulate matter is likely less in the West Pinal County nonattainment area than in other areas where fugitive dust sources are a smaller portion of PM-10 emissions. Therefore, an extension of the attainment date will likely not significantly increase exposure to toxic substances of PM-10 within the nonattainment area.

Technological and Economic Feasibility of Control Measures

Analyses of the technological and economic feasibility of Best Available Control Measures (BACM) and Most Stringent Measures (MSM) have been provided in Chapters 4-5 as part of the process to identify, select and implement committed control measures for this plan. Reasoned justification for non-implementation of BACM and/or MSM have been provided by the implementing entities as part of their commitments.

Overall, the implementing entities committed to implementing 61 of the 70 suggested BACM and MSM measures. Many of the measures that were not committed were determined to provide either no additional quantifiable emission reductions or were found to be duplicative. Implementation of the 61 committed measures is critical for

demonstrating attainment of the PM-10 NAAQS within the nonattainment area, and illustrates the magnitude of the PM-10 pollution problem and the need for an extension of the attainment date.

10. PUBLIC PARTICIPATION

The Transportation-Air Quality Guidelines for public participation are issued jointly by the U.S. Environmental Protection Agency and the U.S. Department of Transportation. These guidelines are designed to encourage an effective public participation program for the development and implementation of the State Implementation Plan (SIP). According to the guidelines, the objectives of the public participation program should be to:

1. Promote public awareness of the air pollution problem, the SIP revision process, and the effects of various transportation control measures;

2. Encourage active participation from a variety of interest groups in the plan preparation process;

3. Promote public understanding and agreement on the transportation control measures necessary to improve air quality;

4. Provide for the identification of both interested and affected constituencies;

5. Ensure that the agencies and elected officials are responsive to these constituencies; and

6. Encourage a spirit of openness and trust among elected officials, agencies, and the public.

In order to be responsive to these guidelines, the Maricopa Association of Governments has established a formal public participation program. The program includes the MAG Air Quality Technical Advisory Committee, additional Air Quality Working Groups, as necessary, the MAG Management Committee, and the MAG Regional Council.

DECISION MAKING STRUCTURE

The Maricopa Association of Governments has been designated as the lead planning agency for air quality planning within the Maricopa and Pinal County areas. MAG member agencies include twenty-seven cities and towns within Maricopa County and portions of Pinal County, Maricopa County, Pinal County, the Gila River Indian Community, the Salt River Pima-Maricopa Indian Community, Fort McDowell Yavapai Nation, and the Arizona Department of Transportation. A representative from the Regional Public Transportation Authority is also included on the MAG Management Committee. Two Maricopa County State Transportation Board members representing the Arizona Department of Transportation are also on the Regional Council. The policy development process is influenced by input from the MAG member agencies, MAG committees, local citizens, and staff.

The decision-making body for MAG is the Regional Council, which is composed of elected officials from the member agencies. The MAG Management Committee, which is

composed of managers from the member agencies, makes recommendations to the Regional Council (see Figure 10-1).

The MAG Air Quality Technical Advisory Committee was established by the MAG Regional Council in 1995. The purpose of the Committee is to review and comment on technical information generated during the planning process and make technical recommendations to the MAG Management Committee.

PUBLIC PARTICIPATION IN THE PREPARATION OF THE 2022 SERIOUS AREA PARTICULATE PLAN FOR PM-10 FOR THE WEST PINAL COUNTY NONATTAINMENT AREA

The process used to develop the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area included numerous meetings of the MAG Air Quality Technical Advisory Committee, MAG Management Committee and MAG Regional Council. All of these meetings were open to public attendance. During the preparation of the 2022 Serious Area Plan for PM-10, a public hearing was conducted to solicit additional citizen input. A brief description of the Air Quality Technical Advisory Committee meetings conducted in preparing the plan is provided below.

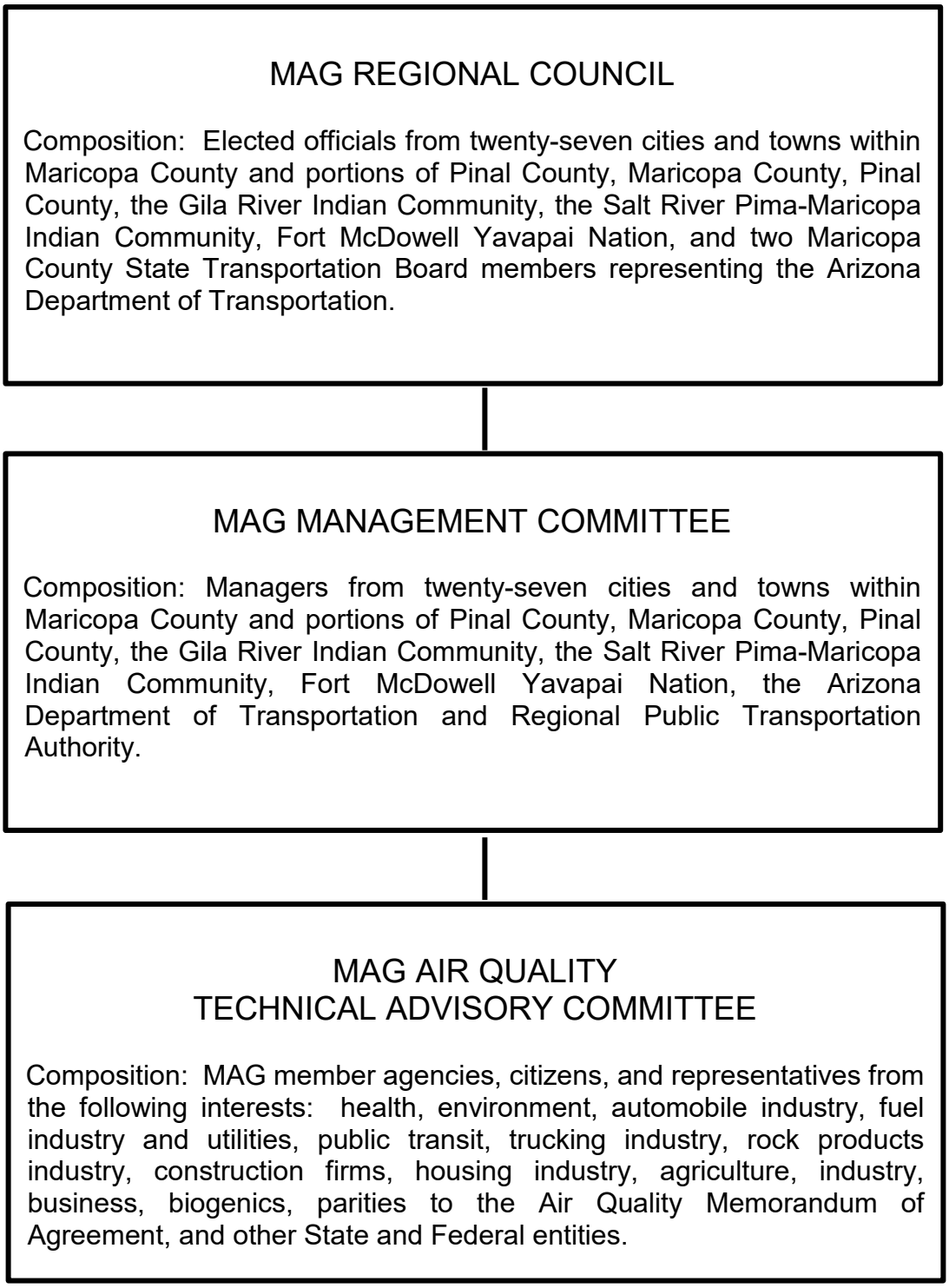
Meetings of the MAG Air Quality Technical Advisory Committee

On May 21, 2020, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Draft MAG 2020 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area; CMAQ Annual Report; How COVID-19 is Affecting Traffic and Emissions; and EPA Proposed Finding of Failure to Attain the PM-10 Standard in the West Pinal County Nonattainment Area.

On August 27, 2020, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the EPA Final Rule on Finding of Failure to Attain the PM-10 Standard in the West Pinal County Nonattainment Area; Tentative Schedule for the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area; Valley Metro Update on the New Share The Ride System and Solar Canopies; and EPA Final Action on the MAG 2017 Eight-Hour Ozone Moderate Area Plan.

On October 22, 2020, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Evaluation of Proposed PM-10 Certified Street Sweeper Projects for FY 2021 CMAQ Funding; Evaluation of Proposed PM-10 Paving Unpaved Road Projects for FY 2023 and 2024 CMAQ Funding; Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area; and Valley Metro 2020 Transportation Demand Management Survey Results.

Figure 10-1
MAG Regional Air Quality Planning Process



On January 28, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Arizona Thrives Initiative; Draft MAG 2019 Inventory of Unpaved Roads; Update on How COVID-19 is Affecting Traffic and Emissions; Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area; EPA Proposed Approval and Proposed Disapproval of the West Pinal County Moderate Area PM-10 Plan; and Tentative Meeting Schedule for the MAG Air Quality Technical Advisory Committee.

On February 25, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Updated Maricopa County Travel Reduction Program Ordinance and New Telework Plan Option; Funding Available Through DERA FY 21 State Clean Diesel Grant Program; Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area; and Tentative Meeting Schedule for the MAG Air Quality Technical Advisory Committee.

On March 25, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the CMAQ Annual Report; 2021 MAG CMAQ Methodologies; Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area; EPA Proposed Limited Approval and Limited Disapproval on the Arizona Agricultural Best Management Practices Statute and Rules for West Pinal; MAG Air Quality Technical Advisory Committee Vice Chair Vacancy-Letters of Interest; and Valley Bike Month and Spring Kit.

On April 22, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Suggested List of Measures to Reduce PM-10 Particulate Matter in the West Pinal County Nonattainment Area; Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area; Maricopa County Ozone Campaign and Mowing Down Pollution Program; and MAG Air Quality Technical Advisory Committee Vice Chair Vacancy-Letters of Interest.

On August 26, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the EPA Finding of Failure to Submit a State Implementation Plan to Meet the 1987 24-Hour PM-10 Standard Moderate Area Requirements in West Pinal County Arizona; Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area; and Valley Metro 2021 Transportation Demand Management Survey Results.

On September 23, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area and Valley Metro Update on the Share The Ride System and Rideshare Month.

On October 28, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Draft MAG Conformity Analysis for the Draft FY 2022-2025 MAG Transportation Improvement Program and Draft MOMENTUM 2050 MAG Regional

Transportation Plan; Evaluation of Proposed PM-10 Certified Street Sweeper Projects for FY 2022 CMAQ Funding; Evaluation of Proposed PM-10 Paving Unpaved Road Projects for FY 2025 CMAQ Funding; Evaluation of Proposed CMAQ Projects for the Draft FY 2022-2025 MAG Transportation Improvement Program; and Update on the 2022 Serious Area Particulate Plan for PM-10 for the West Pinal County Nonattainment Area.

On December 16, 2021, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Draft MAG 2020 Inventory of Unpaved Roads; Burn Cleaner, Burn Better Winter Air Pollution Campaign; Update on the 2022 Serious Area Particulate Plan for the West Pinal County Nonattainment Area; EPA proposed Rule to Approve the Base Year Emissions Inventory in the MAG 2020 Eight-Hour Ozone Plan-Submittal of Marginal Area Requirements; and the Tentative Meeting Schedule for the MAG Air Quality Technical Advisory Committee.

On February 24, 2022, a meeting of the MAG Air Quality Technical Advisory Committee was conducted to discuss the Update of the Burn Cleaner, Burn Better Winter Air Pollution Campaign and the Update on the 2022 Serious Area Particulate Plan for the West Pinal County Nonattainment Area.

PUBLIC INVOLVEMENT PROCESS FOR TRANSPORTATION AND AIR QUALITY

Federal transportation legislation emphasizes public involvement in the metropolitan transportation planning process. The latest transportation authorization was signed into law on December 4, 2015. This enabling legislation, Fixing America's Surface Transportation Act (FAST Act) continues to emphasize public involvement in the metropolitan transportation planning process. Current legislation requires that the metropolitan planning organization work cooperatively with the state department of transportation and the regional transit operator to provide citizens, affected public agencies, representatives of transportation agency employees, freight shippers, private providers of transportation, representatives of users of public transit, and other interested parties a reasonable opportunity to comment on proposed transportation plans and programs. The Maricopa Association of Governments will continue to adhere to the federal requirements for public involvement, in addition to finding new ways of engaging Valley residents in the transportation planning and programming process.

The MAG Public Participation Plan April 2021 Update indicates that MAG adheres to the many federal requirements for public involvement in transportation planning, which focus on timely public notice, full public access to key decisions, and opportunities for early and continuing involvement in the planning processes. The MAG guiding principles for public participation are: Include a diverse blend of voices in the decision-making process; Engage people early and often in meaningful conversations about the policies and plans that affect the near-term and long-term future of the MAG region; Be clear and transparent in all communications with members of the community; Listen and act by building relationships with members of the community and stakeholders by listening to their ideas and perspectives and incorporating them into the regional plans and projects; and Report

back to people who offer their time and feedback to MAG's planning efforts, and explain how their comments helped shape the final plans.

In accordance with 40 CFR §93.105, consultation is conducted on the draft air quality plans with the State air and transportation agencies, local air quality and transportation agencies, Environmental Protection Agency, Federal Transit Administration, and Federal Highway Administration. Public hearings are conducted on draft air quality plans in accordance with State and federal requirements.

TITLE VI AND ENVIRONMENTAL JUSTICE CONSIDERATIONS

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color and national origin by recipients and sub-recipients of federal funds and prohibits exclusion from participation in, denial of benefits, or being subjected to discrimination under any program or activity receiving federal financial assistance. Additional protections are provided in other federal and state authorities for individuals with limited English proficiency (LEP), income status, religion, sex, disability, sexual orientation, gender, identity, and age.

The Executive Order 12898 on Environmental Justice encourages consideration of environmental justice concerns, especially the impact of programs and activities on low-income and minority populations. The Act and its related laws and directives hereinafter are called, collectively, *Title VI*.

MAG is responsible for incorporating Title VI requirements and environmental justice concerns in its planning and programming processes. For more than fifty years, MAG has fully integrated the voices of vulnerable populations into regional planning activities. The Maricopa Association of Governments is the Metropolitan Planning Organization and Council of Governments for the region, comprising twenty-seven cities and towns within Maricopa County and portions of Pinal County, Maricopa County, Pinal County, the Gila River Indian Community, the Salt River Pima Maricopa Indian Community, Fort McDowell Yavapai Nation, and the Arizona Department of Transportation. A representative from the Regional Public Transportation Authority is a member of the MAG Management Committee. Two Maricopa County State Transportation Board members representing the Arizona Department of Transportation are members of the MAG Regional Council. MAG receives funds from a variety of sources, including direct federal, indirect federal, and state and local government funds.

The MAG Title VI and Environmental Justice Fiscal Year 2022 Program Document was accepted by the MAG Regional Council on May 22, 2021. The document outlines the roles, method of administration, and analysis that supports equity in the Maricopa Association of Governments regional planning.

The MAG Title VI and Environmental Justice Fiscal Year 2022 Program Document describes how data are collected, reported and analyzed for each Program area. For the

environmental area, the document indicates that a robust Title VI Outreach List is used to inform communities of concern and agencies representing the communities when the public is being engaged on environmental quality issues. This includes but is not limited to public hearings when new plans are being developed. The Environmental Division provides public hearing invitation letters to the Title VI stakeholders and other interested parties to solicit input from those targeted and often underserved entities to meet federal requirements. A copy of the public hearing notice published in the newspaper is also provided. A response to comments is prepared for any comments received and then included in the appendix of the plan. The comments and responses are reviewed by the committee before a recommendation is made and are part of the approved plan.

In addition to public hearings, the Environmental Division may engage the public through other activities, including MAG committee meetings, open houses, community meetings, and presentations to local committees. The Environmental Division Title VI liaison works with the MAG Communications staff to develop appropriate outreach plans as needed.

The MAG Title VI Program is implemented through the Title VI Coordinator. The Coordinator is responsible for reviewing and updating the program in collaboration with the division liaisons. The liaisons in each of the MAG divisions are the main point of contact for both the public and Coordinator on Title VI issues.

Information Dissemination

MAG employs a strategy of expanded information dissemination and public access to plans and decisions. Copies of studies and reports are placed in public libraries in the region as standard procedure.

MAG committee meetings are conducted in accordance with the Open Meeting Law, and therefore provide citizens public opportunities to comment before meetings of MAG technical and policy committees. Alternative formats, accessible meeting locations and accessible meeting times are encouraged for MAG meeting planning.

MAG houses numerous records of data, statistics and information. Data collection, analysis and portrayal methods and products are evaluated periodically. Program area managers assess MAG's available data sources for relevance to Title VI requirements not less often than annually.

MAG maintains a home page on the Internet (www.azmag.gov) which provides the public with access to information on the role and history of the agency and its programs, as well as the agendas and minutes of Committee meetings. The web page serves as an excellent portal for disseminating information about MAG events, programs and plans.

11. COMMITMENTS FOR IMPLEMENTATION OF THE 2022 SERIOUS AREA PARTICULATE PLAN FOR PM-10

This chapter summarizes resolutions from the Pinal County Board of Supervisors and the Governor's Agricultural Best Management Practices Committee to implement control strategies above and beyond currently implemented measures to reduce PM-10 emissions across the West Pinal County PM-10 nonattainment area. The resolutions indicate specific commitments to implement various control measures that meet Best Available Control Measures and Most Stringent Measure requirements for Serious PM-10 nonattainment areas. Each jurisdiction determines which measures are feasible for implementation by that jurisdiction.

Under Resolution No. 080421-AQ1, The Pinal County Board of Supervisors has adopted five new measures to further control both activity-based and windblown dust PM-10 emissions from the following sources:

- Construction sites,
- Open areas/vacant lots,
- Unpaved roads,
- Unpaved parking lots, and
- Paved Roads.

Pinal County is authorized under A.R.S. § 49-479 to adopt air pollution control rules and by A.R.S. § 49-480 to establish, administer and enforce an air quality permitting program. The Pinal County Air Pollution Control Officer is also authorized to take enforcement actions set forth in A.R.S. § 49-502, A.R.S. § 49-511, A.R.S. § 49-512 and A.R.S. § 49-513.

The Governor's Agricultural Best Management Practices (Ag BMP) Committee has adopted a resolution to implement measures to control activity-based and windblown dust PM-10 emissions from sources under their jurisdiction as follows:

- Dairies,
- Cattle Concentrated Animal Feeding Operations, and
- Agricultural (cropland) sources.

The Ag BMP Committee has implementation authority for these sources and control measures under A.R.S. § 49-457.

Appendix D, Exhibit 1 contains the resolutions and commitments from the Pinal County board of Supervisors and the Governor's Agricultural Best Management Practices Committee. The commitments contain a description of the measure which will be implemented, the implementation schedule, authority of the entity for implementation, the financial resources necessary to put the measure in place, and the monitoring program designed to track implementation. The commitments document also contains the

measures which jurisdictions found not to be feasible and the corresponding rationale.

Additionally, Appendix D, Exhibit 2 contains amended state statutes regarding the Governor's Agricultural Best Management Practices Committee for submission to EPA for inclusion in the State Implementation Plan. The amended state statutes address concerns raised by EPA in their proposed limited approval/disapproval of the prior state statutes governing emissions of particulate matter from agricultural activity (86 FR 11681).

The Appendix also includes an authenticated copy of The Notice of Final Exempt Rulemaking (NFERM) published in volume 27, issue 48 of the Arizona Administrative Register. This NFERM promulgates the amendments to the Governor's Agricultural Best Management Practices Committee rules necessary to implement the control measures identified in the resolution. The NFERM is being submitted to EPA for inclusion in the State Implementation Plan.